



Tourism of Tomorrow  
Data-Driven Destinations Hub

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## D2.1 Information Needs and Qualifications Report

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# List of Acronyms

Abbreviation / acronym	Description
AR	Augmented Reality
B&C	Business and Customer
C&C	Customer and Customer
DATES	European Data Space for Tourism
DMO	Destination Management Organisation
DRI	Digital Readiness Index
DSFT	Data Space for Tourism
EFTA	European Free Trade Association
ETIS	European Tourism Indicators System
ICT	Information and Communication Technologies
IoT	Internet of Things
KPI	Key Performance Indicator
NGO	Non-Governmental Organisation
SDG	Sustainable Development Goals
SME	Small and medium enterprises
STD	Smart tourism destination
TAF	Technical Assistance Facility
TSA	Tourism Satellite Account
TSI	Tourism Sentiment Index
TTP	Transition Pathway for Tourism
UNWTO MST	United Nations World Tourism Organization's Monitoring Sustainable Tourism
VR	Virtual Reality

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# Executive Summary

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This deliverable describes the data and information needs of European Destination Management Organisations (DMO) and other actors in the European tourism system based upon the results of a baseline analysis (Task 2.1), a review of existing studies (Task 2.2a), two expert consultancy workshops (Task 2.2b) and stakeholder surveys across EU countries (Task 2.2c). It further describes the necessary expert qualifications and skills to be implemented in the pilot phase of the Competence Centre (Task 2.3).

The document outlines the purpose of the deliverable, which is to assess the data and information needs of European Destination Management Organisations (DMOs) and other stakeholders in the tourism sector. This assessment is based on a baseline analysis aimed at creating a comprehensive framework for the establishment of a competence centre for data-driven destination management. The approach included mapping best practices, identifying key stakeholders, and analysing the relevant policy environment.

Additionally, the team reviewed several existing studies from previous projects, which provided valuable insights. These were evaluated through written reports and interviews with the project stakeholders. The findings from these studies informed two expert workshops and a Europe-wide survey, which was conducted in five languages and targeted DMOs and tourism stakeholders. The survey focused on the current state of data usage, needs, and expectations for a European Competence Centre (D3HUB).

Two workshops were organized, one at the NECSTouR General Assembly in Sweden and another specifically dedicated for this purpose online. Lastly, the deliverable outlines the required expert skills for the pilot phase of the competence centre.

The core results of our report come from the empirical phase: We surveyed European destination management organisations (DMOs) and other stakeholders in the European tourism system. 226 answers were collected via a fully structured questionnaire in the period April through June 2024. Additionally, more than 80 active participants were consulted in two workshops in the same period. The study covers DMOs from almost all EU countries, spatial levels and landscape types. Participation was voluntary, and we can assume that participants are more interested in the topic of smart destination management than the average European DMO.

DMOs primarily use official statistics, particularly accommodation data, and online marketing insights. They find learning from best practices, data transparency, and sustainability measurement to be the most useful forms of support. Despite the rising importance of digitalization and data spaces for sustainable tourism, DMOs face challenges due to limited resources, expertise, and data management skills.

Many DMOs are already engaged in data-driven activities, but they require substantial support to further develop these strategies and effectively adopt smart tourism management practices based on these data. GDPR compliance and the preference for public funding for data were also identified as key concerns.

Altogether, empirical results show that the majority of European DMOs in this study are severely restricted in terms of data use and implementation of insights and express a great need for support. The potential self-selection effect in the sample makes the results even more unsettling. With the current level of expertise, DMOs will struggle to participate appropriately in using data to optimize decision-making and to absorb the business opportunities coming from Europe-an Data Spaces—let alone taking an active role.

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The outcome of the document highlights the main findings regarding data and information needs of European Destination Management Organisations (DMOs) and other tourism stakeholders. It shows that existing studies and surveys are often non-specific and not directly useful for DMOs, but the DSFT survey provided valuable insights, particularly on economic and environmental data, which are highly desired but difficult to access. The report underscores the importance of key performance indicators (KPIs) related to tourism's economic impact, visitor flow, and sustainability, with a majority expecting free access to data.

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# 1 Introduction

## 1.1 Purpose of the document

The purpose of this document is to inform project stakeholders about data and information requirements of European DMOs and the required expert qualifications and skills for the first implementation phase (pilot phase) of the European Competence Centre to support data management in tourism destinations.

This deliverable outlines the data and information requirements of European Destination Management Organisations (DMOs) and other stakeholders within the European tourism system. The requirements are, on the one hand, based upon a baseline analysis that had the goal of establishing a comprehensive framework for the implementation and management of a competence centre. To achieve this, we have mapped best practices, identified key stakeholders and analysed the policy framework.

In another step, we also reviewed existing studies. In previous projects, several surveys, workshops and literature reviews provided valuable results for our task. We have identified several projects that promise to contribute to our challenge and evaluated their results through the review of written reports and personal interviews with the authors.

The reviewed existing studies served as the basis for two expert workshops and expert interviews. The D3HUB project team conducted a Europe-wide survey, available in five languages, targeting DMOs and other tourism stakeholders. The survey aimed to assess the current state of data use, data needs, and expectations regarding a European Competence Centre for data-driven destination management (D3HUB). In addition to the survey, two workshops were also organised. The first workshop took place at the NECSTouR conference in Luleå, Sweden, and the second online.

The required expert qualifications and skills to be implemented in the pilot phase of the competence centre are also described.

## 1.2 Structure of the document

This document is structured in six sections, the first being this introduction. Section 2 outlines the results of the baseline analysis, and section 3 the results from a review of existing studies. Sections 4 and 5 report the methodology and results of the two primary data collections within the project, workshops and a survey. Section 6 describes the necessary expert qualifications and skills to be implemented in the pilot phase of the Competence Centre. Section 7 summarises the findings and draws a conclusion on the data and information needs of stakeholders in the European tourism system. Table 1 is an overview of the tasks and the respective chapters of the document that the deliverable covers.

Table 1 Overview of the tasks and the respective chapters of the document

Chapter	Corresponding project task
1. Introduction	No corresponding task
2. Baseline analysis	Task 2.1 – Baseline Analysis
3. Review of existing studies	Task 2.2a – Information needs and data requirements of DMOs and SMEs
4. Empirical results (survey and workshops)	Task 2.2b and c – Information needs and data requirements of DMOs and SMEs
5. Expert qualifications and skills	Task 2.3 – D3HUB pool of experts

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## 2 Baseline analysis

### 2.1 Introduction

The objective of task 2.1 was to establish a comprehensive framework for the implementation and management of a competence centre. To achieve this, we conducted a business model analysis, mapping best practices, identify key stakeholders, and examine the policy framework influencing the development and operation of the competence centre.

### 2.2 Sources

The data initiatives in the tourism sector have been compiled and identified through a variety of sources:

- **Public Data Initiatives:** These have been identified by the [DATES](#) project, specifically from page 14 of [the project report](#), which includes a detailed inventory of data-sharing initiatives. The DATES project focuses on promoting the digital transformation of the tourism industry through enhanced data sharing.
- **Private Data Initiatives and Platforms:** Selected private data initiatives are also included, showcasing the role of private sector companies in contributing to tourism data analysis and dissemination. The initiatives range from global data analytics companies to specialized tourism data platforms. Additional insights are drawn from industry leaders such as [STR](#), [Dexibit](#), [Datappeal](#)<sup>1</sup>, [Mabrian](#) and [ForwardKeys](#). These platforms are at the forefront of tourism data analytics, offering various services, from real-time data monitoring to predictive analytics. The private data initiatives were selected with a thorough search on the internet, knowledge of stakeholders as well as in the DATES project report, already mentioned before.

### 2.3 Data initiatives

Data initiatives in the tourism sector are driven by both public and private funding and focus on leveraging open and statistical data to enhance the industry's overall efficiency and sustainability:

- **Public Funding:** Most data initiatives are funded at the national or regional level, reflecting the public sector's commitment to promoting sustainable tourism through data-driven strategies. These initiatives often focus on the development and dissemination of open data, making it accessible for various stakeholders. Publicly funded initiative include those of National Statistical Offices (NSO), but also Eurostat and UN Tourism (formerly World Tourism Organization).
- **Private Funding:** Private initiatives are often funded through subscriptions, partnerships, and direct sales of data services, focusing on providing value-added services such as predictive analytics, customer behaviour analysis, and market trend forecasting.
- **Global Standards and Frameworks:** International efforts to establish global standards in sustainable tourism are led by UN Tourism, the EU, global frameworks like GSTC and various national agencies, focusing on unified frameworks to guide sustainability policies across regions.
- **UN Tourism's MST Initiative:** The United Nations' Measuring the Sustainability of Tourism (MST) initiative provides a standardized framework to assess tourism's economic, social, and environmental dimensions globally. Developed through collaboration with over 44 countries, MST supports internationally comparable data. It includes core concepts, definitions, and indicators that allow countries to track tourism impacts on sustainability, integrating data across regions and economic sectors.

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- **EU Tourism Dashboard and Eurostat database:** Launched by the European Commission, the EU Tourism Dashboard compiles sustainability indicators under three main pillars: green, digital, and socio-economic. Key metrics include GHG emissions, digital engagement, and employment in tourism, offering data-driven insights to monitor the sector's green and digital transformation. The Dashboard enables EU countries to make policy decisions informed by real-time, comparable tourism data. The dashboard is based upon data from Eurostat's database, which holds additional information and can be accessed independently from the Tourism Dashboard.
- **Technical Support Instrument (TSI) Projects:** The EU's TSI supports Member States in implementing sustainable tourism reforms supported by the OECD. Current projects in Spain, Greece, Croatia, Malta, and Slovenia focus on developing regional indicators that align with national recovery goals. These indicators address governance, economic impact, community engagement, and environmental management, offering a model for sustainable tourism that is locally adaptable yet comparable across regions. One example is the recently (October 2024) published OECD report on *Measuring and Monitoring the Sustainability of Tourism of Tourism at Regional Level in Spain*, providing a system of indicators to measure and monitor the sustainability of tourism.

## 2.4 Mission & Objectives

The primary mission and objectives of these initiatives are to:

- **Promote Sustainable Tourism:** Encourage practices that reduce the environmental impact of tourism while enhancing the economic and social benefits for communities.
- **Enhance Visitor Experience and Satisfaction:** Provide tourists with accurate and timely information, guidance, and personalized services to improve their overall experience.
- **Support Industry Growth:** Aid in the development of the tourism industry by providing data that supports economic growth, business expansion, and innovation.
- **Facilitate B2B Services:** Support businesses in the tourism sector by offering tools to monitor and analyse tourism activity, helping them make informed decisions.
- **Promote Open Data:** Encourage the dissemination of open data to foster transparency, collaboration, and innovation within the industry.
- **Support Green Transition and Resilience:** Align data initiatives with broader goals of promoting a green transition in tourism, building industry resilience, and enhancing skills among stakeholders.
- **Seize Data Opportunities:** Leverage data to explore new opportunities in the tourism sector, such as economic measurements, predictive analytics, and real-time precision in understanding visitor behaviour.

## 2.5 Stakeholders

The stakeholders involved in these initiatives span from local to global levels, encompassing a diverse array of entities that play crucial roles in the tourism sector:

- **Destination Management Organizations (DMOs):** These are key players in managing and promoting destinations. They utilize data to improve tourism management, marketing, and sustainability.
- **Small and Medium Enterprises (SMEs) & Companies:** SMEs benefit from data initiatives by gaining insights into market trends, customer behaviour, and operational efficiencies, which help them compete more effectively.

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- **National/Regional/Local Governments:** Government agencies use data to inform policy decisions, develop tourism strategies, and support economic development at national and regional levels.
- **Researchers and Academia:** Academic institutions and researchers utilize tourism data to conduct studies, develop new methodologies, and contribute to the body of knowledge on tourism dynamics.
- **Global Organizations:** Entities like the United Nations and international tourism bodies rely on these initiatives to gather comprehensive, reliable data that supports global tourism policies and initiatives.
- **Hotel and Hospitality Ecosystem:** Hotels and hospitality businesses use data to optimize operations, improve customer experiences, and predict future trends.
- **Non-Governmental Organizations (NGOs):** can leverage data initiatives to enhance decision-making, impact measurement, and resource efficiency, and collaborative efforts for greater societal impact.

By involving diverse stakeholders, the initiatives can foster a holistic and collaborative approach to tourism development, leveraging a wide range of expertise and perspectives to achieve sustainable and inclusive growth in the sector.

## 2.6 Services & activities

In the ever-evolving tourism sector, a diverse array of services and activities is essential for fostering growth, sustainability, and innovation. The analysed initiatives are designed to enhance the overall travel experience, support local communities, and promote sustainable practices. Below is a comprehensive list of key services and activities that play a crucial role in advancing the tourism industry:

- **Data Management:** Efficient collection, storage, and analysis of tourism data to provide actionable insights.
- **Visitor Information and Guidance:** Providing real-time information to tourists, helping them navigate destinations and enhance their travel experience. Helping destinations and other stakeholders in predicting demand by visualising visitor flows.
- **Marketing and Promotion:** Utilizing data to develop targeted marketing strategies and promote destinations to the right audience.
- **Community Engagement:** Supporting local communities by involving them in tourism planning and ensuring that tourism benefits are equitably distributed.
- **Standardization:** Developing and promoting the adoption of industry standards to ensure data consistency and comparability across different regions and platforms.
- **Innovation Support:** Encouraging the adoption of innovative technologies and practices in tourism through data-driven insights and solutions.
- **Investing in Circularity:** Promoting sustainable practices within the tourism industry by investing in circular economy principles, where resources are reused and waste is minimized.
- **Accessibility and Data Sharing:** Making data accessible to a broader audience, including SMEs, governments, and other stakeholders, to foster collaboration and innovation. Making data more democratized.
- **Trainings and certificates:** Some initiatives offer trainings and certificates for their stakeholders in terms of usage of the data collected and how to make strategies/developments based on historic and real time data.

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- **Predictive Analytics and AI:** Utilizing advanced technologies like artificial intelligence and machine learning to predict trends, analyse visitor behaviour, and optimize tourism strategies.
- **Integration with Other Data Spaces:** Ensuring interoperability with other data ecosystems to provide a more comprehensive view of tourism dynamics.

## 2.7 Value proposition

In general, initiatives empower stakeholders by providing valuable data, fostering collaboration, and driving positive change in the tourism sector:

- **Data Access & Collaboration:** Facilitating access to comprehensive tourism data and promoting collaboration among stakeholders, including integration with other data spaces.
- **User-Friendly Interfaces:** Providing easy-to-use platforms that enable stakeholders to access and interpret tourism data without requiring advanced technical skills.
- **Sustainability & Privacy:** Ensuring that data initiatives align with sustainability goals and prioritize user privacy, especially when dealing with sensitive data.
- **Targeted Audiences:** Offering data services that cater to specific segments of the tourism market, such as outdoor enthusiasts or cyclists, enhancing their travel experiences. Making marketing and promotion easier. Industry specific solutions and analysis of visitor behaviour.
- **Transforming Tourism:** Contributing to the transformation of the tourism industry by providing reliable, internationally comparable data that supports evidence-based decision-making.
- Legal certainty & following the SDGs
- **Economic and Performance Measurement:** Offering tools to define and measure key performance indicators in tourism, allowing stakeholders to optimize resources and improve sustainability.

## 2.8 Funding

Sustainable funding is essential for the data initiatives to thrive, operate effectively, and serve stakeholders efficiently. Funding for these data initiatives comes from a variety of sources:

- **Public Funding:** Many initiatives are supported by national and regional governments, reflecting their commitment to fostering sustainable tourism development.
- **Subscription Models:** Some initiatives are funded through subscription fees, where users pay for access to premium data and analytics services.
- **Donations, Partnerships, and Memberships:** In some cases, funding is provided through partnerships with private sector companies, membership fees from organizations, or donations from stakeholders interested in advancing tourism data initiatives.
- **Revenue from Data Services:** Private initiatives often generate revenue by selling data, services, and analytics to stakeholders, including businesses in the tourism sector.
- **Unknown funding:** A lot of private initiatives are funded with funds, that are unknown to the public.

## 2.9 Key resources

The success of these initiatives depends on several key resources:

- **Tourism Data:** Access to a wide range of tourism-related data, including real-time visitor data, historical trends, and predictive models.

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- **Technology and Platforms:** Advanced technology platforms that support data collection, analysis, and dissemination. This includes APIs for data retrieval, big data analytics, and business intelligence tools.
- **Expertise and Knowledge:** Skilled professionals who can analyse data, interpret trends, and provide actionable insights to stakeholders.
- **Data collected from Wearable Technology and IoT Devices:** Data collected from wearable devices and IoT sensors (GPS), which provide real-time insights into visitor behaviour and preferences.
- **Open and Licensed Data:** Access to open data sources and licensed data sets that enable a broader range of stakeholders to participate in data-driven tourism initiatives.
- **Sentiment Analysis Tools:** Tools that analyse visitor sentiment, providing insights into how tourists perceive destinations and services.
- **Partnership Networks:** Strong networks of partners, including technology providers, academic institutions, and industry associations, which enhance the reach and impact of data initiatives.

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## 3 Review of existing studies

### 3.1 Task description

This chapter is related to subtask a (“review of existing studies”) of Task 2.2 (“information needs and data requirements of DMOs and SMEs”). The results of this subtask feed directly into the subsequent empirical phase, the “expert interviews” (subtask c).

### 3.2 Source identification

#### 3.2.1 Recent projects

In previous projects, several surveys, workshops and literature reviews produced valuable results for our task.

We identified the projects in Table 2 and assessed their results through examination of written reports and personal discussions with the authors. We are aware, that more projects exist, but we tried to identify those promising some input to our problem. Others, like MEDS Smart Destinations, only just started and may produce relevant content in the future.

Table 2 Recent projects relevant for this study

Project Title	Year(s)	Webinfo
Sustainable EU Tourism – Shaping the Tourism of Tomorrow	2024	<a href="https://single-market-economy.ec.europa.eu/sectors/tourism/eu-tourism-transition/sustainable-eu-tourism-shaping-tourism-tomorrow_en">https://single-market-economy.ec.europa.eu/sectors/tourism/eu-tourism-transition/sustainable-eu-tourism-shaping-tourism-tomorrow_en</a>
DATES, European Data Space for Tourism (SEDIA Project ID 101084007)	2022/2023	<a href="http://www.tourismdataspace-csa.eu">www.tourismdataspace-csa.eu</a>
DSFT, Data Space for Tourism (DIGITAL-2021-PREPACT, SEDIA Project ID 101083920)	2022/2023	
Crisis Management and Governance in Tourism	2022/2023	<a href="http://eisma.ec.europa.eu/crisis-management-and-governance-tourism_en">eisma.ec.europa.eu/crisis-management-and-governance-tourism_en</a>
Tourbit DRI	2022/2024	<a href="http://tourbit.eu">tourbit.eu</a>
Smart Tourism Destinations	2021/2023	<a href="http://smartrtourismdestinations.eu">smartrtourismdestinations.eu</a>
TTP Transition Pathway for Tourism	2021/2022	EC DG GROW
Tourism of Tomorrow Lab	2020	<a href="http://necstour.eu/tourism-tomorrow-lab">necstour.eu/tourism-tomorrow-lab</a>
Selected national examples : Germany: Self Check Smart Destination	2024	<a href="http://tourismusverband.nrw/strategie/smart-destination">tourismusverband.nrw/strategie/smart-destination</a>

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• Germany: DMO DigitalMonitor	2024	<a href="http://www.bte-tourismus.de/dmo-digital-monitor/">www.bte-tourismus.de/dmo-digital-monitor/</a>
• Germany: TN Survey 2024	2024	
• Italy: Analysis of Italian Destination Management Organisations for the definition of ENIT's new strategic framework	2024	<a href="#">Analisi delle DMO italiane per la definizione del nuovo quadro strategico di ENIT</a>
• Austria: Regionales Informations- und Monitoringsysteme in Tourismusregionen (RESY)	2023/2024	<a href="https://www.resy-dashboard.at/">https://www.resy-dashboard.at/</a>
• CIDAI, Centre of Innovation for Data tech and Artificial Intelligence		<a href="https://cidai.eu/en/">https://cidai.eu/en/</a>
• ICTUCAT. INTUCAT		<a href="https://empresa.gencat.cat/ca/treball/ambits_actuacio/turisme/coneixement_planificacio/estadistiques-turistiques/indicadors-turistics-ictucat-intucat/index.html">https://empresa.gencat.cat/ca/treball/ambits_actuacio/turisme/coneixement_planificacio/estadistiques-turistiques/indicadors-turistics-ictucat-intucat/index.html</a>
• SEGITTUR		<a href="https://www.segittur.es/en/">https://www.segittur.es/en/</a>

Source: Authors

### 3.2.2 Academic literature

In addition to the project results, we looked at academic literature from the last five years on the topic of smart tourism destinations. We scanned the relevant tourism journals within Scopus CiteScore with the subject “Tourism, Leisure and hospitality Management” for search terms (“smart tourism” OR “smart destination”) AND (“stakeholder” OR “survey”) and analysed the abstracts for the expectable presence of empirical results in the paper.

Already in 2020, Baggio et al. identified 147 papers in the SCOPUS database and found:

“However, the existing literature suffers from a lack of empirical studies aimed to investigate to what extent an STD [smart tourism destination] is smart because of a relevant injection of various types of technologies that theoretically should enable B2B, B&C and C&C relationships or whether, and better, is smart because it builds first, or simultaneously, an effective environment that can be supported and echoed by technology. This study was therefore carried out to contribute filling this research gap by applying a network analytical approach to the physical and digital components of three tourism destinations.” (Baggio et al., 2020, p. 411).

In our research, we focussed on those papers which promised to inform the empirical phase of our project in task 2.2b. Nine papers qualified for assessment (Chen et al., 2023; Gelter et al., 2022; Ivars-Baidal et al., 2019, 2024; Pesce et al., 2019; Shafiee et al., 2021; Sun et al., 2022; Ye et al., 2021; Zvaigzne et al., 2023).

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Another three papers (Crabolu et al., 2023; Font et al., 2023; Ivars-Baidal et al., 2023) touched the topic of sustainability indicators, which might be informative for subsequent tasks in the D3HUB project. However, these papers were not analysed here.

### 3.3 Results from recent projects

This section holds the results from the previously identified projects.

#### 3.3.1 DSFT Preparations for the Data Space for Tourism

DSFT Data Space for Tourism was one of two preparatory actions for the Data Space for Tourism. The project was implemented by Modul University (AT-Vienna), CITYDNA–City Destinations Alliance (FR-Dijon), ETC–European Travel Commission (BE-Brussels) and Forward Data SL (ES-Valencia). It resulted in a Blueprint document together with its sister project, DATES.

We identified two deliverables from the project directly relevant for our study:

- D2.2 Tourism Data Inventory and Stakeholder Questionnaire - Summary Report, containing results from a structured survey among tourism stakeholders in Europe;
- D3.5 Report on Requirements for Sustainable DSFT (ideal business and governance models), containing results from interactive workshops.

The results from the two reports are discussed in the subsequent sections:

- **D2.2 Tourism Data Inventory and Stakeholder Questionnaire**

*Base document: Data Space for Tourism, 2023. Preparatory Actions for the Data Space for Tourism: Tourism Data Inventory and Stakeholder Questionnaire - Summary Report.*

This report firstly contains an analysis of the Tourism Data Inventory (TDI). Major tasks included a desk review and creation of a comprehensive inventory of existing data repositories and platforms sharing data relevant to tourism stakeholders. All data sources were classified to understand availability based on the type of information needed by European tourism stakeholders (e.g., data themes, data scope, and data frequency rates). Information on 810 data sources was gathered and evaluated from the 30 EEA countries (27 EU and 3 EFTA countries). Details of the results are given in Table 3. It is noteworthy that data on the economic impact of tourism in destinations is by far the most often used data theme (77%). Annual processed data seem to be the standard data frequency and abstraction level. Only 4% of cases are “raw data” (microdata). This might indicate a weak presence of data analysis skills in the domain (these skills are necessary to process microdata and gain abstractions and insights from them).

The second part of the report is more relevant for our project. It covers an online survey among tourism stakeholders throughout Europe. Data collection was done in January 2023 through an online questionnaire with 209 responses. DMO have the largest share (26 %), the rest is private enterprises, private associations, PPP, government authorities, research organisations and NGO.

Given the heterogeneity of respondents, due to the objective of the project the report mostly only summarises figures without revealing structural differences between groups (one exception is the SME group)

Authors claim a response rate of 78% and consider their results to be “representative of European tourism stakeholders based upon operational scope, organisation type, and number of employees” (p. 20). These claims seem to be only weakly substantiated, if at all (the response rate is based upon a voluntary pre-registration and the universe of stakeholders is unknown).

A key finding, which made it into the final project report, is the Data Themes section. The report shows that environmental impact and economic impact of tourism have highest value and priority, with environmental impact data being much less accessible and analysable.

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Table 3 Perceptions for each theme of tourism data (means and standard deviations ( $\sigma$ )), n=201

	Human Capital		Natural Capital		Built Capital		Economic/ Social Capital		Environmental Impact		Economic Impact		Social Impact	
	Mean	$\sigma$	Mean	$\sigma$	Mean	$\sigma$	Mean	$\sigma$	Mean	$\sigma$	Mean	$\sigma$	Mean	$\sigma$
Value	0.83	1.05	0.45	1.20	0.83	0.97	1.09	0.85	1.24	0.83	1.49	0.74	1.25	0.84
Priority	0.66	1.11	0.36	1.20	0.61	1.09	0.82	0.97	1.17	0.92	1.44	0.75	1.23	0.90
Access	-0.47	1.14	-0.03	1.25	-0.21	1.23	-0.53	1.13	-0.88	0.92	-0.05	1.24	-0.41	1.17
Analysable	-0.04	1.06	0.00	1.20	0.13	1.14	-0.04	1.10	-0.39	1.15	0.44	1.09	0.27	1.16
Shareable	-0.04	1.13	0.35	1.17	0.22	1.15	0.03	1.14	0.08	1.22	0.39	1.20	0.40	1.18

Scale: -2 (strongly negative) ... +2 (strongly positive), p. 21

### • D3.5: Requirements for Sustainable DSFT

*Base document: Data Space for Tourism, 2023. Preparatory Actions for the Data Space for Tourism: Requirements for a Sustainable DSFT - D 3.5 Report on Requirements for Sustainable DSFT (ideal business and governance models).*

In this document, the project team reports on the results of four interactive workshops in Vienna, Rome, Brussels and Vilnius in March and April 2023. Altogether, 42 representatives of different stakeholder groups participated. The workshops used Lego Serious Play (LSP) as a tool (in the report, it is mentioned as a “method” rather than a tool). The workshop results are narratives on the DSFT vision and do not contribute relevant information to data and information needs.

In the second part the team reports on a two-round Delphi study with 81 in the first and 55 respondents in the second round. Main findings are, that the main expectations towards a European Data Space for Tourism are a Europe wide benchmarking and the facilitation of knowledge sharing.

Most important features are access to up-to-date data and ease-of-use, most expected motivations would be the provision of dashboards and data visualisations and, again, facilitation of knowledge sharing and maintaining transparency would be the most important data quality topic. In terms of governance, most respondents expect that the Data Space will be managed and financed by the EU. Asked for possible use cases for a Data Space, respondents mention trend analysis, information on visitor profiles and visitor behaviour and information for better decision making (which seems to be a quite generic term in the context of destination management).

### 3.3.2 DATES European Data Space for Tourism

DATES European Data Space for Tourism was one of two preparatory actions for the Data Space for Tourism. The project was implemented by 13 project partners under the lead of AnySolution S.L. (ES-Palma) having among its partners NECSTOUR, Arctur, Intellera, Tecnalía, DIH 4.0, Outdooractive, Italian Ministry of Tourism, IDC, Amadeus, ANewGovernance, IDSA and AVORIS. It received funding from the Digital Europe Programme under Grant Agreement No. 101084007 and ran from November 2022 through October 2023. It resulted in a Blueprint document together with its sister project, DSFT.

We identified four deliverables from the project directly relevant for our study:

- D2.1 Data Sharing Initiatives Inventory, an inventory of 194 initiatives
- D2.2 Analysis of Gaps and Overlaps, based on an online workshop with 207 participants
- D2.3 Identification of data typology and priority list of datasets, potential cases and common building blocks with other data spaces
- D3.3 Blueprint and Roadmap for Deploying the European Tourism Data Space - Final Draft 3.0

The results from the four reports are discussed in the subsequent sections:

### • D2.1 Data Sharing Initiatives Inventory

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*Base document: European Data Space for Tourism, 2023. Deliverable 2.1 - Data Sharing Initiatives Inventory. Available at: <https://www.tourismdataspace-csa.eu/wp-content/uploads/2023/10/DATES-D2.1-Data-sharing-initiatives-inventory-DEF.pdf>*

The project team mapped 194 data sharing initiatives, 36 of which were identified through a survey. According to the aims of the survey, the range of categories of stakeholders targeted by the survey was intentionally wide. Respondents represented small and medium enterprises (SMEs), start-ups, as well as large for-profit companies active in the sector; both central and local public authorities; NGOs and not-for-profit organizations; and research institutions and universities.

Interestingly, all three categories (data purposes, data sources, data information) do not allow to identify a top and low group. Rather, all categories are more or less evenly distributed. Only when it comes to missed data information in data sharing initiatives, data on demand and supply, on sustainability, mobility and tourist behaviour stand out a little.

This report also contains the survey methodology used to identify further data sharing initiatives. The survey had two main sections, “(i) gaining insights on relevant data sharing initiatives that could have been missed during the desk research activities and (ii) exploring which data are needed in the tourism sector” (p. 11).

## • D2.2 Analysis of Gaps and Overlaps

*Base document: European Data Space for Tourism, 2023. Towards a data space for tourism. Available at: <https://www.tourismdataspace-csa.eu/event/towards-a-data-space-for-tourism-prioritization-of-data-needs-and-purposes/> and [https://www.tourismdataspace-csa.eu/wp-content/uploads/2023/09/DATES-D2.2-Analysis-of-gaps-and-overlaps\\_v2.1.pdf](https://www.tourismdataspace-csa.eu/wp-content/uploads/2023/09/DATES-D2.2-Analysis-of-gaps-and-overlaps_v2.1.pdf)*

This report contains a cluster analysis of the 194 initiatives identified in DATES D2.1 (see previous section).

For the gaps and overlaps analysis, the project team implemented a large online workshop which took place on February 8, 2023. 207 participants attended the event. It is worth mentioning that the workshop participants covered several categories of stakeholders, ranging from destination management organizations to consulting firms and public authorities. Accordingly, the participants were distributed in a way that the same proportion of each stakeholder’s category was present in each break-out room. In each room, a number of five to eight challenges was presented and participants were asked to discuss the “type of data that are most useful to solve the challenge”. The room topics were taken from question 7 of the survey (see below: Improvement of the interaction and engagement of the tourist, Conduct market analyses and inform decision-making, Improvement of planning and operations of tourism services, Increase of destination sustainability and accessibility). Results show that “the three most important data to be shared in the tourism sector are the ones regarding tourists’ behaviour, mobility data and demand and offer data” (p. 36). However, the spread of responses is so large that again it is impossible to identify a set of top or low value items. It rather seems that participants have quite divergent views on what data types are suitable to solve their problems.

The survey mentioned in the previous section has three immediately relevant questions in the section on tourism sector’s data needs:

- Q7: For which of the following purposes is data exchange most needed in the tourism sector? (Improvement of the interaction and engagement of the tourist, Conduct market analyses and inform decision-making, Improvement of planning and operations of tourism services, Increase of destination sustainability and accessibility)
- Q8: Which of the following types of data you think are the most important to be exchanged in the tourism sector? (User-generated data, Transaction data, Device data)
- Q9: Which of the following information about tourism are the most important for you? (Typology of tourists, Behaviour of tourists, Mobility in the destination, Purchase habits,

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Nationality of the tourist, Demand and offer data, Pricing comparison, Benchmark with other destinations)

The document reports the results according to the data initiatives mapping.

Figure 1 Initiatives per data purpose (cf. Q7)

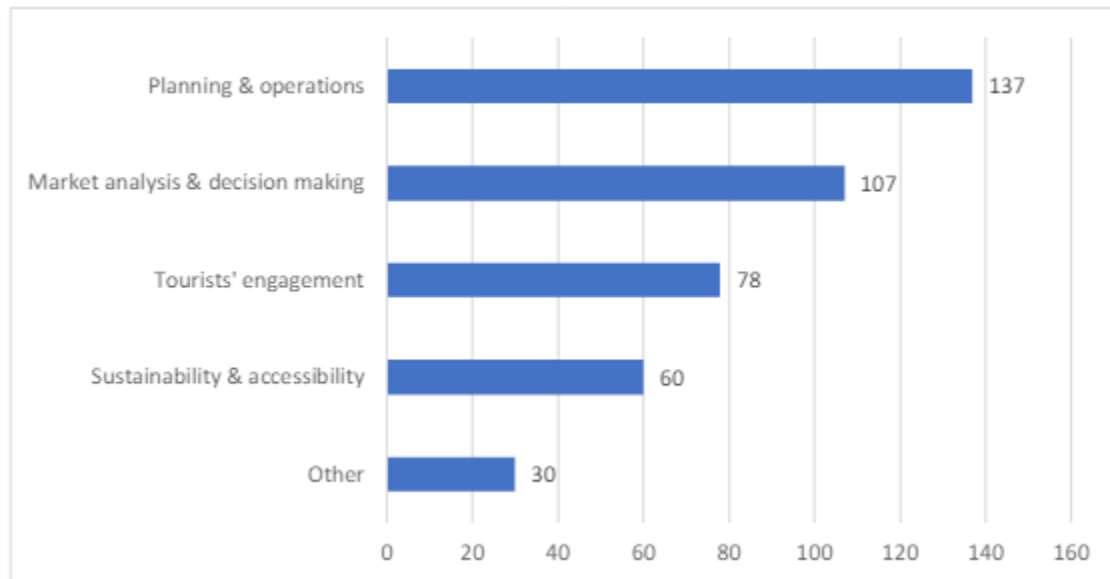
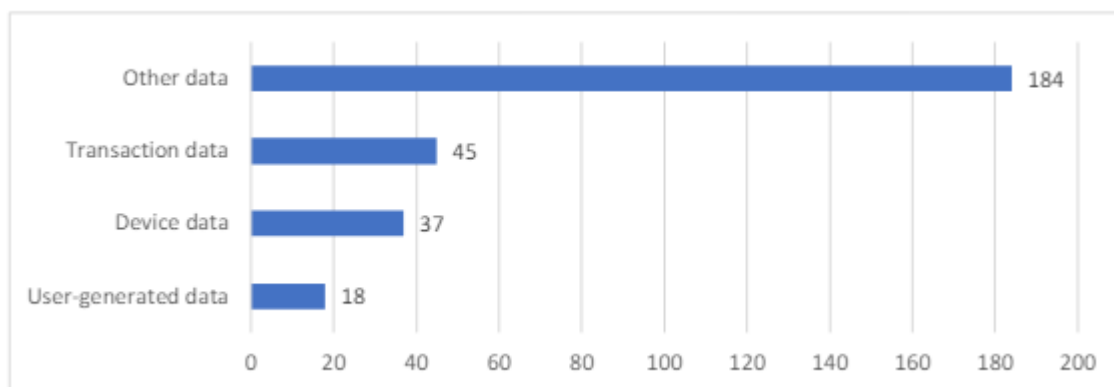


Figure 2 Initiatives by data source (cf. Q8)



### • D2.3 Potential Use Cases

*Base document: European Data Space for Tourism, 2023. Deliverable 2.3 - Identification of data typology and priority list of datasets, potential cases and common building blocks with other data spaces. Available at: <https://www.tourismdataspace-csa.eu/wp-content/uploads/2023/11/DATES-D2.3-Identification-of-data-typology-and-priority-list...V1.1.pdf>*

To develop the use cases, the Project Team relied on most of the evidence collected through the above-mentioned activities and the results presented in deliverables D2.1 Data sharing initiatives inventory and D2.2 Analysis of gaps and overlaps. Two for each of the four data purposes, based on the prioritized challenges identified during the February workshop.

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### 3.3.3 DSFT/DATES summary and conjoint experiment

*Base document: European Data Space for Tourism, 2023. Blueprint and Roadmap for Deploying the European Tourism Data Space - Final Draft 3.0. Available at: [https://www.tourismdataspace-csa.eu/wp-content/uploads/2024/01/DRAFT-BLUEPRINT-Tourism-Data-Space-v3.3\\_final.pdf](https://www.tourismdataspace-csa.eu/wp-content/uploads/2024/01/DRAFT-BLUEPRINT-Tourism-Data-Space-v3.3_final.pdf)*

The Blueprint report is the final deliverable report from both projects, DSFT and DATES. It has a chapter (3.2) on Data Sharing Needs of European Tourism Stakeholders. Besides the thematic perceptions taken from DSFT D2.2 (Table 3) it summarises that “data that are accessible are often incomplete, not interoperable, and not timely updated” and that “availability of time and financial resources, insufficient data analytics skills among the tourism workforce and the lack of the sector’s cooperation and collaboration regarding data sharing are considered to be significant limitations for both data analysis and data sharing” (p. 18). At the same time, the report states a “lack of maturity” (p. 19) when it comes to the ability of stakeholders to organise their data sharing ecosystem. GDPR regulations are a major concern.

In Appendix A of the document the authors report on the results of a convenience sample of 392 stakeholders (48% private enterprises, 13% DMOs). The respondents were asked questions relating to governance structures, revenue models and governing bodies. The authors computed part-worth utilities from a conjoint model. It shows that public funding has higher utility than private funding (p. 32).

### 3.3.4 Smart Tourism Destinations

*Base document: European Commission (Ed); Galasso, G., Montino, C., Sidoti, A. et al., 2022. Study on mastering data for tourism by EU destinations – Main text. Doi:10.2873/23880.*

The Study on Mastering data for tourism by EU destinations is a report prepared in 2022 for the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission (DG GROW). It was authored by a team from PriceWaterhouseCoopers (PwC), Intellera Consulting (IT-Rome), Carsa (ES-Getxo) and the University of Málaga (ES). It was prepared in the framework of the Smart Tourism Destinations project. The project received funding from the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission (DG GROW). The main text is accompanied by a methodological appendix and an executive summary.

Through desk-based research and interviews with experts in the field, the study has collected 200 cases of data use for tourism in many EU destinations. 50 of 334 stakeholders for the mapping were DMOs. An integrated program coordinator of a DMO was included in the list of experts for the interviews. Analysis followed three dimensions (“What are the purposes of making use of data for tourism?”, “Who are key data users?”, “What are key data sources?”).

Unfortunately, the authors do not evaluate the dimensions by importance or volume. Instead, they offer use cases for each of the purpose areas. Therefore, we can conclude that each of the purpose areas really exist (because there are real world use cases to be identified), but we cannot deduct any further information on these purpose areas.

### 3.3.5 Tourbit

The Tourbit (Fostering digitalisation of European tourism SMEs) project received funding from EISMEA. Eight partners work on the objectives of “fostering skills and capacity and boosting the uptake of digitalisation and innovation, promoting resilient and competitive SMEs and spurring a faster transformation of the European tourism sector.” The project started in January 2022 and will work until June 2024.

One achievement of the project was the implementation of a digital readiness index (DRI). Although this collection is not based on empirical data from stakeholders, it reflects the expert opinion of the

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authors of what qualifies a destination to be data-driven or smart. Therefore, it might be useful to have a look at the tool, which is available online at <https://dri.aat4.eu/>.

The DRI questions are not tourism specific, but rather oriented towards application in a broad variety of industries.

### 3.3.6 TTP Transition Pathway for Tourism

The Transition Pathway for Tourism (TTP) was a co-creation process initiated by the European Commission. It builds upon the Commission's industrial strategy (2020) and the experiences from the COVID-19 pandemic. It became clear that the tourism industry faces major challenges to achieve the green and digital transitions (European Commission DG GROW, 2022, p. 1).

Within the process, an online survey of "almost 200 stakeholders from 24 EU Member States plus Norway and the UK" was implemented. The survey questionnaire and the results were published online and are accessible through the TTP website

Of the 185 respondents, only 7 were from DMOs, while the largest groups were formed by business associations and organisations (61) and administrations on local, regional and national level (57). There is no further information on how the potential participants were identified and invited to the survey.

The survey touched three topics, resilience, green transformation and digital transition. Barbara Neuhofer was responsible for the digital transition part. In the questionnaire, the digital innovation part consisted of five open-ended questions (2000 characters maximum). Respondents were asked to consult section 2.3.1 of the staff workings document before answering this section.

As part of the transition pathway co-creation consultation process with stakeholders across the tourism ecosystem and the EU Member States, it is relevant the report by Neuhofer, B., Font, X., Crabol, G., & Koens, K. (2022). Stakeholder Consultation Report (GRO-SME-10-C-081a-c. <https://ec.europa.eu/docsroom/documents/48595/attachments/1/translations/en/renditions/pdf>

The report (the section on digital transformation covers pp. 39–58 of the reference document) does not give any methodological information as to the data analysis procedures employed (like text analysis, top-down or bottom-up categorisations, etc.). The report does not give any quantified information but provides long lists of bullet points, assumedly verbatims from the responses to the open-ended questions. There is no breakdown of answers by target group ("participant's organisation").

For the first question, the report identifies four topics (it remains obscure, however, whether these topics emerged from the text-corpus or were superimposed to the material):

1. Data analytics and real-time experience management
2. Digitalisation of never-ending tourism and virtual experiences
3. Technology empowered destinations and transforming value co-creation
4. Digital empowerment and knowledge of tourism providers and consumers

A major drawback of the report is that the results do not allow for a transparent assessment of importance or relevance of the respondent's statements. Therefore, it is impossible to draw relevant conclusions for our project.

### 3.3.7 Crisis Management and Governance in Tourism

*Base document: Deloitte/European Commission: D1.3 Analysis on key data elements and sources for tourism authorities and stakeholders. EISMEA/2022/OP/0011: Crisis Management and Governance in Tourism. June 2023.*

*Deloitte/European Commission: D1.5 Recommendations. EISMEA/2022/OP/0011: Crisis Management and Governance in Tourism. September 2023.*

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Crisis Management and Governance in Tourism is a project within the Single Market Programme handled by EISMEA. It will serve Assistance Service Packages to at least 50 destinations and 55 cross-border professional associations.

The project team implemented a survey covering, among other topics, the data needs in the context of crisis management (Table 4). The survey collected open-ended answers from a convenience sample of 38 participants, the original questionnaire is still available online. From the 38 answers, 41% (n = 16) came from national or regional tourism organisations, the remainder distributed over six other categories.

In the context of crisis management, two thirds of respondents “value real-time monitoring for optimal crisis management”. However, it remains obscure what kind of data shall be monitored. Also, when asked for the desired frequency for data updates during crisis time, only 24% answer “real-time”, while 34% answer monthly or less frequent.

The most prominent data sources during the COVID crisis were government websites, plus data from UNWTO and IATA.

Due to the very small number of respondents and the clear focus on handling crises (exemplified by the COVID 19 crisis), results are only of limited value for our study.

Table 4 : Domain in the survey

Domain 1	Data needs	Data required to optimally manage a crisis (e.g. for forecasting, scenario planning, real-time monitoring, decision making)
Domain 2	Data sources	The data sources consulted during the COVID-19 pandemic, which proved to be useful to navigate the crisis
Domain 3	Data sharing	How organisations from the tourism industry can benefit from one another by sharing their respective data
Domain 4	Data indicators	Key indicators monitored during the COVID-19 crisis
Domain 5	Data frequency preferences	Frequency of data updates necessary to improve the quality of decisions made and their mitigation
Domain 6	Data trustworthiness	Level of data trustworthiness needed for optimal decisions vis-à-vis the actual accuracy of available data
Domain 7	Data gaps	Data gaps identified and how they were potentially addressed
Domain 8	Data processing	Methods and/or tools/applications used to collect, analyse and interpret data in the context of the COVID-19 crisis

### 3.3.8 Sustainable EU Tourism – Shaping the Tourism of Tomorrow

Intellera/Scholz&Friends/European Commission

The “Sustainable EU Tourism – Shaping the Tourism of Tomorrow” project (that will run from 2023 to 2025) provides support to EU tourism destinations as they navigate towards greater sustainability and resilience, through the identification of challenges and best practices and workshops for the exchange of information and experiences.

The project deliverable identified 31 key challenges faced by destinations, their main contributing factors and stakeholders affected, as well as 50 case studies presenting best practice solutions in different spatial contexts (from urban to rural and from coastal to mountainous), including a set of replicable solutions and recommendations on how to successfully respond to different types of tourism-related challenges.

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Half of the destinations analysed in the case studies have adopted innovative digital solutions to advance sustainable and resilient tourism. Key digital tools include mobile apps for tourism services, which are used in 15 destinations to provide real-time information on transportation, attractions, and eco-friendly options, thereby enhancing visitor navigation and promoting sustainable mobility. For instance, Florence's "FeelFlorence" app helps manage tourist flows and suggest less crowded attractions, while Brussels' app Floya integrates various transport modes for a seamless travel experience.

Real-time data and monitoring systems are also prevalent, utilized in destinations like Barcelona and Malta to optimize tourism flows and resource management. These systems, such as the Smart Data platform in Andalusia and the Tourism Observatory in Barcelona, aggregate data to support sustainable tourism planning and decision-making. Additionally, digital tools for environmental monitoring, mobility solutions, and augmented reality (AR) are employed to assess and manage environmental impacts, promote sustainable transport, and enrich tourist experiences. AR tools offer immersive experiences by blending digital elements with real-world sights, enhancing cultural and historical engagement.

The report concludes that, overall, digital innovations play a crucial role in balancing tourism growth with sustainability and improving both visitor experiences and operational efficiency.

### 3.3.9 Tourism of Tomorrow Lab

From S3 Partnership to Tourism of Tomorrow Lab

Since 2017, a European public-private partnership involving regions, destinations, tech providers, and travel companies collaborated on the "Digitalisation and Safety for Tourism" S3 Platform—a Smart Specialisation initiative by the European Commission. S3 supports research-driven growth by connecting regions and industries through tailored innovation strategies. The Tourism of Tomorrow (ToT) Lab emerged from this partnership, benefiting from the Technical Assistance Facility (TAF) for support in developing a market-ready business model and operational structure.

#### Establishing the ToT Lab

With an initial 15-day TAF allocation, ToT Lab received guidance on business structuring, market validation, UVP definition, and financial planning. This support included legal consultations on data access and operational scope. Additional TAF support later allowed ToT to finalize its services, governance, and financial model while aligning processes with organizational goals.

#### Operational Launch and Impact

Starting in January 2022, ToT Lab adopted a fee-based model, delivering value to partners through consulting and collaborative initiatives rather than set products. A key success has been the Technical Support Instrument (TSI), a collective effort that supports destinations in monitoring the sustainability of tourism, funded by the European Commission (DG Reform).

#### Organizational Structure and Partner Engagement

ToT Lab operates as a unit within NECSTouR, offering efficiency and flexibility without establishing an independent legal entity. Partner regions contribute funds and staff resources, which, along with collaboration and best practices exchange, has built credibility and attracted additional support..

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### 3.3.10 i-TAG

The project i-TAG, International Tourism Analytics Group: Enhanced Data and Statistical Literacy for Sustainable Tourism Development, will establish an international network among EU higher education institutions (HEIs) for increasing statistical literacy in the tourism and hospitality field. It is funded by European Education and Culture Executive Agency (EACEA) under project number 2023-1-IT02-KA220-HED-000154801. Results are currently being researched.

### 3.3.11 Selected National examples

- **Germany: Self Check Smart Destinations**

Tourismus NRW e. V. (Ed.). (2022). *Leitfaden Smart Destination*. [https://tourismusverband.nrw/\\_Resources/Persistent/6/5/3/e/653e051d6ca7ebfecc40b7920b50d747516d9a29/Smart-Destination\\_Leitfaden\\_TourismusNRWe.V.pdf](https://tourismusverband.nrw/_Resources/Persistent/6/5/3/e/653e051d6ca7ebfecc40b7920b50d747516d9a29/Smart-Destination_Leitfaden_TourismusNRWe.V.pdf)

The Self check Smart Destinations was commissioned by Tourismus NRW, the state tourism organisation of Northrhine-Westphalia. The basics are documented in the reference document (*Leitfaden Smart Destination – Guidebook Smart Destination*, German only). The tool was implemented by Eric Horster after consultations with regional and local DMOs in the state.

A tourism destination specific self-assessment tool can be found – in German language only – at <https://tourismusverband.nrw/wissen/self-checks>. It has four sections: data infrastructure, digital applications, digital equipment and smart DMO. Four of the topics are similar in all categories.

- **Germany: DMO DigitalMonitor**

The DMO Digital Monitor is a survey implemented by the consulting firm BTE and sponsored by the German Tourism Association, DTV (Deutscher Tourismusverband e.V.). It was published three times, 2019, 2021 and 2023. It is a commercial project; therefore only limited information is available. In 2023, the survey collected 483 completes from DMOs (which is much more than any of the European projects analysed has ever accomplished).

We used the brief results available online as background information for the questionnaire design in D3HUB.

- **Germany: TN Survey**

**TourismusNews Deutschland, 2024. Umfrage Datenmanagement. Available at:** [https://docs.google.com/forms/d/e/1FAIpQLSezLlOKTo2pu1SPH0AH8Wi\\_GwG5YjuGy7QN6lQmK\\_IsYpDeAQ/viewform](https://docs.google.com/forms/d/e/1FAIpQLSezLlOKTo2pu1SPH0AH8Wi_GwG5YjuGy7QN6lQmK_IsYpDeAQ/viewform)

60 DMOW responded to the survey initiated by one of the industry newsletters, TN Deutschland. Here is a translation of the press release:

“Data management: Only just under a third maintain all data openly

Almost 60 destinations took part in our TN Germany survey on the topic of data management and Open. Almost a third (30.4%) of participants stated that they actually openly licensed all data sets. Just over half (51.8%) only do this with new data sets. The most important criterion for a good database system for virtually all users (94.7%) is that data only has to be maintained once but then updated on all channels. It is also of fundamental importance that the data is automatically visible on many channels (75.4%). The main motivation for collecting data centrally is marketing (84.2%), with data quality and timeliness being the biggest challenge for most DMOs (91.2%). The majority of respondents (96.3%) hope that advances in AI technology will bring great potential for their database work in the future. 82.1 percent of survey participants were “satisfied” or even “very satisfied” with their database solution. However, almost a fifth (17.9%) are dissatisfied with their current technology provider.” (Automatic translation)

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- **Italy: Analysis of Italian Destination Management Organisations for Defining ENIT's New Strategic Framework**

This research-intervention project aims to assess the profiles of Destination Management Organizations (DMOs) and other entities overseeing Italy's major tourist destinations, as well as to identify priority collaboration areas with ENIT. Additionally, the project aims to draft strategic guidelines for ENIT, aligned with the repositioning outlined by the Ministry of Tourism Agreement for the 2022-2024 triennium, and incorporated into the Ministry's strategic plan.

To achieve these objectives, the project undertook:

1. A comprehensive mapping of the strategic, organizational, and management profiles of Italy's key DMOs (covering 185 DMOs at regional, area, and urban levels) through desk research, regional strategic plans, a survey targeting DMO directors, in-depth interviews, and focus groups.
2. An analysis of DMO satisfaction with ENIT's past activities, alongside an exploration of the needs in skills, resources, and policies where ENIT could serve as a future strategic partner.

The study identified four primary needs areas for DMOs: (i) market knowledge, (ii) market oversight and promotion, (iii) product innovation, and (iv) development of managerial expertise.

Regarding the survey, particular attention is drawn to the themes of data analysis. Specifically, in reference to the future development of DMO activities, 92% of respondents consider the area of expertise related to data analysis to be highly relevant. In addition, 40% of the responding DMOs indicated that they find it difficult to find skills related to data analysis in the labor market. This is a strategic area of development that has become the foundation for any future initiative aimed at fostering robust decision-making processes. In particular, the survey highlights a potential skills shortage in the field of data analysis, which will challenge DMOs to position themselves in the market as attractive employers with effective employer branding and employee retention strategies, offering a high-quality employee experience.

- **Austria: Regionale Informations- und Monitoringsysteme in Tourismusregionen (RESY)**

RESY is a system of regional information and monitoring systems in Austria. the National administration had selected two pilot regions in 2023 to set up an information dashboard for regional DMOs. The RESY dashboard was published in June 2024 and is available at <https://www.resy-dashboard.at/>

The project website states that RESY „helps with evidence-based management in the regions, as it facilitates access to selected indicators from official statistics and other publicly available data. The RESY dashboard can be used to open up discussion spaces and strengthen cross-sectoral cooperation. It offers a total of 30 indicators in five key thematic areas for around 600 regions and 2093 municipalities.

- **Spain: CIDAI, Centre of Innovation for Data tech and Artificial Intelligence**

CIDAI promotes the transfer of knowledge and the realization of joint projects between knowledge-generating entities (universities, research and innovation centres), companies providing technology and services, and companies and user institutions demanding innovative applied artificial intelligence solutions. CIDAI is one of the four pillars of the Artificial Intelligence Strategy of Catalonia, a strategy that establishes the priorities and lines of action to turn Catalonia into a pole of innovation, leadership and attraction of talent and companies in the field of artificial intelligence.

In the field of tourism, CIDAI has published the results of the following projects:

Bank transactions: main indicators of for all tourism brands in Catalonia. Expenditure indicators, number of visits and flows between destinations are included, calculated from bank transactions. The results are segmented by overnight visitors, excursionists, consumed business category, nights of stay, repeat visits and origin of the consumer.

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Exploring sentiment data: results of the main indicators of online surveys realised to all the tourist brands of Catalonia. Indicators of valuations, sentiment, frequency of key phrases, frequency of detected entities and opinion by concept are included. Results segmented by product category (restaurants, hotels, museums, monuments, etc.), user origin, type of user (single, couple, family, etc.) and tourist destination.

Visitor clustering model: results of clustering profiles of visitors to Catalonia were detected from bank transaction data. The procedure is carried out through clustering techniques on the behaviour of calculated trips.

- **Spain: ICTUCAT. INTUCAT**

The current Catalonia Strategic Tourism Plan proposes, among other structural actions, to develop a tourism competitiveness indicator , aimed at evaluating the dynamics of tourism activity in the country, and a tourism intelligence indicator , aimed at evaluating the dynamics of tourism sustainability.

[https://empresa.gencat.cat/ca/treb\\_ambits\\_actuacio/turisme/coneixement\\_planificacio/estadistiques-turistiques/indicadors-turistics-ictucat-intucat/index.html](https://empresa.gencat.cat/ca/treb_ambits_actuacio/turisme/coneixement_planificacio/estadistiques-turistiques/indicadors-turistics-ictucat-intucat/index.html)

System of tourist competitiveness indicators - ICTUCAT

The ICTUCAT indicator system is structured on the basis of 7 areas of measurement, which refer to communication, commercialization and economy, visitor characterization, governance, management of attractions, product and companies of tourism.

Tourist intelligence indicator system - INTUCAT

The INTUCAT indicator system is structured based on 4 areas of measurement, which refer to environmental sustainability, social sustainability and economic sustainability of the tourism activity in the destination. A fourth area that has been considered essential is the measurement of the achievement of the Sustainable Development Goals (ODS).

- **Spain: SEGITTUR**

SEGITTUR, under the Ministry of Industry, Trade and Tourism, and attached to the State Secretariat for Tourism, is responsible for promoting innovation (R&D) in the Spanish tourism sector, both in the public sector (new promotion models and channels, management and creation of smart destinations, etc.) and in the private sector (support for entrepreneurs, new sustainable and more competitive management models, exporting Spanish technology). SEGITTUR is a powerful and effective operator capable of contributing to the development, modernisation and maintenance of a leading tourist industry through technological innovation. It generates and manages the technology, expertise, and innovation necessary to improve competitiveness, quality and sustainability in the environmental, economic and social aspects of tourism. It disseminates, promotes and implements in tourism markets both at home and abroad the best practices, know-how and technological innovation that have made Spain a world reference in the sphere of international tourism.

SEGITTUR is currently developing the following strategies::

Smart Destinations Platform

The Spanish government, through SEGITTUR, provides a Smart Destinations Platform, a project through which Spain aims to place itself at the forefront of tourism countries by using digitalization to improve the tourism experience and offer integrated services of value at the destination. The aim of the platform will be to integrate, collate and combine public and private data to build more competitive intelligence on the ecosystems of Spanish destinations, while also activating continuous innovation, interconnecting and meeting the needs of all agents present along the tourism value chain: tourists, destinations and companies.

SIT Tourism Intelligence System

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The SIT Tourism Intelligence System is technologically based on a big data platform in cloud mode, which studies, incorporates and analyses different sources of information and makes them available to the tourism sector.

The system collects, organises and analyses different sources of information, creating dashboards and dynamic reports adapted to the user's needs, and making it possible for the information to be downloaded. The SIT facilitates access to and dissemination of knowledge, helping to improve the strategic planning processes of the entire sector, including specific tourist destinations. Improving tourism measurement and monitoring capabilities facilitates better-informed strategic decision-making by tourism stakeholders and operators.

The dissemination of the information collected in the SIT is carried out in two ways:

The system's public information is available through DATAESTUR [dataestur.es](https://dataestur.es), where all sources related to tourism are collected and can be consulted openly by all types of users.

Destination-specific information is accessible through tailor-made developments. The data sources they contain may have some kind of restriction that limits their use and open access.

### 3.4 Results from academic literature

#### 3.4.1 Stakeholder's involvement in smart destinations

In a case study from Ljubljana (Slovenia), Johnson et al. (2023) investigated suppliers' perceptions on engaging in smart destinations. The authors conducted 24 semi-structured interviews in the year 2019, participants were recruited in a snowball system starting from the 45 smart city initiatives in Ljubljana. Their core question for our context was "Why did you become involved in smart tourism?". The authors identified a number of statements, most of them, however, only loosely related to data-driven destinations (but rather to electrical vehicles or participation in wheelchair-fit accommodation schemes). The authors report six practical implications derived from their study:

1. "there is still a need for further smart initiative implementation",
2. "engagement in smart destinations are not based on macro-environmental factors but organisational and relational influences that affect local tourism businesses",
3. [destination may] "consider including municipal representatives to further their supplier involvement",
4. "clearly establish the role of the DMO in the smart destination development",
5. "suppliers tend to collaborate with those who they have frequent interactions with",
6. "international chains should recognise that local tourism entrepreneurs and executives will need flexibility to act if they are to make adjustments to accommodate the local market".

Unfortunately, there are no answer to the question, why suppliers become involved in smart tourism.

Hidayah et al. (2022) investigated the stakeholders' synergies in realising a smart tourism destination in Wonosobo, Indonesia. They found the four concepts of synergy: partnerships, government support, human capacity and personal competitiveness. The main challenges in implementing smart tourism lie in human resources, community involvement, compliance with business actors, compactness of stakeholders, government policies, and financial budget. The study confirms that investing in human resources, government involvement, and infrastructure support are key for smart tourism development. It suggests that local governments should focus on developing public systems, digital promotion, stakeholder collaboration, funding, and human resource development. The study

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emphasizes the critical role of government support in regulating and policymaking to maintain an organized environment for smart tourism, which involves multiple stakeholders and conflict mediation.

Gelter et al. (2022) carried out a qualitative text analysis of interviews with stakeholders from two different Swedish destinations to identify recurring themes in the stakeholders' understanding of smart tourism destinations. Study findings suggest that destination stakeholders believe there should be a balance between technological advancement and softer, more meaningful values for sustainable destination development. The research highlights the importance of considering sustainability, ethics, interdisciplinary collaboration, and transparency in creating smart tourism destinations. Stakeholders emphasize the significance of understanding new technologies, fostering openness, simplicity, responsiveness, and development. Understanding these aspects can enhance decision-making processes and communication among stakeholders, as noted by interviewees in the study.

Zvaigzne et al. (2023) aim in their study to analyse the literature on smart tourism and the involvement of stakeholders in its implementation. Smart tourism is seen as an evolution driven by technology, economics, and social factors like the Internet, social media, and mobile apps. Stakeholder theory highlights how individuals and groups within an organization work together towards common goals. The research suggests that collaboration between internal and external stakeholders is crucial for tasks such as designing tourism strategies, coordinating promotions, and standardizing practices.

In their study on Switzerland and Liechtenstein, Garbani-Nerini et al. (2022) identified four clusters of the smartness concept from 35 respondents in the two countries mentioned ("technology", "management practices", "sustainability", and "user"). They also identified the data sources used by the respondents, grouped by internal and external sources (Figure 3). Further results covered the usage of collected data (Table 5).

Table 5 Usages of collected data (more than one answer allowed)

Type of data usage	%
Measure the performance of marketing activities	80.0
Making decisions and defining strategies for the company	71.4
Personalized messages and/or campaigns	60.6
Monitoring activities	60.0
Creation of new projects/services	54.3
Forecast	48.6
Institutional/corporate communication	45.7
Personalized products and/or services	43.8
Measure the performance of the employees in your organization	2.9

Source: Garbani-Nerini et al. 2022, p. 207

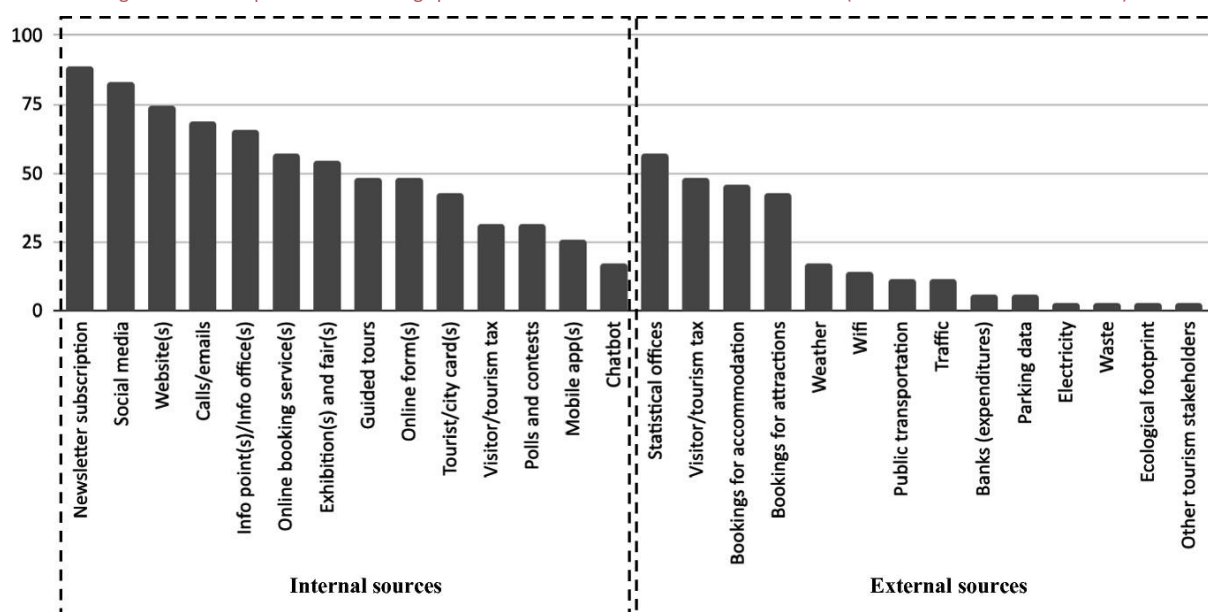
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Figure 3: % of respondents collecting specific data from internal and external sources (more than one answer allowed)



Source: Garbani-Nerini et al. 2022, p. 205

Femenia-Serra and Ivars-Baidal (2021) developed a more critical perspective on the concept of smart destinations using the example of Benidorm in Spain. They found that DMOs gain knowledge and a clear picture about tourists and helps with marketing and repositioning the destination.

In their 2021 study, Huiyue Ye, Sunny Sun & Rob Law sought insights from stakeholders in smart tourism to create a framework for advancing smart tourism in Hong Kong. Through qualitative methods, they identified essential components, potential advantages, and existing obstacles in implementing smart tourism, using Hong Kong as a case study. The study suggests that the Hong Kong government could leverage smart tourism to diversify the city's image, enhance destination competitiveness, and rejuvenate the tourism sector. It emphasizes the need for government leadership in providing incentives to foster collaboration among stakeholders for smart tourism development, with a paramount focus on ensuring the city's safety.

Sun et al. (2022) used interviews to analyse the obstacles to the development of smart tourism in Hong Kong. The results show that there are obstacles from four main perspectives: economic, socio-cultural, technological, planning and administrative. The literature review on smart tourism destinations highlights differing conceptualizations by scholars, with no unified model proposed for how these components interact. Ambiguity exists in descriptions of components, necessitating further research for accurate definition and understanding. Measurement methods lack consistency, often due to variable focus and unit of analysis. Component-based methods may offer better insight into causal relationships. Empirical research on smart tourism development is scarce, indicating a need for more comprehensive frameworks and shared definitions.

Pesce et al. (2019) conducted multiple case studies to investigate how the process of aligning different stakeholders' interests to create value from data can be realized. The findings indicate that a platform outperforms its competitors by leveraging multiple drivers of value creation to align the interests of previously divergent stakeholders. This ability to realign interests is not dependent on the platform orchestrator's industry-specific knowledge. They observe that Google has taken on a system integration role in the cultural ecosystem, leading to new considerations for museums in creating value for the tourism industry.

The study by Chen et al. (2023) analyses the metaverse in tourism marketing with the help of interviews with 19 representative stakeholders in metaverse tourism. The study identified key drivers

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of metaverse tourism development as planning and management, economic, sociocultural, and technological factors, along with recognition and acceptance. Conversely, hindrances primarily originate from government policies, industry practices, tourist behaviors, local community dynamics, and educational institutions.

Ivars-Baidal et al. (2023) conducted a comparative case study of seven cities in Europe to examine “the degree of interrelation between stakeholder networks involved in tourism governance and smart city development”. The analysis of stakeholder networks shows that tourism governance and smart initiatives are not connected in different cities. This limits progress towards the expected synergies of true smart tourism city governance. In theory, the study contributes to the debate on new forms of governance for the complex development of urban tourism. In practice, the relationship between tourism governance and smart city initiatives needs to be redefined in order to improve the efficiency of urban tourism policy. They propose a transition model towards smart tourism city governance.

### 3.4.2 Sustainable tourism indicators

In another study, Ivars-Baidal et al. (2023) use a mixed-methods approach to take a critical look at existing systems with sustainable tourism indicators for smart destinations. The results show that very little progress has been made on sustainability measures. Urban and tourism indicators are clearly separated, although a smart city could contribute to enhancing or understanding and improving the management of tourist cities. There are also clear deficits when it comes to integration into smart city platforms.

Ivars-Baidal et al. (2019) present a comprehensive model for (STDs) that enhances the understanding of the role of Information and Communication Technologies (ICTs) in tourism destination management. Accordingly, the Delphi technique has been utilized to ascertain expert opinions on the feasibility of the STD approach, its benefits, and limitations, as well as the extent of ICTs' impact on the management and marketing of tourism destinations. The advancement of Information and Communication Technologies (ICTs) is playing a significant role in molding a fresh landscape for managing tourism destinations, necessitating varied management strategies, with the most prominent being the STD approach. There are indisputable benefits to be reaped from factors such as the integration of ICTs. However, the primary obstacles impeding progress towards the STD approach lie at the strategic-relational level. The hurdle for STD lies more in governance rather than technology.

Font et al. (2023) evaluated the impact of sustainable tourism indicators on destination competitiveness with reference to the European Tourism Indicator System (ETIS) by evaluating the absorptive capacity of destination management organisations to implement and use sustainable tourism indicators to make policy decisions. The study shows how DMOs gain knowledge about the importance of sustainable tourism indicators through ETIS and how some of them adopt this knowledge by adapting ETIS and developing their internal systems. The results suggest that DMOs or their policies do not change through the use of sustainable tourism indicators or other data sources, or that indicators are used to improve the sustainability and competitiveness of tourism.

Using participatory online workshops, Crabolu et al. (2023) have investigated whether sustainability indicator systems contribute to better sustainable destination management. Instead of the straightforward assumption that an increase in evidence leads directly to changes in policy and sustainability, a more complex understanding is pursued here. It emphasises the importance of systems thinking to recognise the multi-layered interactions and linkages between different factors arising from the application of sustainability indicators in tourism. By examining the conceptual, instrumental and structural significance of these indicator systems in greater depth, it is recognised that they can contribute significantly to increasing sustainability in tourism destinations in various dynamic ways.

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## 4 Empirical results (survey and workshops)

In order to produce empirical results on data and information needs for the future Competence Centre to support data management in tourism destinations, the project team initiated two workshops and an online survey. The questions asked were informed and inspired by the previous phases (results from academic literature and, more important, previous projects). This section introduces the methodology and main results of both workshops and online survey.

### 4.1 Workshops

Two workshops were organised to complement the D3HUB stakeholder survey, and allow for a more in-depth discussion format around key topics. As with the survey, the aim here was also to generate insights on the perspective of a future European Competence Centre. The target groups were identical to those in the survey. The first workshop was held on May 21st within the scope of the NECSTouR meeting in Luleå, Sweden and was attended by 55 people. Participants were confronted with six left/right questions that allowed for binary choice. These had the function to set the scene and foster subsequent discussions. They are not votes in the traditional sense. The six questions posed were:

1. Do you think that European tourism destinations should become smarter and more data-driven (Yes, No)?
2. Do you have a destination dashboard available (Yes, No)?
3. Did you already use the EU Tourism Dashboard (Yes, No)?
4. What should a European Competence Centre for data-driven tourism destinations provide (Data, Expertise)?
5. How would you like to learn about data-driven destination management (In person, Online)?
6. Do you find a European Competence Centre for data-driven destinations a good idea (Yes absolutely, I am sceptical)?

The second workshop was held online on June 21, to which 28 active participants took part. This workshop started with a plenary introduction and meeting agenda, presenting the D3HUB project and subsequently asking 9 questions through use of a Mentimeter. These questions were similar to, and slightly expanded upon the six questions posed during the Luleå-meeting. Additional questions asked during this online meeting were: (i) Is your destination smart and data-driven (Yes, No)?, (ii) Which kind of support would you prefer (Money, Expertise)?, (iii) Who should finance such a Competence Centre (Me, Others)? After initially answering all 9 questions, participants were then divided over break-out rooms to discuss in more depth the type of services a European Competence Centre should provide, the type of support needed, the didactic approach to knowledge-sharing, and the financial aspects of organising a Competence Centre.

Overall, it can be stated that the majority of participants surveyed in the workshops are of the opinion that their destinations are not smart and data-driven. Most people therefore take the view that European tourism destinations should become smarter and more data-driven. The majority of those surveyed has a destination dashboard available. The slight majority are also familiar with the EU Tourism Dashboard, however most of the respondents have not yet used it.

When asked whether a European Competence Centre for data driven tourism destinations should rather provide expertise or data, the majority of respondents voted in favour of expertise, less often for data. Data and expertise are both needed, but mainly expertise as many organisations already have a lot of data, but need to learn how to deal with it. Expertise is required on the topics on data management and sharing on local level and how to do analysis and how to sustain strategies. Expertise was also welcomed in terms of providing an overview and understanding of available - as well as missing - datasets and overarching EU initiatives. While expertise was thus generally preferred over

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data, some participants also mentioned the opportunity of EU initiatives to provide access to large and diverse datasets, and propose the value of networks when negotiating with corporate data providers. Additionally, expertise is generally preferred over monetary support as it is important to learn from each other and it brings more value to help destinations. Further specifying the type of support that is needed, in the online breakout rooms, participants mentioned the entire process of collecting, analysing, using data, and deriving meaningful insights from data. Furthermore, there was an interest in learning about best practices across the national level, among others on working with data providers and tools for data handling and standardisation of indicators.

People who took part in the on-site workshop are more often undecided as to whether they would prefer to learn about data-driven destination management online or in-person, with in-person sessions mentioned as being important to build a community. In contrast, the clear majority of participants in the online workshop opted for the online version. In general, a hybrid approach is preferred including regular online sessions and occasional in-person meetings as sometimes in-person meetings are beneficial and crucial for exchanging and sharing ideas, while online sessions allow participants to access information according to their schedules. Whether online or in-person, in both cases the need for strategies to overcome language barriers was mentioned.

A Competence Centre to support smart destination management is mostly welcomed as it creates a network for exchanging experiences and good examples, it provides a clear overview of various European tourism data initiatives and it enables development of good tourism strategies based on data. At the same time questions are posed on the international comparability of data. The difference in data proficiency of different DMOs and potential participants was also mentioned as a challenge that would need to be overcome. Furthermore, it was considered crucial that the Competence Centre complements regional and national initiatives and existing networks. The majority vote in favour of the Competence Centre being financed by others. The EU will fund the Competence Centre for three years, after which it must be self-funded. Suggestions include that everyone benefiting from the Competence Center should contribute financially - potentially via a subscription fee - or that sustainability should be ensured through diverse funding sources. While funding is in the first place sought via participating DMOs, there might also be room to involve private companies interested in tourism innovation. Some participants furthermore mentioned the possibility of non-monetary, in-kind payments such as contributing with peer-learning experiences.

## 4.2 Survey

The D3HUB project team invited Destination Management Organisations (DMOs) and other stakeholders from the tourism destination ecosystem to participate in a Europe-wide survey that was available in five languages on EUSurvey. The primary target group were DMOs, the secondary target groups were tourism associations, research institutions, solution provider and others.

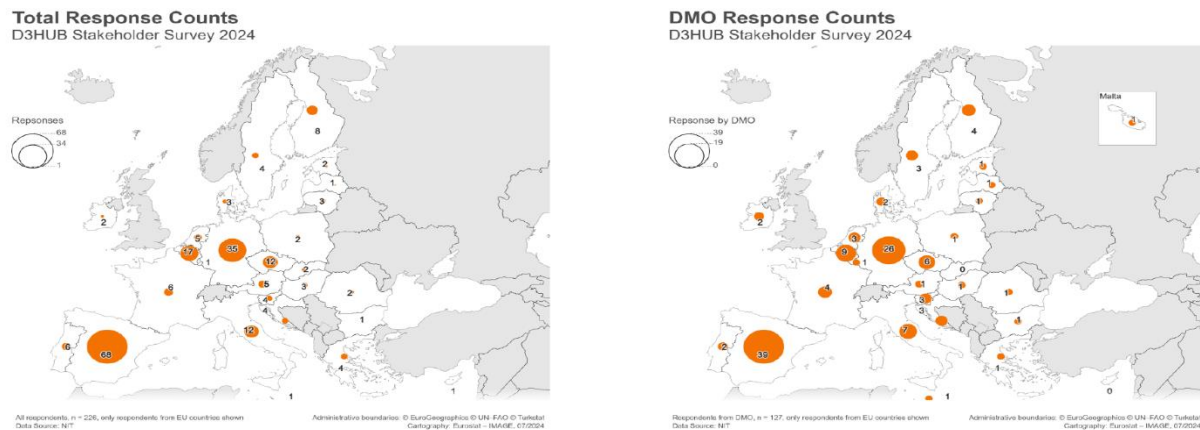
The objective was to find out more about the status quo of data use, the data and information needs of European tourism stakeholders and their expectations towards a European Competence Centre for data-driven destination management (D3HUB). 226 persons took part in the 7–10-minute survey, covering all 27 EU countries and all levels of DMOs (Figure 4). We identified a subgroup of 127 respondents from DMO of all levels (local, regional, (supra-) national). Data was collected in the period from April to June 2024. The results of the survey are presented in the main section of this publication.

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Figure 4 Total response counts

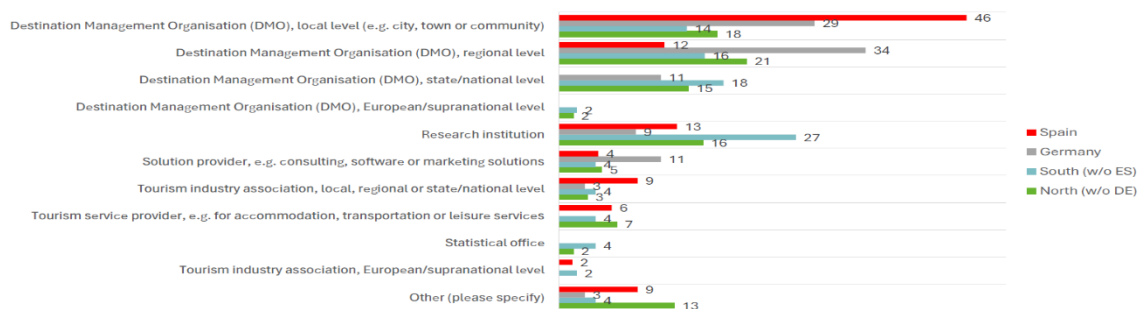


#### 4.2.1 Organisational Background

Participants in the survey came from various organisational backgrounds. More than half represented Destination Management Organisations (DMOs) on local, regional, national and European levels (Figure 5). Participants came largely from DMOs at local and regional level. 16% of respondents represented a research institution, a further 7% a solution provider. Other respondents came from tourism industry associations, tourism service providers, statistical offices or public authorities.

A closer look at the geographical distribution shows that the majority of respondents by far came from Spain and Germany. A particularly high proportion of respondents from Spain could be found among DMOs at local level and tourism industry associations at local, regional and national level. German respondents mainly represented DMOs at regional level and solution providers. It is also striking that research institutions that took part in the survey are more frequently located in the south (excluding Germany) than in the north (excluding Germany).

Figure 5 Type of organisation by area



Source: D3HUB Stakeholder Survey 2024; Question A1: "Which type of organisation do you represent?", n=226, all respondents, data in per cent.

The DMOs were asked to indicate the tourist overnight stays in their destination in 2023. The average number of overnight stays increased with the type of organisation. The median for local DMOs was 900,000 overnight stays, for DMOs at the regional level it was 7.1 million; and for DMOs at the national level it was 42 million.

Local and regional DMOs most frequently described the landscape of their destination as an urban-rural mix (38%). Almost a quarter stated 'rural nature', while 18% selected 'city'. 16% said that their destination was on the coast, while mountains were the least common (5%). A comparison of northern

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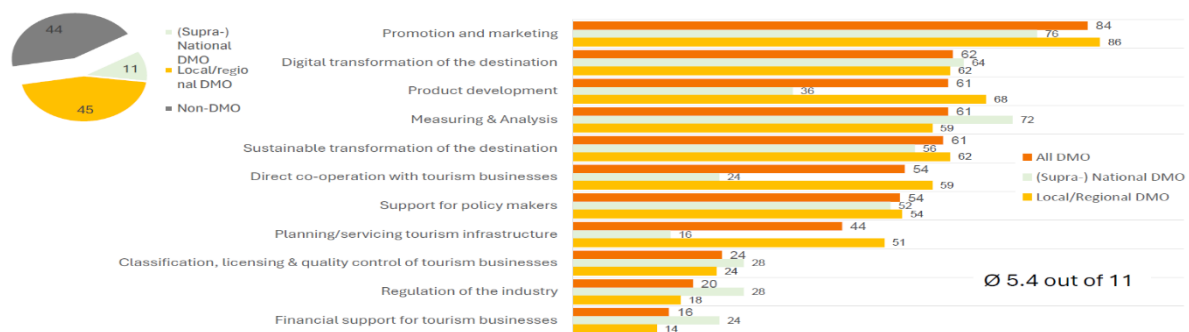
and southern Europe shows that organisations from the south stated ‘rural nature’ or ‘mountain’ more often than organisations from the north, whereas the latter were comparatively more likely to come from cities.

The DMOs that participated in the survey have a wide range of activities (5.4 out of 11, Figure 6). They are most frequently involved in the area of ‘promotion and marketing’ (84%). 62% are also involved in the ‘digital transformation of the destination’. Because most respondents came from the project partners network, we can assume that participants' interest in smart, data-driven tourism destination management was above average.

Over 60 per cent are also involved in the fields of ‘product development’, ‘measuring & analysis’ and ‘sustainable transformation of the destination’. More than half of the DMOs surveyed co-operate directly with tourism businesses or support policy makers. 44% are planning or servicing tourism infrastructure. In addition, one in four DMOs takes care of classification, licensing and quality control of tourism businesses.

DMOs at local or regional level are comparatively more often involved in product development, direct co-operation with tourism businesses and planning and servicing tourism infrastructure, while DMOs at national level are more often involved in measuring and analysis, regulation of the tourism industry and financial support for tourism businesses.

Figure 6 DMO: Fields of activity



Source: D3HUB Stakeholder Survey 2024; Question A5: “In which of these fields is your DMO actively engaged?”, n=102 Local/Regional DMO, n = 25 (Supra-) National DMO, multiple answers, data in per cent.

#### 4.2.2 Data Literacy: Organisational Expertise

More than half of the DMOs state that they can easily obtain information on the number of overnight guests per month and on the accommodation business register. One third can easily access registers of tourism businesses and a quarter obtain information on yearly data on residents' perception of tourism. One in five find it easy to receive information on number of enterprises and resources with service quality or sustainable certifications, monthly employment figures in tourism and monthly number of daytrips. 13% state that they cannot easily obtain any of the selectable information.

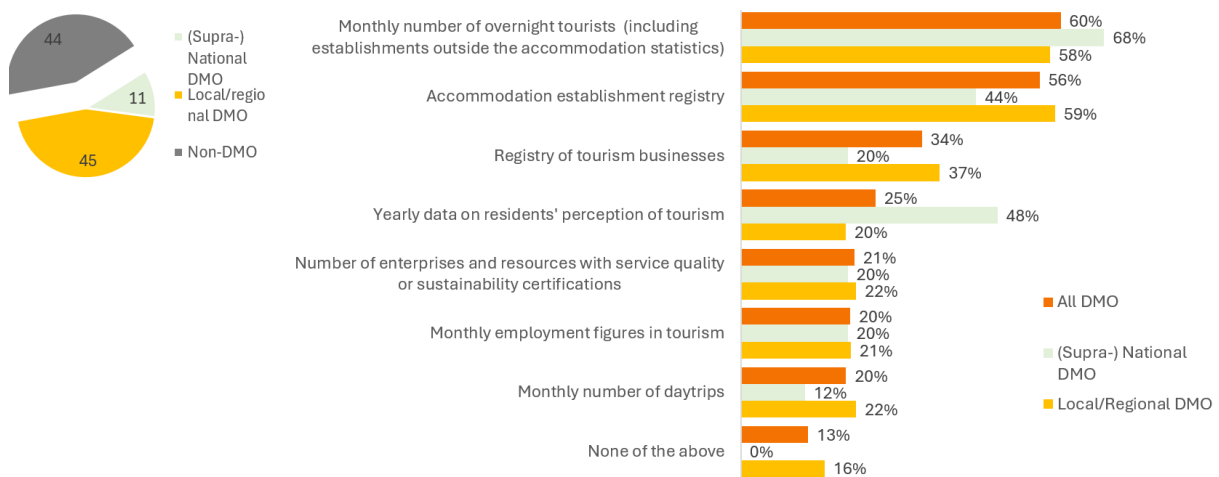
The comparison between local and regional DMOs and national DMOs shows that it is generally somewhat easier for organisations at national level to obtain the information requested. It is easier for them to obtain information on monthly figures on overnight guests and annual data on residents' perception of tourism. DMOs at local and regional level find it comparatively easier to obtain information on accommodation establishment registry, registry of tourism businesses and monthly number of daytrips.

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Figure 7 Easy obtainable information about the destination

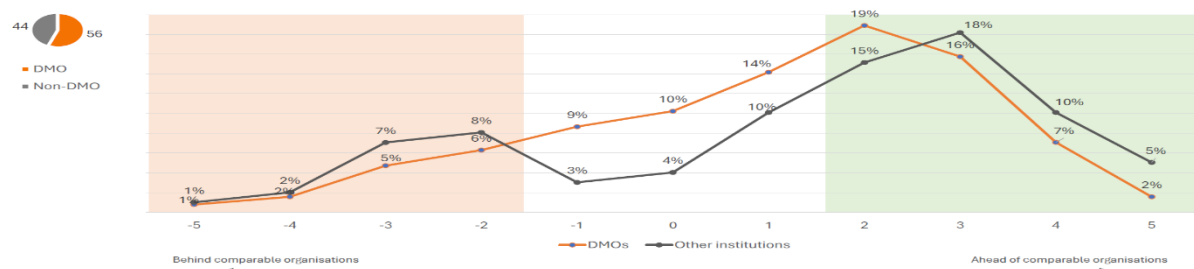


Source: D3HUB Stakeholder Survey 2024; Question B1: "Which of the following information can you easily obtain for your destination?", n = 102 Local/Regional DMO, n = 25 (Supra-) National DMO, multiple answers, data in per cent.

The participating DMOs were confident on their data literacy: 43% saw themselves ahead of comparable organisations, only 13% thought that they lagged comparable organisations (Figure 8). Overall, DMOs at regional and national level state more often than local DMOs that they see themselves ahead of other organisations. At the same time, regional DMOs also have the highest proportion of respondents who say that they are behind comparable organisations. Few DMOs rated themselves in the middle of the field here. National DMOs are the least likely to think that they are behind other organisations regarding their skills and expertise in the context of data-driven, smart destinations.

Compared to other organisations, DMOs tend to rate their skills and expertise as average. Non-DMOs rate themselves slightly more often as ahead of comparable organisations.

Figure 8 Assessment of the organisation's skills and expertise in the context of data-driven, smart destinations



Source: D3HUB Stakeholder Survey 2024; Question B2: "How do you rate your organisation's skills and expertise in the context of data-driven, smart destinations?", n=226, data in per cent.

Only half of DMOs (47%) reported that they have a smart destination strategy or at least that smart destination elements are in the general destination strategy. Another 47% do not have a specific smart destination strategy.

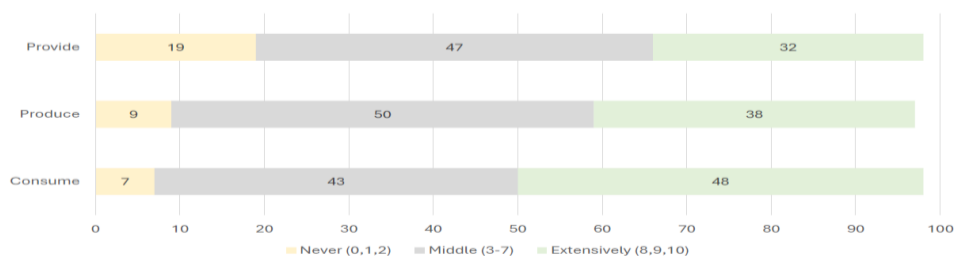
Half of all DMOs are extensive consumers of destination-related data (48%, Figure 9). 7% state that they never consume respective data. 38% report that they also produce destination-related data, and around a third also provides the data. 19% never provide it. Compared to other organisations, DMOs produce and provide data slightly more frequently.

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Figure 9 Consuming, producing and providing tourism destination related data



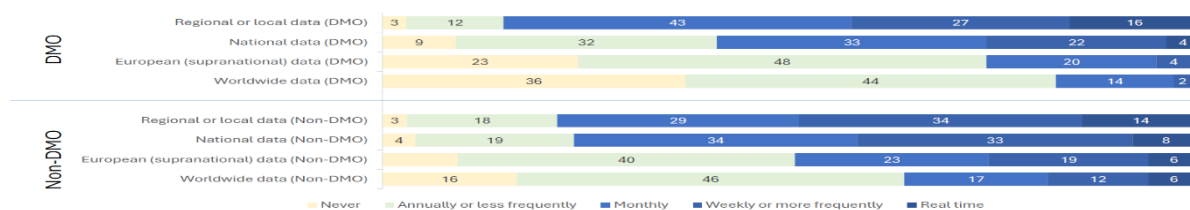
Source: D3HUB Stakeholder Survey 2024; Question B4: “To what extent does your organisation consume, produce and provide tourism destination related data?”, n=127 DMO, data in per cent.

Even though half of surveyed organisations make extensive use of destination related data, less than one in three (29%) was able to provide KPIs for the organisation. Organisations that named important KPIs listed an average of 4.3 indicators. More than half of these mentioned overnight stays as an important KPI. Also relevant are tourist expenditure/tourism revenue, arrivals and resident’s satisfaction and acceptance.

#### 4.2.3 Status Quo of Data Use

In general, all organisations surveyed use regional and local data most frequently, followed by national data, next European data and least frequently worldwide data (Figure 10). Organisations that are not DMOs generally use all types of data more often weekly or more frequently or in real time than DMOs.

Figure 10 Use of data on spatial levels



Source: D3HUB Stakeholder Survey 2024; Question C1: “How often does your organisation use data of the following spatial levels?”, n = 127 DMO, n = 99 Non-DMO, data in per cent.

Data from official accommodation statistics and from online marketing activities are used most frequently (Figure 11, for abbreviations please see the questionnaire in the annex, question C2). These types of data are also rated as the most helpful by respondents. Data on reservations and bookings in accommodation establishments and other official statistical data are also frequently used on a weekly or monthly basis. In real time, data from online marketing activities and visitor flows are often used. Data on the social impact and on the ecological impact of tourism are often only used annually or never, but are also rated as helpful. Data from offline marketing activities is the least helpful.

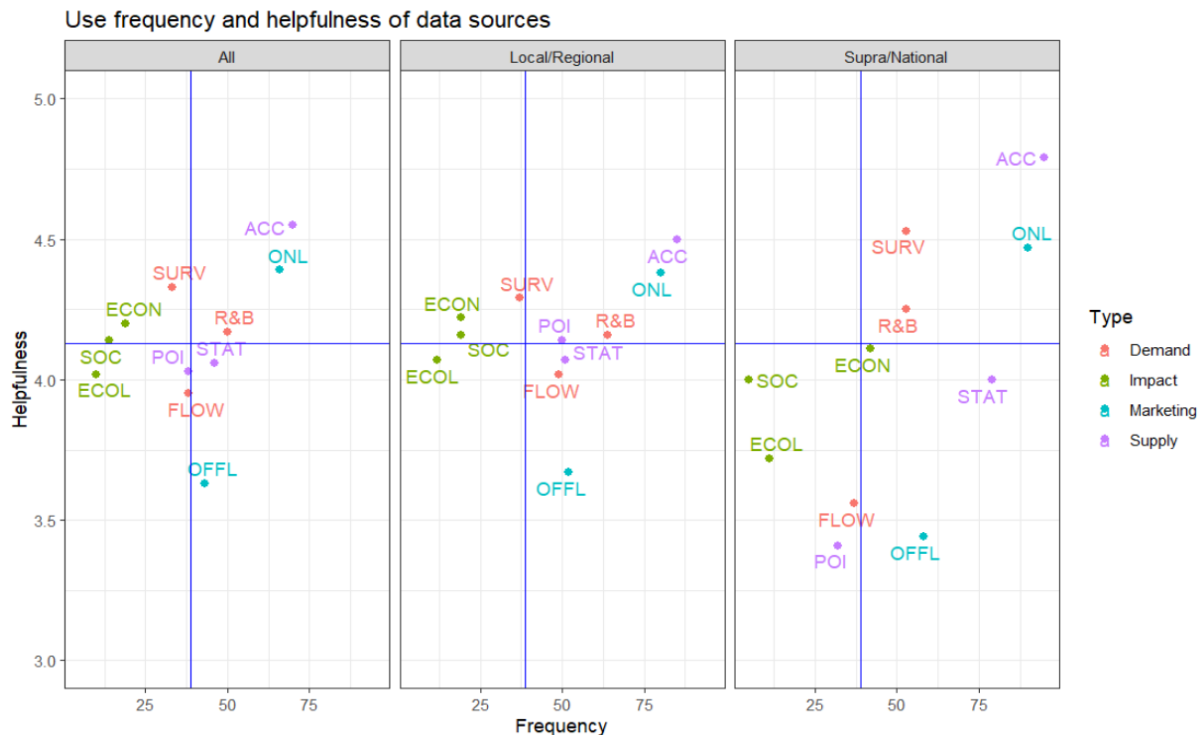
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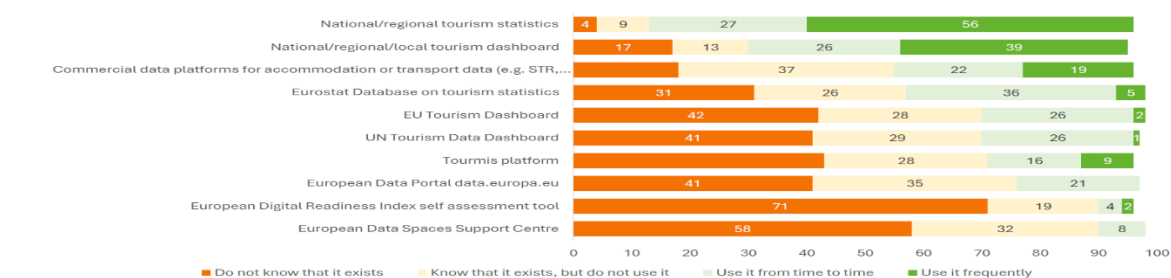
Figure 11 Use frequency and helpfulness of data sources



Source: D3HUB Stakeholder Survey 2024; Question C2: “How often do you use these types of data?” and question C3: “How helpful are these data for your organisation?”, n=127 DMOs, data in per cent.

The data and knowledge sources that respondents know and use most frequently are national and regional tourism statistics and local, regional or national tourism dashboards (Figure 12). More than 40% also use commercial data platforms for accommodation or transport data or the Eurostat database on tourism statistics often or from time to time. All other tools surveyed are either less well known or are not used even though they are known. The European Data Portal data.europe.eu and the European Data Spaces Support Centre are often known but not used. Over 70% of respondents were not familiar with the European Digital Readiness Index self assessment tool and 58% did not know that the European Data Spaces Support Centre existed. Altogether, even in this group of stakeholders with an above-average interest in the topic, actual competence is moderate or lower.

Figure 12 Knowledge and use of data



Source: D3HUB Stakeholder Survey 2024; Question C4: “Do you know and use these data and knowledge sources?”, n=127 DMOs, data in per cent.

#### 4.2.4 Expectations

A five-stage model was used to ask for the support needs of DMOs (Figure 13). Respondents were asked to indicate whether they need “no support” or “very much support” on a five-point scale on the

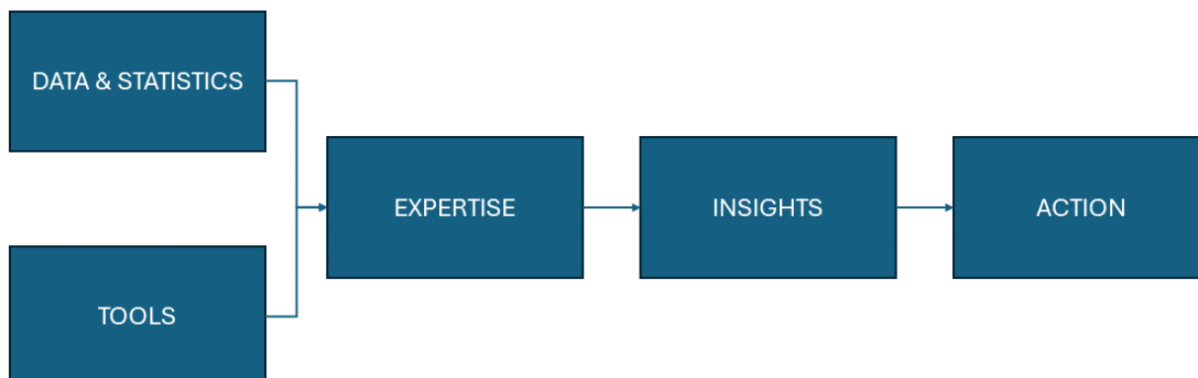
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topics of “Data & Statistics” (access to raw data or aggregated statistics), “Tools” (access to the software tools and platforms needed to analyse or visualize data and statistics), “Expertise” (availability of human resources to professionally handle tools and data/statistics, including legal aspects), “Insights” (ability of the organisation to generate knowledge and insights from data and statistics so that the right steps can follow), and “Action” (ability of the organisation to actually put the insights into action and implement adequate measures).

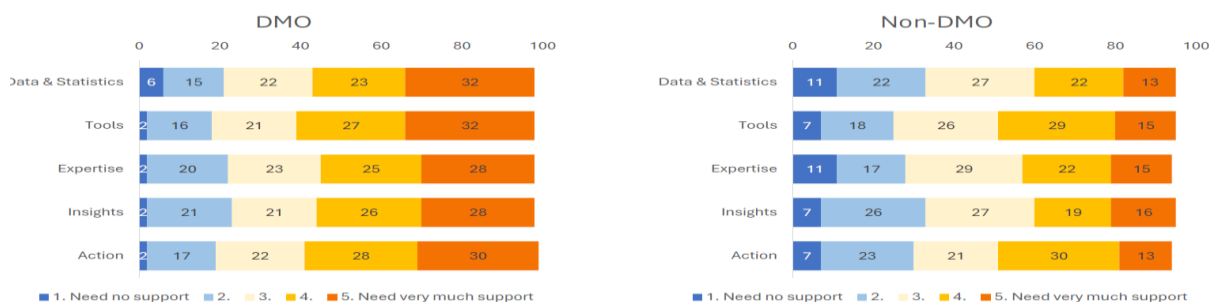
Figure 13 Five-stage-model of support needs



Source: D3HUB Stakeholder Survey 2024

Consequently, more than 4 in 10 (41%) of participating DMOs say that they would need “much support” (items 4 or 5) in all five stages of the model. 19% even say that they need „very much support“ in all five stages (item 5). Organisations that are not DMOs have a slightly different assessment. They are more likely than DMOs to state that they do not need support in all five stages. Both DMOs and non-DMOs require the most support in the ‘action’ and ‘tools’ stages (Figure 14).

Figure 14 Support required for the individual steps of the process



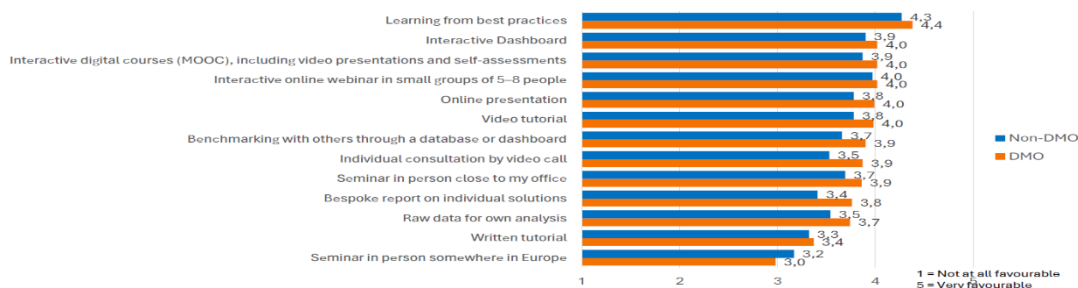
Source: D3HUB Stakeholder Survey 2024; Question D1: “How much support does your organisation need in each of the steps in the process?”, n = 127 DMO, n = 99 Non-DMO, data in per cent.

When asked, which formats participants would welcome most, learning from best practices, interactive dashboards, interactive digital courses and interactive webinars in small groups received the most interest (Figure 15). In general, online formats were rated as more favourable than offline formats. DMOs consistently rate all formats except seminars in person somewhere in Europe slightly higher than Non-DMOs. There are barely any differences between national and local/regional DMOs.





Figure 15 : Rating of different support formats

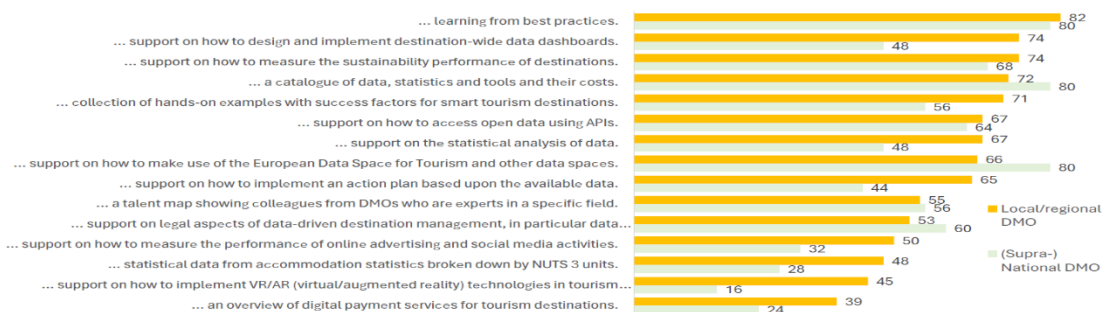


Source: D3HUB Stakeholder Survey 2024; Question D2: "Support can be offered in different formats. How do you rate the formats in the list below?", n = 127 DMO, n = 99 Non-DMO, data in per cent.

At the same time, DMOs had a clear view on their preferences which services a competence centre should offer. Ranked first is, again, "learning from best practices" (82%), followed by a catalogue of data, statistics and tools and their costs (74%). Ranked third is the wish to get support in using data for a sustainable transformation of destinations (73%).

National DMOs desire a catalogue of data, statistics and tools as well as support on how to make use of the European Data Space for Tourism and other data spaces more often than local or regional DMOs (Figure 16). On the other hand, local and regional DMOs indicate more frequently that the competence centre should offer support on how to design and implement destination-wide data dashboards and on how to implement VR or AR technologies in tourism destinations.

Figure 16 The Competence Centre should offer...



Source: D3HUB Stakeholder Survey 2024; Question D3: "Please select all ideas and offers that the Competence Centre should offer.", Local/regional DMO n = 102, national DMOs n = 25, data in per cent.

We received 42 additional suggestions and comments from 31 respondents that covered the three main categories contents (What topics to cover in a CC?), formats (How to organise knowledge transfer in the CC?) and functions (Which role the CC could play in Europe?). The comments touch upon very different aspects within these categories. Some examples are "Support for upskilling", "To define beginners – middle – advanced destination cohorts" or "Standardisation in touristic data within the European context".



## 5 Expert qualifications and skills

Since the future Tourism Competence Centre must provide services to the entire European tourism sector, and given the cross-sectorial nature of tourism as well as the diversity and specific characteristics of European tourist destinations, the involvement of external experts will be essential. Moreover, the tourism sector is closely linked with other sectors such as transportation and energy, to name a few, which further emphasizes the need for expertise across these interface sectors. This external experts (including scientists, practitioners, and consultants) will be essential to the Competence Centre's success, as they will contribute content and insights to support peer-to-peer learning and build a collaborative knowledge base. For this reason, during the pilot phase scheduled for 2025, the inclusion of such experts is already planned. In the following sections the role of these experts along with their qualifications and skills requirements and expected contributions are described.

### 5.1 Role of experts

The external experts will be primarily needed in the pilot phase. The pilot phase goes from Feb 2025 to Jan 2026. Within the pilot phase, external experts will have two functions:

1. Provide content for the webinar series,
2. Technical assistance in working 1:1 or in group with pilot DMOs to implement data collection and visualisation processes.

Experts receive guidelines to ensure that the content is implemented as homogeneously as possible across the thematic clusters.

#### 5.1.1 Webinar series

We plan to have four clusters in the pilot phase (Managing the balance between residents and visitors, Climate change mitigation and adaptation, Redistributing tourist flows in space and time, Supporting emerging destinations to attract quality and sustainable tourism). Each cluster will provide approximately five webinar topics. The topics might be covered in individual sessions or combined (two or more topics in one longer session). We assume that from the total of approximately 20 webinar topics, 50% can be covered by the project team and 50% need to be covered by external experts.

These assumptions (five topics per cluster, 50% by external experts) are subject to actual needs and maturity of pilot destinations. These will be assessed through interviews during the first two months of the pilot phase. After that phase we might need to adapt the webinar planning.

#### 5.1.2 Technical assistance

Pilot DMOs will be working on data collection and visualisation for their own DMO. Depending on maturity of pilot DMOs there will be need for 1:1 or in group assistance in the implementation. External experts will support this 1:1 or in group assistance.

### 5.2 Skills requirements

There are two types of relevant qualifications and skills:

1. Domain knowledge (i.e. expertise in one or more of the topics to be covered in the pilot phase)
2. Methodological knowledge (i.e. expertise in how to convey information in digital formats).

Skills requirements need to be suitable for an objective and discrimination-free selection process.

#### 5.2.1 Domain knowledge

Experts will be selected for specific topics in the webinar series and for specific 1:1 or in group pilot assistance. The topics which need external expertise will be defined after the initial consultation phase with the selected pilot DMOs. The topics will fall within the thematic scope of the four clusters

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(Managing the balance between residents and visitors, Climate change mitigation and adaptation, Redistributing tourist flows in space and time, Supporting emerging destinations to attract quality and sustainable tourism).

Experts will be selected for technical assistance for the tasks where internal talent need support (i.e. transport CO2 emissions factors, climate change adaptation for tourism, ...) .

### 5.2.2 Methodological knowledge

For the webinar series, experts will need skills and experience in conveying complex topics through digital online-conferences in the four thematic clusters mentioned above.

For the technical assistance, experts will need in-depth knowledge and experience in data management. Experience in consulting with DMOs of various levels is helpful.

### 5.2.3 Proof of skills

Applying experts can show their qualification and skills by

1. a short CV showing their education and experience in relevant fields,
2. project references from previous work,
3. publications.

Selection of experts will take the skills needs into account. Assessment of candidates will be done by at least three members of the project team using a scoring system with 0 to 10 points for methodological and domain skills. Oral interviews can be implemented in case of doubts.

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## 6 Conclusions

We can summarise the data and information needs of DMOs in five points:

- 1. Demand for Expertise and Data Management Support:** DMOs expressed a critical need for expertise over additional data. Many organisations already collect substantial data but require guidance in managing, sharing, and analyzing it. This expertise includes effective data management strategies, best practices in data sharing, and sustainable strategy development.
- 2. Dashboard Support and Tools Catalogue:** A common requirement is for resources on destination-wide dashboard design and technical support in setting up these dashboards. Additionally, a catalog of data tools, including associated costs, is sought to help DMOs align their data initiatives with operational needs.
- 3. Capacity Building and Training:** Structured programs for building data literacy were highlighted, with role-specific training for managers and operational staff. DMOs identified the need for both high-level insights for decision-making and technical training on data handling, aimed at varied levels of experience across tourism management.
- 4. Networking and Knowledge Repository:** The establishment of a peer-to-peer network and access to a repository of best practices and relevant research documents were priorities. These resources align with the Competence Centre's objective to act as a central hub, enhancing knowledge sharing and the collective impact of tourism initiatives across Europe.
- 5. Need for Support Across Data Stages:** Respondents outlined significant support needs in all data processing stages—from initial data gathering to insights and actionable steps. This need is particularly pronounced in implementing insights into strategies, with tools and guidance essential to bridge this gap.

As a conclusion, and taking all the information gathered and analysed into account, the following measures and initiatives have been identified aimed to match the information needs of DMOs and SMEs:

### Capacity Building and Skills Development

- **Data Literacy Programs:** DMOs and SMEs indicated a need for structured training programs to enhance data literacy across all levels of experience, supporting both novice and experienced data users in tourism management. This requires a structured program with content on data collection, analysis, and application.
- **Role-Specific Training:** The survey and workshops highlighted demand for role-specific training based on organizational tasks. Courses should cover both decision-making insights for managers and technical data handling for operational staff.
- **Workshops and Webinars:** Interactive online sessions led by experts were preferred, focusing on practical skill-building to facilitate continuous learning in data-driven tourism management. While online formats are widely preferred, a hybrid model that includes regular online sessions and occasional in-person workshops would cater to diverse learning preferences. This approach was seen as ideal for balancing convenience and in-depth engagement.

### Data Management and Technology Utilization

- **Support for Dashboard Design:** The need for destination-wide dashboards was recurrent among DMOs. This includes resources on dashboard design and technical support for setting up dashboards, allowing organizations to visualize key metrics and track performance efficiently.
- **Catalog of Tools and Statistical Resources:** To help organizations select relevant tools, the catalog should include a structured list of data analysis tools, statistics, and their associated

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costs. This would help DMOs and SMEs align their data initiatives with operational and financial requirements.

### Networking and Peer-to-Peer Learning

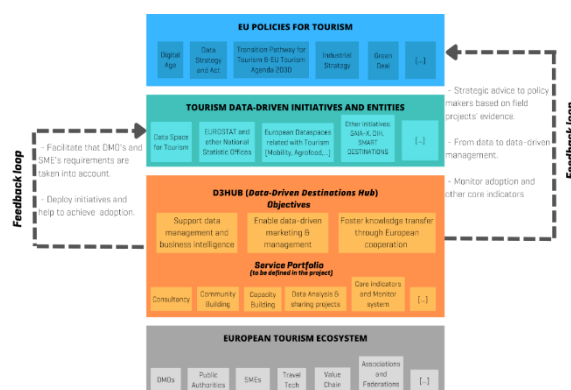
- Network creation activities are another kind of service that the future Competence Center can offer, as they are closely related to the DMOs' requirement to access and share best practices. This aligns with the Competence Center's core philosophy of acting as a catalyst and hub of other EU entities' activities and projects, allowing for multiplied impacts. This service can be developed in WP6: Communication, Dissemination, and Networking.

Mapping the results of this deliverable with other existing EU entities that provide different services to DMOs and SMEs will help to avoid duplication, improve the reach, and boost synergies by maximizing capacities.

- Peer Learning Networks: establishing a network within the Competence Center for peer-to-peer learning would foster knowledge exchange between DMOs and SMEs across Europe. The report noted strong support for forums where users can share best practices, solutions, and experiences related to data-driven tourism.
- Access to a Knowledge Repository: a central repository of reports, case studies, and relevant research documents is essential for ongoing reference and learning, providing a continuously updated knowledge base on tourism data practices and policies. This need aligns with the core philosophy of future Competence Centre of being a central hub where different existing institutions can share their initiatives and projects and help them to disseminate and multiply the results of them reaching a greater impact.
- Given the Competence Center's position as an entity that will sit between Tourism data-driven initiatives and entities and the ER tourism ecosystem, it can play a strategic role in establishing a foresight observatory about the EU tourism needs and requirements regarding destination data-driven management needs. As a result of this close contact with the EU tourism ecosystem, this feedback can provide other initiatives implementing data-driven initiatives, such as the future European Tourism Data Space, and valuable information about the DMOs' and SMEs' requirements, limitations and priorities. It can also provide feedback to other EU policy-making about these requirements and the level of adoption of those policies. Finally, this valuable information can also align capacity training and formation initiatives from Universities, Technological Centers, and other education institutions to bridge the gap between the DMOs' and SMEs' needs.
- The survey and the workshops performed as part of this task 2.2 Information needs and

data requirements of DMOs and SMEs is a clear example of the activities that can produce this foresight observatory.

Figure 17 D3HUB overall vision



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## Data analysis consultancy services

- Guidance and support in data analysis: most of the DMOs have manifested their need to receive assistance in all the 5 data analysis stages of the proposed model: from the initial steps of data gathering, data analysis tools usage to the final steps of insights discovering and action implementation based on data analysis results. This need entails carrying out a more in-depth analysis, probably involving the participation of external experts to assist in the provision of these data analysis consultancies.
- The future Competence Center can provide data services, such as specific data sources, that can be gathered from destinations and shared with other stakeholders, such as other EU entities, through APIs that enrich current existing data sources. During task 4.3 Testing, selected destinations will participate in piloting the preliminary Competence Center's support scheme during 2025. A requirement to be met by participating destinations is the provision of different data sources for sharing within the project framework.

For the qualifications and skills required for external experts complementing partner talent, we can conclude that external experts are crucial in supporting DMOs and aligning with the Competence Centre's objectives. Experts will be selected based on domain-specific and methodological knowledge:

### A. Domain Knowledge

Experts are needed across thematic areas relevant to European tourism, such as sustainable tourism practices, data-driven management, and emerging technologies (e.g., VR/AR). These experts should also understand the technical demands of data systems, including dashboard design and environmental impact metrics.

### B. Methodological Expertise

For effective knowledge transfer, experts should possess skills in conveying complex topics through digital platforms (e.g., webinars and interactive courses). This includes proficiency in tools for data visualization and technical implementation support.

### C. Flexibility and Cultural Competence

Given the diversity of European tourism stakeholders, experts need the flexibility to address varied levels of data maturity and cultural understanding across regions.

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## Annex: Questionnaire

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