DATES

European Data Space for Tourism

D4.3. ROADMAP FOR THE GOVERNANCE FRAMEWORK

**Funded by
the European Union**

03/11/2023

PROJECT INFORMATION

Project Number	101084007
Project Acronym	DATES
Project Full title	European Data Space for Tourism
Project Start Date	1 November 2022
Project End Date	31 October 2023
Project Duration	12 months
Funding Instrument	Digital Europe
Funding Scheme	CSA – Coordination and Support Action
Topic	DIGITAL-2021-PREPACTS-DS-01-TOURISM
Contract	101084007
Coordinator	AnySolution S.L.

DELIVERABLE INFORMATION

Deliverable No	D4.3
Deliverable Title	Roadmap for the Governance Framework realisation
Work-Package No	WP4
Work-Package Title	Governance and Business Framework
WP-Leader (Name and Short Org. Name)	IDC
Tasks No	T4.3
Tasks Title	Roadmap for the implementation and operationalisation of the Governance & Business Framework
Task Leader (Name and Short Org. Name)	IDC
Main Author (Name and Short Org. Name)	Nuria de Lama, IDC
Other Authors (Name and Short Org. Name)	Dolores Ordóñez (ANYSOL), Daniel Iglesias (NECSTOUR), Valentín Sánchez (Tecnalia), Andreas Eisenrauch (Amadeus), Eric Pol (aNG), Olivier Dion (aNG)
Reviewers (Name and Short Org. Name)	Juan Ortells (ANYSOL); Tayrne Alexandra Butler (ANYSOL)
Status	Draft ☒ Final ☐
Deliverable Type	Report ☒ Data ☐ Demonstration ☐ Data ☐
Dissemination Level	Public (PU) ☒ Sensitive (SEN) ☐ EU Classified (EUC) ☐ *PU: fully open (automatically posted online on the Project Results platforms)* *SEN: limited under the conditions of the Grant Agreement* *EUC: WU-RESTRICTED, EU-CONFIDENTIAL., EU-SECRET under Decision 2015/444.*

Date Approved by Coordinator	3/11/2023

DOCUMENT REVIEW HISTORY

Date	Version	Reviewer Name (Short Organisation Name)	Summary of main changes
30/05/2023	V0.1	Nuria de Lama (IDC)	Structure of the document proposed contributions per partner, scope and focus.
09/06/2023	V0.2	Nuria de Lama (IDC)	Revision of contents based on feedback from the f2f consortium meeting in Mallorca and event.
18/09/2023	V0.3	Nuria de Lama (IDC)	Integration of initial contributions by partners
02/10/2023	V0.4	Daniel Iglesias (NECSTOUR), Valentín Sánchez (Tecnalia), Andreas Eisenrauch (Amadeus)	Draft content versions of sections on technical deployment of data space, skills, service ecosystem
30/10/2023	V0.5	Dolores Ordóñez (ANYSOL), Eric Pol (aNG), Olivier Dion (aNG), Nuria de Lama (IDC)	Integration community building, governance, recommendations (draft)
31/10/2023	V0.6	Nuria de Lama (IDC)	Revision, improvements, standard sections integrated, formatting aspects
03/11/2023	V0.7	Nuria de Lama (IDC)	Final version produced for coordinator's approval
03/11/2023	V1.0	Tayrne Alexandra Butler (ANYSOL), Juan Ortells (ANYSOL)	Formatting, final proof-reading, final version generated

FINAL ACCEPTANCE BY COORDINATOR: 3/11/2023

DATES CONSORTIUM			
Part. No	**Participant organisation name**	**Short Name**	**Country**
1	ANYSOLUTION SL	ANYSOL	ES
2	FUNDACION TECNALIA RESEARCH & INNOVATION	TECN	ES
3	IDC ITALIA SRL	IDC	IT
4	MINISTERO DEL TURISMO	MITUR	IT
5	INTELLERA CONSULTING SRL	INTELLERA	IT
6	AMADEUS SAS	AMAD	FR
7	INTERNATIONAL DATA SPACES EV	IDSA	DE
8	ARCTUR RACUNALNISKI INZENIRING DOO	ARCTUR	SI
9	NETWORK OF EUROPEAN REGIONS FOR COMPETITIVE AND SUSTAINABLE TOURISM ASBL	NECS	BE
10	OUTDOORACTIVE AG	OUTD	DE

11	DIH TOURISM 4.0, ZU	DIHT	CZ
12	AVORIS RETAIL DIVISION SL	AVOR	ES
15	ANEWGOVERNANCE	ANG	BE

LEGAL DISCLAIMER

The information and views set out in this deliverable are those of the author(s) and do not necessarily reflect the official opinion of the European Union. The information in this document is provided "as is". Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein. The DATES Consortium members shall have no liability for damages of any kind, including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials, subject to any liability which is mandatory due to applicable law.

INDEX

Index of Figures

Index of Tables

List of Abbreviations and Acronyms	
ADS	Advanced Digital Skills
AI	Artificial Intelligence
AISBL	Association Internationale Sans But Lucratif
BDVA	Big Data Value Association
CSA	Coordination and Support Action
DA	Data Act
DCAT	Data Catalogue Vocabulary
DG	Direction General
DGA	Data Governance Act
DId	Decentralisation Identifier
DMO	Destination Management Organization
DS	Data Space
DSFT	Data Space for Tourism (refers to the sister CSA of dates, hence, project acronym)
DSSC	Data Space Support Centre
EC	European Commission

EDIC	European Digital Infrastructure Consortium
eIDAS	Electronic identification and trust services
ETDS	European Tourism Data Space (refers to the overarching data space for tourism)
EU	European Union
GDP	Gross Domestic Product
GXDCH	Gaia-X Digital Clearing House
HADEA	European Health and Digital Executive Agency
ICT	Information and Communication Technologies
IDSA	International Data Spaces Association
IoT	Internet of Things
IPCEI	Important Projects of Common European Interest
JRC	Joint Research Center
KPI	Key Performance Indicator
MS	Member State
SME	Small and medium-sized Enterprise
TDS	Trusted Data Source
TSI	Technical Support Instrument
UNE	Spanish Association for Standardization
WP	Work package

EXECUTIVE SUMMARY

The focus of D4.3 Roadmap for the Governance Framework is to provide **guidance on how to deploy the European Tourism Data Space (or ETDS in brief), focusing specifically on non-technical elements of the data space**. The document travels through a series of chapters that provide insights into different aspects of the data space, resulting in recommendations for the subsequent phase. Our guidance addresses specifically:

- The implementation of the Governance from a technical point of view, including key concepts of the Gaia-X ecosystem that serve this purpose.
- The implementation of the conceptual Governance model, including governance structure, which should be involved, and a proposal for a suitable governing body, all of their elements that were depicted in D4.2 and further elaborated and clarified here.
- The set up of a service ecosystem around the data space, promoting the network of data intermediaries that could increase the value of the data space and support both data providers and consumers.
- A strategy for capacity building and, in particular, the generation of data-related skills.
- A strategy for stakeholder engagement and the ability to create a critical mass of stakeholders as a key aspect to the sustainability of the data space.

The document includes reflections on the need for collaboration not only to foster interoperability but also to leverage resources and make efficient use of available financial capabilities.

Some of the recommendations featured in D4.3 have been integrated into the so-called Blueprint of the European Tourism Data Space, elaborated jointly between the two projects that have contributed to the analysis of the tourism sector and the corresponding design of the data space: DATES and DSFT.

Readers interested in non-technical aspects of the data space may enjoy additional reading material generated by WP4 of DATES that will allow them to understand the tourism industry (trends, market projections, situation concerning digital transformation, dynamics of the tourism players), the design of the Governance model of the data space, which entails discussions on governance structure, participants, suitable governing body, decision-making, compliance with the regulatory environment, and our work related to business motivations to migrate to a data space ecosystem, i.e. understanding the potential benefits that stakeholders may get from the data spaces in their different roles, examples of business models and impact assessment. The components above are part of D4.1, D4.2 and D4.3.

1 INTRODUCTION

1.1 Objectives and target audience

The document you have in your hands consolidates the views worked out by the DATES project in the last 12 months about how a data space for tourism should look. The focus of D4.3 is to provide **guidance on how to deploy the European Tourism Data Space** (or ETDS in brief), focusing specifically on non-technical elements of the data space since WP3 addresses the technical design and specifications. Some technicalities are unavoidable sometimes, as happens with our recommended approach to deploying the Governance model of the data space, where we include a proposal for a technical framework (based on Gaia-X) plus reflections and recommendations for the more conceptual part of the governance, including decision-making rules, an account on which stakeholders should take part in the governance structure and a model that could foster interoperability and compliance with the complex setting of regulations and legal aspects that will be subject of concern for those organisations using the data space for data sharing purposes. The document travels through a series of chapters that should be considered when going to the deployment phase of the data space. It is worth highlighting that **some of these recommendations have been integrated into** an even more strategic document for the upcoming months, which is **the Blueprint of the European Tourism Data Space, elaborated in a joint manner between the two projects** that have contributed to the analysis of the tourism sector and the corresponding design of the data space: **DATES and DSFT**. In the same way, this document has been fed by knowledge captured in other documents of DATES, combined with other sources and new information derived from the project activities.

While the **direct target audience is the set of stakeholders intending to deploy the ETDS**, the content could be of great interest to **any organisation interested in data spaces in general and tourism data spaces in particular**. Furthermore, readers may not need to go through the full of it and are invited to jump into those chapters that mostly interest them if their area of study is restricted to elements like governance, skills, services, etc.

1.2 Structure and contents of the document

D4.3 starts with some key elements of the context and background that act as drivers for DATES. Even though these concepts may be well known by a big audience, they are summarised and exposed here to make the document self-understandable and help those who are newcomers to the data space ecosystem. In particular, we draft briefly the most important ideas and motivations behind the European Data Strategy and the Transition Pathway for Tourism, both of them coming together in the conceptual definition of the European Tourism Data Space and its objectives.

The document then surfs into the core chapter, which addresses the guidance for deployment of major elements of the ETDS, including the implementation of the

Governance from a technical point of view, where we bring readers through key concepts of the Gaia-X ecosystem that we recommend, but also the conceptual part of the Governance model, i.e., which structure to implement, who should be involved, proposal for a suitable governing body, elements that were depicted in D4.2 and further elaborated and clarified here. Our recommendations also address the need to set up a service ecosystem around the data space, promoting the network of data intermediaries that could increase the value of the data space and support both data providers and consumers, as well as guidance on capacity building and in particular the generation of data-related skills. This chapter also includes some hints on the future steps for stakeholder engagement. The ability to create a critical mass of stakeholders is a key aspect to the sustainability of the data space.

The third section of the document elaborates on the need for collaboration for different reasons. Interoperability is key and will only be fostered through coordination between different initiatives, but we enforce collaboration and cooperation with other projects and programs as a way to leverage resources and make efficient use of available financial capabilities. To end with, the document provides a summary of major recommendations and conclusions that should feed the next steps of the ETDS.

1.3   Relationship to other parts of DATES and methodology

D4.3 is an integral part of WP4, an area of work of the DATES project that addresses specifically non-technical aspects of the data space but is still key to the initiative's success. Major elements of the WP include the **understanding of the tourism industry** (trends, market projections, situation concerning digital transformation, dynamics of the tourism players), the design of the **Governance model of the data space**, which entails discussions on governance structure, participants, suitable governing body, decision-making, compliance with the regulatory environment, and work related to **business motivations to migrate to a data space ecosystem**, i.e. understanding the potential benefits that stakeholders may get from the data spaces in their different roles, examples of business models and impact assessment. The components mentioned above are part of D4.1, D4.2 and D4.3. This deliverable, **D4.4, elaborates further on some of the previous concepts but looks specifically at providing guidance and concrete recommendations on how to deploy the ETDS** without addressing the most technical aspects associated with the different infrastructure levels required by the data space and its participants, which are mainly covered by WP3. As described in section 1.2, the document addresses elements of community building, marketing, or technical implementation of governance aspects. They have been collected by those WPs that work intrinsically in those fields, notably WP3 and WP5. Recommendations and guidance have been derived from the analysis work done by the project throughout this year but have been confronted with a large group of tourism stakeholders, including the inter-ministerial committee, but also several validation workshops organised with our stakeholder groups and an extensive number of additional workshops and events (both virtual and physical) where contents have been exposed to the

audience for discussion and refinement. WP5 accounts for the complete list of activities executed in this regard.

Some of the content has been used to feed the blueprint proposed jointly by the two CSA projects, DATES and DSFT. Similarly, the content of D4.4 has been reviewed after the convergence of the two CSAs into the blueprint for better alignment and coherence.

2 CONTEXT AND BACKGROUND

2.1 European Data Strategy

The main goal of the European Data Strategy is to create a single market for data that will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers, and public administrations. Besides the data flow, the strategy comes with a series of European rules related to privacy and data protection, competition law, and regulations that guarantee fair, practical and clear access and use of data. While access to data should improve the competitiveness of the EU industry, they should not break or neglect traditional European values that put the user/citizen in the centre and ensure fairness in terms of competition and value share. Some of the pillars that should drive in practical terms the effective implementation of the European Data Strategy are:

- Setting **clear and fair rules on access and re-use of data**; here is where we have seen a **very active period in terms of the regulation (DA, DGA**, etc.), all of them tackled in some of our documents like D4.1 and D4.2. as part of the background for the definition of a suitable governance model for the data space
- Investing in **next-generation tools and infrastructures to store and process data**. Great investments in initiatives like SIMPL and associated privacy-led ones like Gaia-X, with institutional and leadership support by Alliance on Industrial Data, Edge and Cloud, and complementary investments by MS, such as the Cloud IPCEI, are proof of this.
- **Joining forces in European cloud capacity**; see examples in the previous point that add to additional investments in high-computing infrastructure.
- **Pooling European data in key sectors with common and interoperable data spaces**; here is where DATES lies, as well as a series of additional sectorial data spaces, all of them collaborating under the umbrella of the DSSC and with support from initiatives like the DSBA composed by Gaia-X, IDSA, FIWARE and BDVA as an attempt to keep alignment and promote interoperability between them.
- **Giving users rights, tools and skills to stay in full control of their data**: data spaces but also other instruments and initiatives are working towards a full user-centricity that respects people's privacy. In a more industrial environment, this translates into the concept of data sovereignty, a key differentiator of the approaches of Gaia-X and IDSA and, thus, of data spaces, which will allow data providers to decide how to share their data, with whom and for which purpose, giving them tools to track the compliance with the contracts that regulate the data use and reuse. This will make a fundamental difference in the data-sharing context, and in our opinion, it will be the cornerstone of a new data era.

2.2 Transition Pathway for Tourism

On 10 March 2020, the Commission adopted a new industrial strategy. The aim was to **help the EU industry lead the green and digital transformations and to boost the EU's global competitiveness and open strategic autonomy.** In light of the experience of the COVID-19 pandemic, the update of the EU industrial strategy highlighted the need to accelerate the green and digital transitions further and increase the resilience of the EU industrial ecosystems. To do so, the Commission proposed launching **transition pathways** that are co-created with stakeholders as an essential collaborative process **to help the transformation of industrial ecosystems**. As the tourism ecosystem was the hardest hit by the pandemic and faced major challenges to achieving the twin transition, it was the first industrial ecosystem in which a co-creation process was launched to develop a transition pathway. The transition pathway for Tourism highlights challenges and actions for the twin transition, specifically in the areas of resilience, sustainable competitiveness, technological solutions and the barriers to overcome for successful deployment, infrastructure, skills, social dimension, investments and funding.

It is not by chance that many of those elements have to do with data, and the document revolves around aspects like:

- **Improving statistics and indicators for tourism**: harmonisation of data collection; extension of indicators to fields like sustainability, of critical importance; interoperability and discoverability
- **Collaborative governance of tourist destinations**: data-supported destination management models
- **Synergy with other ecosystems, also in terms of data sharing**, as they could greatly impact tourism: mentioning diverse sectors like aerospace, agrifood, construction, cultural and creative industries, digital industries, health, mobility, transport and automotive, civil security or retail; for some of them data spaces are either in planning or deployment phase, with some embryonic data spaces already in operational mode.
- **Data-driven tourism services**: stakeholder cooperation to agree on common practices (Code of Conduct) and to actively share tourism-related data in a European data space for tourism, increasing use of data sharing in developing personalised tourism services and destination management, monitoring and service provision, including the creation of new platforms among SMEs, use of artificial intelligence and data-based innovation, such as local digital twins for predictive planning to accurately meet demand and reduce resource efficiency of services.

We could add many others; for readers interested in figures, many challenges, opportunities and trends have been highlighted in D4.4, accompanied by an insightful market analysis where figures allow for comparisons and data-driven conclusions.

Both the European Strategy for Data and the Transition Pathway for Tourism drive and motivate the work carried out by the DATES project.

2.3 The European Tourism Data Space: Concept & Objectives

The two references described above are well considered and integrated into the Communication set by the EC in July 2023, "Towards a Common European Tourism Data Space: boosting data sharing and innovation across the tourism ecosystem". Such document establishes the main objectives of the European Tourism Data Space, referred to in this document very often as ETDS, providing an overarching framework for other data-sharing initiatives in tourism that could also comply with the concept of data space even though they may operate in specific environments defined by geographical coverage, focus-based approach, or sub-segment of the domain.

The objective of the data space for tourism is to combine technical standards for interoperability with a governance structure which invites and allows public and private stakeholders to join efforts to increase data sharing across data domains, as well as across sectoral data spaces and data use in the sector. This, in turn, may greatly benefit the tourism ecosystem and support specific objectives, such as:

- fostering innovation in the sector for business and DMOs in creating, improving and personalising services and offers through access to more quality information, which is not only shared but also easier to find;
- supporting public authorities in making decisions for the sustainability of their tourism offer, marketing and management based on a variety of relevant data;
- supporting specialised companies in providing better services to the market in terms of data analysis, indexes, and market trends;
- allowing SMEs or small DMOs to share their data and information related to services and offer to an EU-wide data sharing framework;
- improving the availability of data sources for producing statistical information for policymakers, businesses or the public interest, fostering integration with and the enhancement of existing official statistics.

.

3 MAJOR ELEMENTS OF THE COMMON EUROPEAN DATA SPACE. GUIDANCE FOR DEPLOYMENT

3.1 Implementation of the Governance Model: Technical view

This section includes a description of the steps needed to deploy a data space governance model from the **technical point of view**, along with some recommendations about the current technological solutions and their expected evolution.

The recommendations are based on the current state of the main data space initiatives in Europe, particularly the Gaia-X initiative, which is the most advanced from the point of view of the technical governance framework and the onboarding process. Most technical building blocks needed to operationalise the governance model are sector-agnostic. However, some specific requirements from the Tourism sector will be highlighted.

First, the "ideal" process of defining and implementing a data space governance framework from the technical point of view is described. The purpose of this first subsection is to provide the context for the recommendations for each step included in the second subsection. Finally, the onboarding process is explained from the point of view of a data space participant.

3.1.1 Data Space Governance Model Deployment

The DSSC conceptual model level 1, included in the DSSC blueprint, defines the main stakeholders participating in the definition and deployment of a data space governance model.
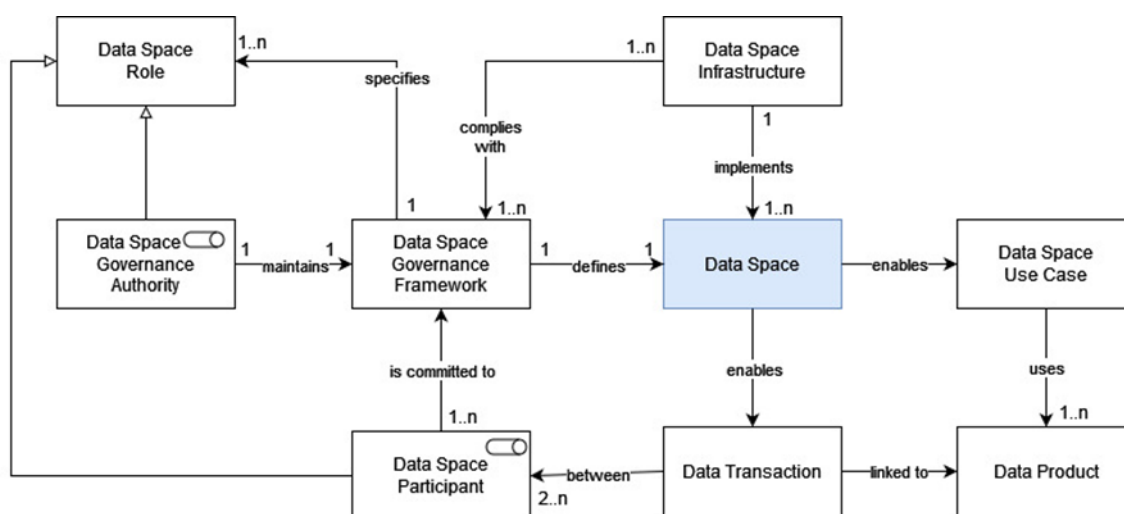

Figure 1 Level-1 conceptual model of a data space (source: DSSC)

.

.

Next, a description of the main concepts taken from the DSSC conceptual model is included. The information is taken directly from the DSSC conceptual model web page, included here for reference, and will be used along the document.[1] The concepts are "data space governance authority", the "data space governance framework", and "data space infrastructures".

Data space governance authority: the role that can be performed collectively by one or more participants accountable for creating, developing, maintaining and enforcing that governance framework. While doing this, they consider the needs of envisaged future data space participants and whatever needs to be 'regulated' because of the purposes that the data space aims to serve. A data space governance authority does not replace or diminish, in any way, the powers of other (e.g., public) enforcement authorities.

Individual data spaces have their **data space governance framework**, i.e. the set of principles, standards, policies (rules/regulations), agreements and practices that apply to the governance, management, and operations of a data space as well as to the enforcement thereof and the resolution of any conflicts. That governance framework should address anything that participants in a particular data space are concerned about and that is within the scope of the data space. Thus, the governance framework defines and distinguishes a data space from others.

The governance framework must also specify the requirements that the organisational, procedural, and technical components, services and data that implement the data space must comply with. These components (such as connectors), services (such as catalogue services or identity services) and data (such as transaction logging schemas) enable the data space to function. Together, they form **data space infrastructures** that implement the data space.

One specific role regarding the data governance process is the so-called (using Gaia-X nomenclature) **clearing house**. Within the data governance framework, it serves as a pivotal component for operationalising data management. According to Gaia-X, the clearinghouse is the one-stop place to go and get verified against the data space governance rules to obtain compliance in an automated way.

The following steps define the roadmap to define and deploy a "generic" data space governance model, along with some specific steps where requirements from the Tourism sector can be added. These steps are highlighted in red.

It is very important to note that this section presents the **technical roadmap to deploy the governance**, which means that the organisational aspects of the data space are not taken into account. For example, the first step is to create the data space governance authority. If

---

[1] Conceptual Model of Data Spaces | Version 0.5 | September 2023 - Conceptual Model - Data Spaces Support Centre (dssc.eu)

this organisation is only one company, a public administration or a consortium is not directly related to the technical approach, so it is not discussed in this section.

1. Define/create the **data space governance authority**.
2. Define the **data space governance framework**.
    a. Compliance process (from the technical perspective)
        i.   Mandatory and optional criteria
        ii. Sector specific criteria
    b. Define data models needed to implement the compliance processes
        i.   Generic models to describe Data products, natural and legal persons, services, contracts and so on
        ii. Tourism-specific data models
3. Operationalize the onboarding process.
    a. Define and deploy the on-boarding services.
        i.   Deploy the necessary **Data Space infrastructure**

The next section describes more in-depth the steps included in the roadmap from a technical point of view. As already mentioned, the recommendations are based on the current state of the main data space initiatives in Europe, particularly the Gaia-X initiative, which is the most advanced from the point of view of the technical governance framework and the onboarding process.

3.1.2 Data space governance model and roadmap: technical solutions

This section provides a more detailed description of the technical solutions available and the challenges for each of the steps in the roadmap.

The general overview of the possible strategies, frameworks and tools for data spaces is not included here. Instead, a pragmatic approach is used, including only the most promising technologies nowadays. A more comprehensive overview of technological strategies applicable to the data space definition and deployment can be found in the IDSA rulebook[2].

3.1.2.1 Gaia-X initiative

Gaia-X aims to create a federated open data infrastructure based on European values regarding data and cloud sovereignty. The mission of Gaia-X is to design and implement a data-sharing architecture that consists of common standards for data sharing, best practices, tools, and governance mechanisms.

From the technical point of view, Gaia-X aims to connect the Data and Infrastructure Ecosystems and relies on three conceptual pillars to achieve that:

*   **Gaia-X Compliance**: Decentralized services to enable objective and measurable trust.

---

[2] Cover - IDS Knowledge Base (internationaldataspaces.org)

- **Data Spaces / Federations**: Interoperable & portable (Cross-) Sector datasets and services
- **Data Exchange**: Anchored contract rules for access and data usage

In concrete terms, for each of these pillars, there are three types of deliverables: Functional Specifications, Technical Specifications and Software.

3.1.2.2 Gaia-X data space governance authority and governance framework

The **Gaia-X European Association for Data and Cloud AISBL** represents the core of the organisational structure. It is an international non-profit association under Belgian law (French: Association Internationale sans but lucratif, shortened to AISBL). It was founded to develop the technical framework and operate the Gaia-X Federation services.

In the context of Gaia-X, **Gaia-X AISBL is the Data space governance authority** defining the data space governance framework for the Gaia-X-based data spaces. This **data space governance framework corresponds with the Gaia-X Compliance pillar of the Gaia-X framework.**

Gaia-X Compliance rules are split into two main subsystems:

1. The **'Trust framework'** – which is mandatory and verifies the existence and veracity of any service characteristics. The mandatory criteria are the following:

   a) serialisation format and syntax.

   b) cryptographic signature validation and validation of the keypair-associated identity.

   c) attribute value consistency.

   d) attribute veracity verification.

2. The **'Policy Rules & Label document** – which is optional and allows to verify adherence to rule sets that fulfil specific market needs.

Those rules apply to all Gaia-X Self-Descriptions, and there is a Self-Description for all the entities defined as part of the Gaia-X Conceptual model described in the Gaia-x Architecture document. This list mainly comprises:

- Participants including Consumer, Federator, Provider
- Service Offering
- Resource

Based on the three basic labels, further Gaia-X Labels can be created to fit new needs, in particular using extension profiles for country and **domain-specific requirements**.

•

Extension profiles can also leverage the labelling criteria by adding and defining on-top requirements for specific purposes.

To ensure the impact and consistency of Gaia-X Labels, new labels and extensions have to be authorised by the Gaia-X Association. Another subsystem can be added to include some sector-specific rules and policies, as is shown in the next figure:
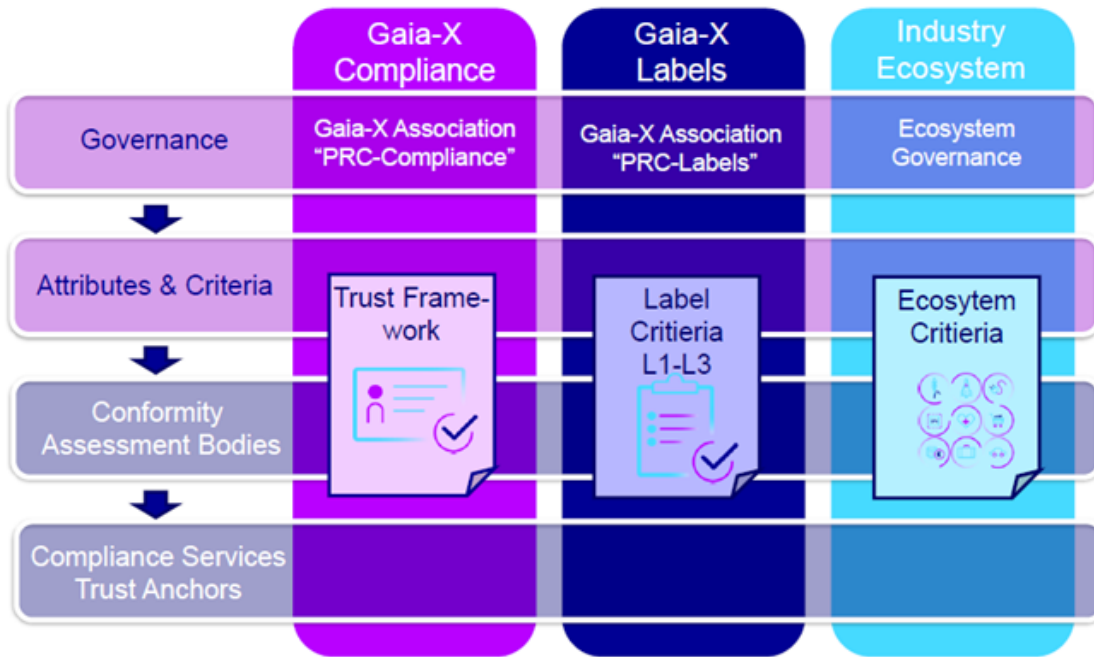
Figure 2 Gaia-X compliance model (source: Gaia-X)

Therefore, this model allows the tourism data space to add any specific criteria valid for Tourism stakeholders.

The current **Policy Rules & Label document** contains criteria only for cloud providers. Gaia-X anticipates that additional rules will be defined for the participants in data spaces and data-sharing ecosystems.

3.1.2.3 *Gaia-X Digital Clearing House (GXDCH)*

To operationalise the onboarding process, a specific data space intermediary or infrastructure has been defined in Gaia-X, the so-called Gaia-X Digital Clearing House (GXDCH). According to Gaia-X[3], the GXDCH is the necessary element to operationalise Gaia-X in the market. The Gaia-X Framework describes functional specifications, technical requirements, and SW assets required to be Gaia-X compliant.

The GXDCH is a network of execution nodes for the compliance components. This safeguards the distributed, decentralised ways of running the Gaia-X compliance, not operated centrally by the Association, and where anybody can benefit from the open,

---

[3] GXDCH - Gaia-X: A Federated Secure Data Infrastructure

transparent, and secure federated digital ecosystem – thus making the Gaia-x mission a reality. It involves a Participant and Trust Anchor Registry, a compliance service and a notarisation service.

1. The GXDCH is a node of verification of the Gaia-X rules;
2. It is the go-to place to obtain Gaia-X compliance and become part of the Gaia-X ecosystem;
3. The GXDCH contains non-exclusive, interchangeable multiple nodes operated by market operators, acting as a Gaia-X Federator;
4. They operate and run services of the Gaia-X Framework (compulsory and optional) necessary to achieve compliance and support the onboarding of any Gaia-X adopter;
5. They integrate external TA (Trust Anchors), including CAB (Conformance Assessment Bodies), for external asseverations, Identity Verification (like eIDAS), and other TDS (Trusted Data Sources) as defined by the AISBL.

The following figure shows the current set of GXDCH nodes:

Figure 3 GXDCH nodes (source: Gaia-x)

3.1.3   Data space governance model: The data space participant perspective

One of the main challenges we face is to explain to companies, especially those without technical skills, the data space concept and how the "data spaces" paradigm is different from previous data-sharing approaches. Furthermore, it must be clearly demonstrated what the real benefits of using the data space approach are and how it can improve data valorisation both inside the company and externally (deep elaboration of such benefits and value organisations could get by migrating to the data space concept have been included in D4.4).

The conceptual model and building blocks approach provide a good and detailed overview of the main concepts like trust, data sovereignty, interoperability, business models and data governance, but they do not give a non-technical overview of the data space processes, i.e., the steps a company must follow to participate in a data space either as a data provider or as a consumer. The main concepts are easily understood, but the operational level, how they apply to the data-sharing processes, is not so clear.

Explaining the data space concept as a "participant journey" is very helpful in understanding how the building blocks cooperate to provide the whole experience of sharing data in an interoperable and standardised way.

The main steps of this journey, which can be considered the main phases of the data space engagement life cycle, are the following ones:

- **Onboarding**
  - Participant
  - Data product/service
- **Publish/search/purchase**
  - Data
  - Services
  - Applications
- **Data products/services**
  - Provider (offers the data/service through the catalogue)
  - Consumer (accesses the data/service from the catalogue)
  - Owner (the holder of the rights to access and use the data/service)
- **Monitoring**
  - Tracking the data exchanges and contract fulfilment

This section describes the steps a participant should follow to onboard in a Gaia-X compliant dataspace. Although the technical details are Gaia-X specific, the general steps can apply to any other data space following the Self Sovereignty Identity approach.

The **first step** is selecting a clearinghouse to formalise the onboarding. Next steps can be done with the wizard developed by Gaia-X: wizard.lab.Gaia-x.eu/userGuide

The **second step** is to define the participant entity and follow the compliance process for the participant.

If the participant is a data provider, the data service offerings must be defined and included in the compliance process.

A generic compliance process includes the following steps:

1. Generate a DID (Decentralized Identifier) for each entity participating in the data space.
2. For each entity, create a self-description according to the format defined by the data space governance authority.
3. Call the compliance service of the clearing house to get the signed, verifiable credentials.

Once the onboarding process is finished, the participant can start publishing or finding services using a data space catalogue and participating in data transfer processes.

However, these steps are only a small part of the overall journey. Companies need to understand that the journey begins long before they get into the process of engaging in a

data space. The journey starts when the company begins to manage data like any other company asset. However, most companies do not manage their data in the same way there is no comprehensive management of data, including the processes needed to maintain data clean, up-to-date and ready to be shared. Even the definition of "quality" data is not clear. Unfortunately, most data space initiatives do not consider this first step.

From a technical point of view, if a company wants to participate as a data provider, it is necessary to create a data product and install the available connectors to provide the data service.

3.2   Implementation of the Governance Model

While the previous section focused on the technical implementation of the governance model, this part of the document revolves around the non-technical elements for the deployment of the governance model, whose definition was anticipated in D4.2, with the Rolebook and Rulebook as major elements of the proposed ETDS Governance.

3.2.1   Data Governance Rulebook

The **data space governance authority** is the body responsible for creating, developing, maintaining, and enforcing a governance framework: the policies and rules of the data space, the so-called **data space governance framework or Rulebook**. The responsibilities of the ETDS governance authority include:

- According to the decision-making process of their choice, defining rules and policies (data space governance framework)
  - for becoming a data space participant
  - for services
  - for resources
  - for intermediaries
- Define/implement the onboarding process (issuing membership credentials)
- Regulate the membership lifecycle (participant discoverability, verification)

The Rulebook represents all ETDS participants. Every entity taking part in the ETDS has to follow the compliance process defined by the data space governance authority.

These rules included in the Rulebook encompass:

- **Hard law**: EU and member state legislation that directly or indirectly relates to data or data sharing[4].
- **Soft law**: Standards, codes of conduct, guidelines, etc., that are not legally binding. Soft law rules cover a wide range of issues, including technical, business, ethical and security.

---

[4] Details on hard law, soft law and other internal rules are not provided here, since full account of regulations and legal aspects was considered in other project deliverables, notably D4.1 and D4.2

- **Internal rules**: Rules developed specifically between participants in a data space, such as business regulations/agreements and context-specific data standards and policies.

The **data space governance authority** ensures that the Rulebook contains relevant regulations (hard law), helps the data space participants to agree on common standards and guidelines for implementation (soft law) and allows them to decide on internal rules.

Data spaces are innovative and complex projects that often move through unexplored terrains. As such, they are still in an open-ended development phase, often requiring pivoting and refinement. The governance of the data space initiatives needs to be flexible enough to allow for such iterative development.

Compliance with the ETDS Rulebook creates trust in data sharing among data space participants. It ensures that trust components, such as business agreements, contracts, authorisations and consents, are respected by all parties. When collaborating with external entities, assessing the compatibility of joint use cases with the rules of the different data spaces involved is crucial. Infrastructure providers that enable data sharing through technology must also comply with the regulations detailed in the Rulebook. This approach prevents technology players from imposing their own policies without consultation with the communities involved.

3.2.2 The Rolebook

The Rolebook is an open, transparent, and dynamic registry of roles and bodies involved in data sharing. Role refers to the set activities that the one performing the function is expected to do. Rights and duties (obligations) can be associated with the role. Bodies are formal or informal organisations participating in the data-sharing governance processes by creating, implementing, or enforcing the rules. The Rolebook would comprehensively document 'Who does what' and 'Who decides what' and establish an interconnected network of data-sharing decision-making entities.

The Rolebook aims to increase clarity and enable stakeholders at all levels (EU, Member States, data spaces) to easily map the current data governance structures and their respective scope. Together with the Rulebook approach, it provides a comprehensive framework for European data governance. The roles and bodies presented in the Rolebook could be referenced from the Rulebook and vice versa. The Rolebook would also build a common understanding of the possible policy interventions needed to ensure the continuity of those roles and functions that are evaluated critically from the perspective of resilience and a functioning market.

The Rolebook will map all key players of the EU data-sharing ecosystem at all levels, not only those related to the tourism sector. All the key documents containing rules (regulations, standards, guidelines, code of conduct, etc.) will be published in an open rulebook library using the ODRL format.

Tourism data space initiatives will be able to reuse all elements of the open rulebook library, connected to the ETDS Rolebook, to build their own data space rulebook.

The following figure illustrates an example Rolebook and Open Rulebook library for the creation of the Rulebook of a mobility data space in Finland that could be well applied to a tourism data space:
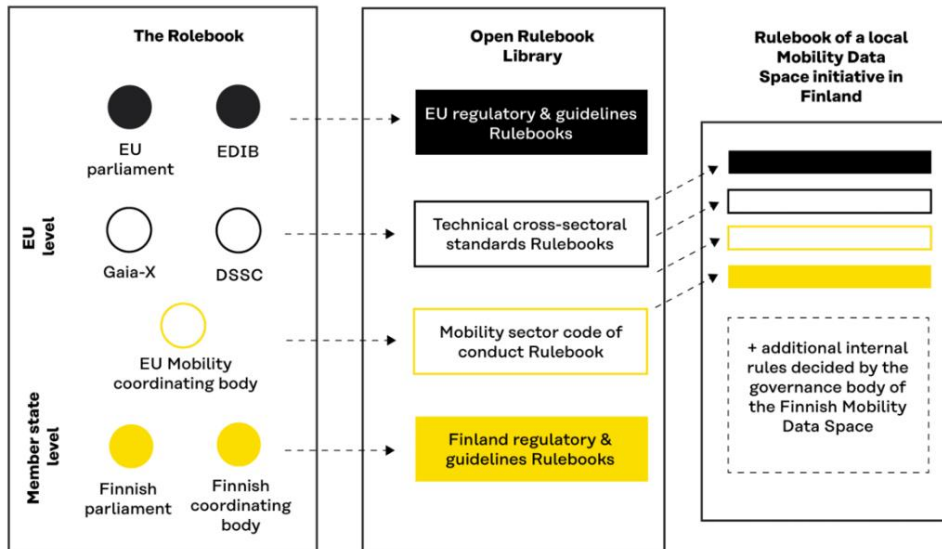
Figure 4 Example data space Rolebook and Rulebook

3.2.3 Data Governance Authority

There are multiple choices for setting up the formal representation of the governance of a data space, which, among others, include:

- Contractual arrangement with no formal entity
- Government agency (public)
- Association
- Private Company
- Cooperative
- Others

While there is no one-size-fits-all solution, the decision regarding the legal status of the data space governing body depends on the following:

- The mission statement of the data space (general/public interest, economic interest, etc.)
- The scope (national, regional, local, sector segment, etc.)
- Vision and preferences of the diverse data space participants.

Each option has drawbacks and advantages:

- **Contractual arrangement with no formal entity**: faster to put in place but complicated to deal with liabilities. DATES does not recommend this solution.

- **Government agency:** large reach and political impact, but not best suited to private sector players.
- **Association:** This solution adapts well to public/private projects and allows for easy onboarding of new members but can present difficulties in raising funds and might need complementary structures (e.g., private operating companies) for dealing with more operational/financial aspects.
- **Private company**: private actors might struggle to reach an initial agreement. Other challenges include complicated onboarding processes and difficulties in involving public sector stakeholders.
- **Cooperative**: governance constraints might be too stringent and may present difficulties in raising capital

Based on different activities conducted by DATES (validation workshop with the stakeholder forum, feedback from events) and confronted with a large survey run by the Data Space for Tourism project, European tourism stakeholders show a strong preference for public or non-profit legal status of the ETDS. While this form could be more suitable for the overarching European data space, other (more regional or topic-focused tourism data spaces) may test different implementations.

3.2.4 Decision-making

Internal decision-making processes (who has the decision-making (voting) rights and how these should be cast) may also adopt many variations. A sample of possible options include:

- One voting right per member.
- More voting rights for early members
- More voting rights for specific kinds of members (e.g., public players)
- Voting rights relative to capital ownership
- Voting rights relative to the members' activity in the data space (e.g., how many data assets are shared, etc.)
- Voting rights relative to the contribution to the data space (e.g., contribution to the technological infrastructure, etc.)

Because of the specificities of the tourism industry and based on the findings of DATES (recommendation promoted to the common blueprint of the ETDS), we recommend the creation of an EU-level Tourism Coordinating body. This applies mainly at the European level (so, as mentioned, the ETDS), where coordination complexities arise, as described below. The rationale is also based on the preference for public or non-profit nature of the potential organisation taking responsibility for the governance of the ETDS.

3.2.5 The opportunity for an EU-level Tourism Coordinating body

The key organisations involved in the ETDS management include the European Commission, Eurostat, national statistics offices, research institutions, the DSSC, and non-governmental organisations. In the medium term, an interface with the DSSC needs to be created to ensure seamless interoperability with other data spaces. It is also key to ensure

representation of the private sector, including both large businesses and SMEs and micro-enterprises. In the public sector, destinations also have a key role to play since most initiatives will materialise at the local level. We believe that none of the aforementioned organisations should manage the ETDS alone. Instead, it should be governed by a consortium of experts from those and led by European-level organisations endorsed by the European Commission. Hence, ETDS's governance could be a two-tier model consisting of a Data Space Governing body overseeing the strategic development of the data space and the expert working groups managing the data space on the tactical and operational levels. As such, it would represent a participatory, inclusive structure with strong involvement at the institutional level.
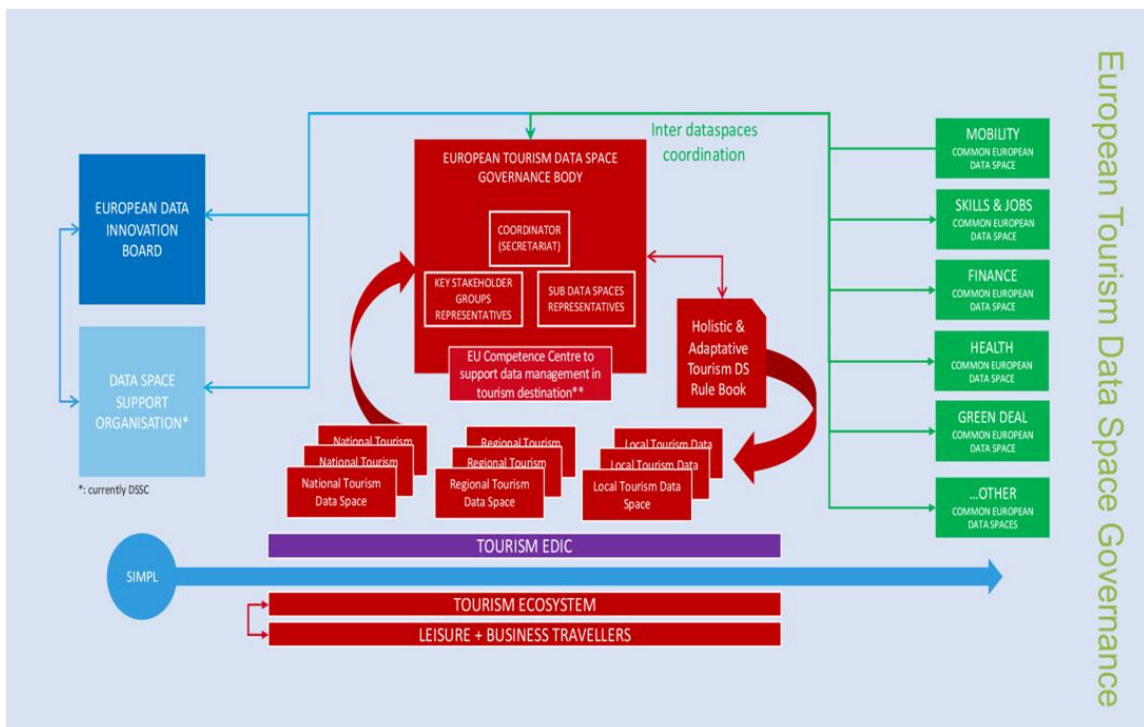
Figure 5 Proposal for the Governance Structure of the European Tourism Data Space

At the operational level, it is recommended that the ETDS coordinating body is supported by participatory working groups composed of tourism experts representing a diverse range of public and private tourism stakeholders. The role of the expert working groups is to develop data quality standards and methodologies, set up transparent and accessible data exchange processes, share use cases and best practices, and provide expert support and education to the ETDS participants. This participatory structure would create a level playing field for the diverse tourism stakeholders (e.g., SMEs), promote democratic decision-making, and enable bi-directional communication between the data space governance and the participants. Importantly, the openness and accessibility of the data space system should not compromise its stability.

To ensure the sustainability of ETDS and its governance body, its business model could envisage the following range of services:

Research and Data Expertise: Research institutions can bring their expertise in data analysis, modelling, and research methodologies to the governance structure. They can contribute to data-driven insights, market analysis, and evaluation of the impact of data initiatives in the tourism industry. Research institutions can also collaborate on joint research projects to advance knowledge and practices in tourism data management.

Technical Expertise and Standards Development: Institutions with technical expertise, such as standardisation bodies or technology research centres, can support the governance structure by providing guidance on technical aspects of data management. They can contribute to developing industry-specific data standards, interoperability frameworks, or data exchange protocols relevant to the tourism sector.

Collaboration and Networking: Institutions can facilitate collaboration and networking opportunities for the governance body. For instance, EU bodies may organise events, conferences, or workshops where stakeholders from the tourism industry and relevant institutions can connect, exchange knowledge, and share best practices. These collaborative platforms foster partnerships, facilitate knowledge exchange, and contribute to the credibility and visibility of the governance structure.

Advisory and Consultative Roles: Institutions can serve in advisory or consultative roles within the governance structure. They can provide expert advice, guidance, and strategic insights on emerging trends, technological advancements, and policy developments in the tourism industry. Their input ensures that the governance body remains informed, up-to-date, and aligned with the broader industry and regulatory landscape.

Evaluation and Impact Assessment: Institutions can contribute to evaluating the effectiveness and impact of the data space governance initiatives. They can conduct independent assessments, impact studies, or audits to assess the outcomes, benefits, and challenges associated with the governance structure. This evaluation helps ensure accountability, transparency, and continuous improvement of the data space governance efforts.

Some of the aforementioned roles (e.g., advisory, collaboration) can be fulfilled by data intermediaries (compliance with DGA and neutrality of data intermediaries should be sought) that help to create efficient and ethical conditions for data sharing. This is further elaborated in the next section, where the convenience -and need- of developing a service ecosystem in the data space is discussed.

3.2.6   Recommendations for setting up a suitable Governance for the ETDS

Looking at the future deployment of the ETDS and wrapping up the reflections of this chapter, we summarise here major recommendations for the next phase, which have been brought to the common blueprint as elements of agreement between the communities designing the data space.

Membership of the European Tourism Data Space (ETDS): the following actors should be involved or represented in the governance structure; notice that this refers to the

overarching data space that links different data sharing initiatives; this means that data spaces configured and operated at various levels could apply other (still interoperable based on the above requirements) governance models.

- European Commission
- Eurostat and representatives of national statistics offices
- Sectoral research institutions
- Sectoral non-governmental organisations
- Representatives of destinations
- Representatives of the tourism industry
  - Large businesses
  - SMEs
  - Micro-enterprises
- Representatives of local, regional or national data spaces

Operational governance for the ETDS

- Draw a purpose/mission statement for the ETDS; specify what it is not.
- Set decision-making, transparency principles and how ethical questions will be addressed (when relevant). In that case, ETDS may want to establish an external Ethics committee to avoid any conflict of interest.

It is critical that **the value of ETDS is assessed and measured** to help it develop and attract new members. Value generated by the data space should not only be transparently measured but also communicated in effective ways:

- Measure continuously the value created by ETDS.
- ETDS may consider asking aspiring members to report on specific KPIs to gain access.
- Regularly audit the efficiency and development of ETDS, referring to the initial purpose to ensure the right governance is applied.
- If differences are identified, the governance body should take action. This can be through adaptation to the governance rules, ensuring that the purpose is followed.

Legal Entity acting as data space governing body

- It is crucial that the ETDS governance body has a legal entity.
- Format should be collegial (i.e., no founding members with favourable voting rights)
- European cooperative form (SCE) can be considered as an option.
- A variety of business models (e.g., membership, subscription, or access fees) should enable access to all. Check D4.4 for additional options.
- In any case, a business model (or several) should be drawn to ensure ETDS sustainability over time.

3.3 Development of a Service ecosystem

Thanks to the numerous activities developed with stakeholders in the last year, we have learned that data is only one of the elements of the picture. Through various documents published by DATES, readers can see that we often point out that most companies operating in the tourism industry are SMEs and even micro-SMEs, which has a big impact on the readiness of organisations to benefit from data spaces (availability of infrastructure, technology, skills) as well as financial and human resources to develop the tasks that are needed (e.g. as a data provider, data sets should be of high quality, be prepared for compliance with rules and requirements of the data space). Furthermore, earlier on in this document and highly emphasised in D4.4, we argue that many companies may still need to go through the process of qualifying their data sets as real assets of the company and treat them accordingly, with their value, pricing, the risk associated with sharing them, etc. All these challenges call for the availability of a service ecosystem around the data space where companies that do not have the preparedness or resources to "plug and play" in the data space can enjoy support services. Going beyond that, and once the data-sharing transaction happens, we also see the need to provide analytic services since those analytical capabilities are also lacking in many cases. Fortunately, all these possibilities are contemplated as part of the data intermediary role, where we envisage new opportunities for existing players and even the birth of new roles and services as part of developing such intermediation and service layers. D4.4 dives into such roles and business models that may accompany these new services. In any case, it is of utmost importance that operational and business models are suited to the needs of less favoured players since data spaces should contribute to creating a fair level of competitiveness and should not create additional gaps. Those concerns and associated services to tackle them are explained below.

3.3.1 Typologies of services needed to make the data space operational

Besides the core features of a data space, to provide a trustful and efficient ecosystem for data sharing, some additional services might be required to facilitate the achievement of the intended goals. Their provision might be expected by participants, and its implementation could lead to increased attractiveness and acceptance of the data space. Therefore, those services can be seen as propositions of added value to the participants of a data space, and they are, thus, in a certain sense, elements of the overall business model of the data space.

Easy onboarding (process, guidance, tools, Connector aaS)

The data space is a quite new concept, coming along with new technology that is not yet known or fully understood by the majority of the (SME-)players in the tourism sector. There are various reasons for the uncertainties that stand in the way of registering easily in a data space: lack of knowledge about the philosophy of the data space paradigm at all, about the "reality" of trust and data sovereignty; worries about the understanding of the new technology; uncertainty about data to offer and (own) feasible use cases; doubts about the economic sustainability of participation in a data sharing ecosystem.

.

Such increasingly mentioned barriers to entry into a data space could be lowered by a multifaceted, comprehensive, and consistent "onboarding service". This service needs to consider that "onboarding" comprises two phases: the registration of a new member of the community, followed by the (technical) introduction of the participant on the platform. Therefore, such a process needs to have organisational as well as technical elements (specific examples within the Gaia-X framework were depicted in the previous section):

- Internal process definition: Procedure describing the steps, the involved roles and the applicable rules for onboarding a new participant, from the first contact until approval of the membership. This must include the definition of required (verifiable) credentials which each candidate must provide and criteria regarding (dis)approval of an applicant.
- Guides for the participants: The process, the contacts and all criteria for approval should be transparent to parties interested in registering to the data space community, including the technical prerequisites.
- Tools for registering as a member of the community, followed by technical onboarding to the platform: On a mid-term scale, a tool for online registration should be provided that is connected to an internal application for assessment and approval of the candidates. The data collected from each candidate should be aligned with the data needed to prove a trusted identity on the data exchange platform (verifiable credentials). The data should be automatically transferable from the registration tool to the IAM of the data exchange platform. Support for the setup of proper self-descriptions of the parties in the form of verifiable credentials and set up of connections to the relevant trust anchors.
- Easy-to-install software for the participants, leading to installation consultancy. The connector software, which each participant needs to install on its own premises, should be provided as an easy-to-install bundle (i.e. Connector-as-a-Service, CaaS). Any installation step must be described in detail within a guideline document that will enable even inexperienced participants to install and configure a connector. For emergency cases and non-standard installation situations, consultancy services should be available (e.g. from a tech team).

It should be part of the communication concept of the data space authority to provide the applicants with the required information about all available support for onboarding at the time of the first contact.

Assistance for data exploitation

Many parties interested in sharing data in a data space have worries about the feasibility of technical and "semantic" connection of their data to the desired ecosystem. Especially the preparation of data held in legacy or custom data storages for becoming shared in a modern data space is not trivial and might need support. Especially the following aspects should be regarded:

.

- Guide to correct descriptions of the data and access/usage conditions (DCAT and ODRL support)
- Assistance for the adaptation of legacy data formats to the recommended data formats of the data space
- Assistance for the implementation of appropriate data transfer protocols

At first glance, this may be predominantly a problem of small and medium-sized enterprises, but even big companies might need support to prepare their data. The automotive supply chain data space Catena-X eventually created a working group for the onboarding of large enterprises, which have numerous data sets to adapt to guide them to handle the challenges mentioned above. Such a **working group of experts with the relevant experience should be established as soon as the semantic and technical standards for the data space have been decided.**

Community (standardisation, use case "fair", common app evolution)

The data space authority might facilitate the formation of communities of practice for some topics that might be of common interest. The participants' assembly should decide on the appropriate format for each topic (i.e., permanent working groups, limited projects or task forces). Obvious topics where joint discussions and decisions are beneficial for all stakeholders of the data space are:

- **Standardisation requirements**
  Interoperability is assured only by agreeing on common standards on all levels of interoperability (legal, organisational, semantical, technical). Intra-data space standards should be decided on in an appropriate internal format. Representatives of topic-specific working groups should be delegated to participate in similar cross-platform/cross-sector standardisation initiatives to ensure inter-data space interoperability.
- **Use case evolution**
  The data space paradigm assumes that available data might stimulate the generation of innovative use cases and vice versa; the proposal of promising use cases might attract the right data providers. However, the generation of use cases is surely facilitated by direct contact between potential partners. The data space authority should offer a service where use cases could be proposed and discussed to facilitate the formation of use case implementation projects. This could take place, for example, in dedicated use case presentation workshops.
- **Implementation of commonly used applications**
  The same holds for applications which might address common requirements of several use cases. Their identification and implementation could be organised in regular discussions in a permanent working group headed by a representative of the data space authority as a neutral moderator.
- **Support for legal issues**
  Compliance with legal regulations might be a challenge for participants who are experts in the tourism business but not in the specificity of data sharing. The data space

authority should consider organising either professional legal support or a community of legal experts from experienced participants to provide the participant's community with guidelines and case-specific consultancy, even though the governance of the data space, including its compliance rules, should lower this barrier and ensure complete fit with the regulatory environment. Previous work in D4.2, which includes our proposal for the data space governance, shows how different properties could be inherited from different levels and data spaces to foster interoperability and ensure completeness of regulations, including those of the data/AI ecosystem and those related to tourism that may be relevant at different geographical levels).

3.4 Stakeholder Engagement: Towards Critical Mass

As defined in D4.2, the different actors of the tourism industry should be represented in the ETDS.

Figure 6 Tourism data space ecosystem illustrating the multiplicity of stakeholders

The figure above shows how complex the Tourism ecosystem is. In fact, it is even more complex than shown. Most companies in sub-sectors (catering or airlines, for instance) are represented by associations at local, regional, national and European levels. The same applies to staff, public authorities, and tourists. The maturity of the tourism industry varies from one country to another and even at regional and local levels.

Collaboration with the public administration is also a key element, and the implementation of smart destination strategies is crucial to generate data-driven initiatives that contribute to realising a real data economy in the territories. Countries such as Spain started a decade ago to define a Smart Destination Strategy at national level to be implemented at destination level, supported by UNE rules (UNE 178501 and the following ones).

This section intends to illustrate the steps taken and results achieved by DATES towards the creation of a representative community for the data space while pointing out the actions to be undertaken for the onboarding of a sufficient number of organisations that allow the data space to become attractive and enjoy platform effects.

3.4.1 Community of Practice developed

Coalitions workshops are explained in D5.2 in more detail. The Coalition is defined as a group of stakeholders with key competencies in tourism and data consulted to collect evidence and validate the project's main results during the project's timeline. The meticulous construction of the Coalition group involved gathering stakeholders with critical competencies in both the tourism and data sectors, all of whom have willingly agreed to participate in validation activities. This diverse assembly of contributors comprises members sourced from the project's network committee and associated partners. Furthermore, additional essential stakeholders have been included in the coalition as a result of various interactions and project-related activities.

Synergies with other Data Spaces. Tourism is one of the most transversal industries, and its activities are directly related to the implementation and development of actions in other verticals. For this reason, DATES has been not only in contact with other Data Spaces, but its partners are directly involved in other Data Spaces:
- DS for mobility, in which Amadeus and IDSA are involved.
- DS Cultural heritage, represented by ARCTUR.
- DS Green Deal, represented by IDC.
- DS Energy, represented by Tecnalia.
- DS for Smart and Sustainable Cities and Communities, thanks to the involvement of IDC in its stakeholder group.
- EONA-X, in which Amadeus is involved.
- Feasibility study for a media dataspace, where Intellera Consulting was involved.

Data Space Support Center: DATES partners have been involved in the Community of Practice Created and in the specific working groups created, including those of technical aspects, governance and business. n the one related to Governance.

Sister project. The Data Space for Tourism project (DSFT), DATES' sister project, has been instrumental in the elaboration of the final Blueprint of the data space. DATES has collaborated with it very tightly, especially in the last months. This has enabled the consideration of views from a greater base of potential users of the data space, hopefully leading to a more accurate and representative vision and design of the data space that will facilitate the onboarding of more players.

Inter-ministerial Committee. The Ministry of Tourism, acting as a partner of the project, together with the Spanish State Secretariat for Digitalization and Artificial Intelligence as a co-coordinator, was entrusted by the Consortium to establish an Interministerial Committee comprising different public entities for Tourism and Digital Transformation from various EU Member States.

.

The primary objective was to harness the power of data for the benefit of the stakeholders and, more broadly, to contribute to Europe's leadership as a digital, resilient, and sustainable tourism destination. Main attention was put on aspects of privacy, data protection and sovereignty to allow fair access to data and their use and suitable conditions for all actors in the value chain of the tourism industry. Fifteen EU Member States have joined the committee (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Lithuania, Malta, Poland, Portugal, Spain, and Italy).

Synergies with other initiatives: There are several initiatives, programmes and projects with which DATES have been in contact, organising meetings, joint events and participating in conferences. The networks in which the partners are participating have also greatly contributed to generating a great ecosystem, making DATES very well-known and providing the basis for building a potential base of data providers, consumers and intermediaries.

3.4.2 Communication Plan and Onboarding Strategy

Due to the complexity of the tourism sector in terms of the different types of entities involved, it is important to set a communication plan able to explain what a data space is easily, and especially, which are the benefits. We have attempted to clarify this through several deliverables, especially D4.4. However, work is still to be done, and the terminology used in the framework of data spaces is not always easy to understand. That is why the glossaries generated by the DSSC and by DATES (available in D4.1) should be considered a key element to elaborate the future communication strategy.

A thorough marketing and communication plan should be worked out in the next phase of the deployment of the data space, addressing -from a communication viewpoint- concerns like lack of trust or lack of knowledge, aiming to push the involvement of more entities. All in all, the marketing plan should focus on these axes:

- **Attracting a sample of frontrunners in the tourism sector that fulfil the different roles of the data space:** they should be the first testers in the deployment phase, helping to fine-tune the different elements of the data space. Here, it is especially important to establish a piloting phase that illustrates the practical aspects of implementing some of the most appealing use cases (extensive work has been done in W2 that should serve as a reference for prioritisation of data sets and use cases for a value-driven approach)
- **Creating awareness and "accompanying" a bigger community, aiming to prepare a subsequent phase for engaging members**, and in particular for onboarding a representative base of data providers, data consumers and data intermediaries. Data and data services are key to making the data space a tool for real competitiveness. Critical mass and variety are important elements to increase the value proposition and develop a fruitful data ecosystem. The strategy to recruit users in a data space should consider adapting narratives to the different needs of stakeholders and to the perception of the value that participation in the data space

could offer. Potential tools could be various user stories and modular value propositions, depending on the profile.

- **Applying community management techniques to retain users** and manage expectations of organisations already engaged in the data space, focusing on maximising the value perceived and achieved by each member.

Simple and effective messages should be the driver of these actions, together with the appropriate selection of tools and channels. The communication and marketing strategy and operationalisation plans should be well integrated into the governance model of the data space, including impact assessment methodologies and continuous evaluation of KPIs.

3.5 Capacity building: Strategy for Skills development

When we work on the deployment of a complex IT system, we tend to focus on the technical aspects of the solution (in fact, DATES has devoted extensive work to the technical analysis of the existing approaches in WP3), understanding that there is a value and need to address non-technical aspects, but rarely tackling them in depth. In other complementary documents of this project, we have specifically covered the governance (D4.2) and business (D4.4) aspects of the tourism data space, but there is a unique component that is not being addressed properly in the context of data sharing, and thus, affecting the adoption of data spaces despite the recurrent references to its relevance. We talk about the need to develop data-related skills or, in a wider sense, the need to undertake a capacity-building strategy. In this section, we want to pay attention to this challenge and derive some recommendations for the deployment phase to accelerate the inclusion of organisations in the data space operations (especially looking at SMEs). Strategies should generally include upskilling and reskilling.

3.5.1 Digital skills in Europe: current situation and forecast.

2023 is the European Year of Skills, which is a Commission initiative to help companies, in particular small and medium enterprises, to address skills shortages in the EU. As such, it promotes a mindset of reskilling and upskilling, helping people to get the right skills for quality jobs. Among other goals, Member States have endorsed the EU 2030 social targets that at least 60% of adults should participate in training every year. They also set that by 2030, at least 80% of all adults should have basic digital skills, and there should be 20 million employed ICT specialists in the EU, while more women should be encouraged to take up such jobs.

77%	20 million	60%
Of EU companies report difficulties in finding workers with the necessary skills	ICT specialists should be employed in the EU by 2030	Of adults should participate in training every year by 2030

Figure 7 Figures of ICT skills in the EU, including targets and challenges (source: European Year of Skills 2030[5])

In the fast-evolving landscape of the digital age, Europe stands at a crucial crossroads, facing a pressing challenge: the **scarcity of advanced digital skills**. This scarcity threatens to impede its progress and competitiveness in the global arena. To ensure a thriving economy and a cohesive society, Europe must develop comprehensive strategies to **address this deficit and foster a pool of highly skilled individuals**.

In this digital era, technology is rapidly transforming industries and creating new opportunities (we see that very clearly in the context of data-driven transformation). Advanced digital skills are not merely an advantage but a necessity for businesses to remain competitive and innovative. From artificial intelligence to blockchain, the demand for expertise in these domains is skyrocketing. However, Europe currently lacks professionals proficient in these cutting-edge technologies.

The impact of this skills gap is profound. A shortage of digital skills stifles industrial growth and innovation, hindering the potential for high-value job creation. As European industries become increasingly digitised, failure to bridge this gap may result in a widening disparity between the skill requirements of the job market and the actual capabilities of the workforce. Consequently, this could lead to unemployment or underemployment, affecting the overall prosperity of our society.

To address this challenge, Europe needs a multi-faceted approach. Investment in education and training programs focused on advanced digital skills is paramount. Collaboration between governments, educational institutions, and private sector entities is necessary to develop curricula that align with the rapidly evolving demands of the digital world. Additionally, initiatives to upskill and reskill the existing workforce should be prioritised, enabling individuals to adapt to the changing job landscape.

Furthermore, fostering a culture of innovation and entrepreneurship is vital. Encouraging startups and small businesses in the tech sector can stimulate economic growth and provide a platform for individuals to utilise their digital skills effectively. Incentives for research and development, coupled with favourable regulatory environments, will attract talent and promote innovation.

---

[5] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-year-skills-2023_en

We think that data spaces can contribute to developing a more innovative data landscape in the EU, but the benefits of such an instrument will only be realised if the skills challenge is properly addressed.

The DIGITAL project Leading Europe's Advanced Digital Skills (LEADS[6]), where IDC is a major partner, is responsible for identifying future demands in advanced digital skills and the actions required to support the Digital Decade targets of over 20 million ICT specialists. LEADS has developed a framework based on the tech adoption predictions for the areas of Cloud, IoT, BI/Data Science, Artificial Intelligence, Cybersecurity, and Quantum. It leverages significant amounts of market data, which tracks over 150 key use cases across the industry to provide demand predictions. In the last months, LEADS has published key forecasts for the market adoption of over 80 tech groupings to 2030. Those predictions indicate that the demand for skills in cloud infrastructure, cloud integration and APIs and IoT analytics will triple in a few years, while **the demand for skills in data analysis, AI application development and AI implementation will even multiply by 4** (see figure below).
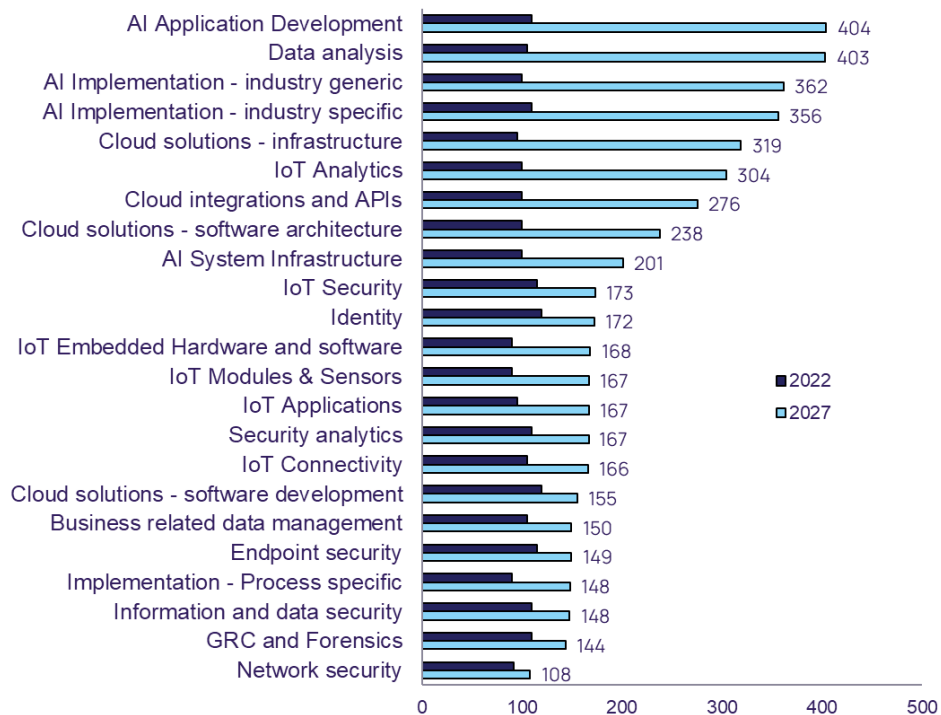

Figure 8 Top skills demands. Predictions for growth of the demand in 2027 with respect to 2022 (source: LEADS project)

The table below reinforces the message of the high risk associated with an increasing gap between supply and demand in such areas (with AI and data in leading positions).
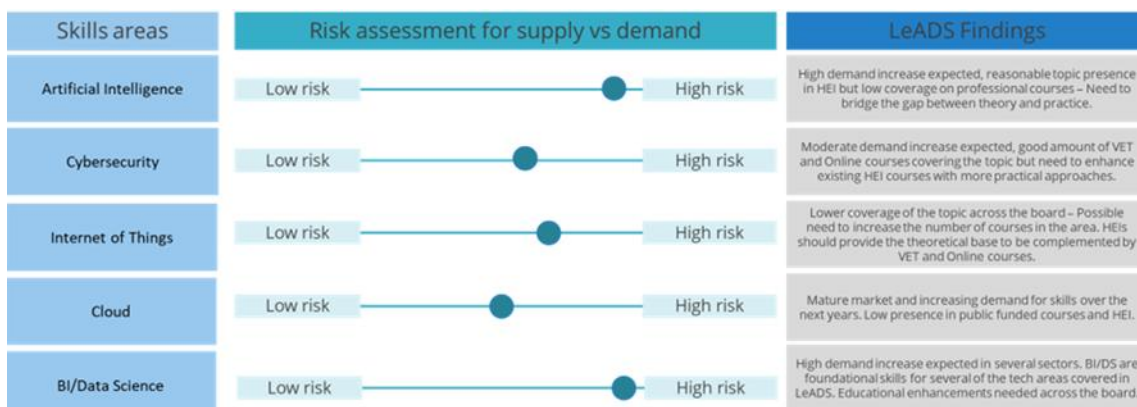
---

[6] https://advancedskills.eu/

Figure 9 Gap analysis that illustrates risks for the EU in some technology areas, including Data and AI (source: LEADS Gap Analysis)

The most **relevant insights about data and business intelligence** are summarised here for consideration in the data space context.

- **AI-enhanced data analysis skills are expected to pose the highest growth in demand** for the so-called Advanced Digital Skills (ADS). They will be one of the key expertise areas to support the overall development of AI in Europe.
- Concerning data management skills, **demand for data collection and data quality is expected to double**. This is explained by the fact that companies will need to adapt data source requirements beyond tools currently in place to make way for bigger data flows generated from AI and IoT interconnected systems.
- Other ADS skills, such as data visualisation and image processing, may see comparatively slower growth vs data analysis due to the higher level of automation fuelling processes and services in these areas, mainly driven by AI application development skills.
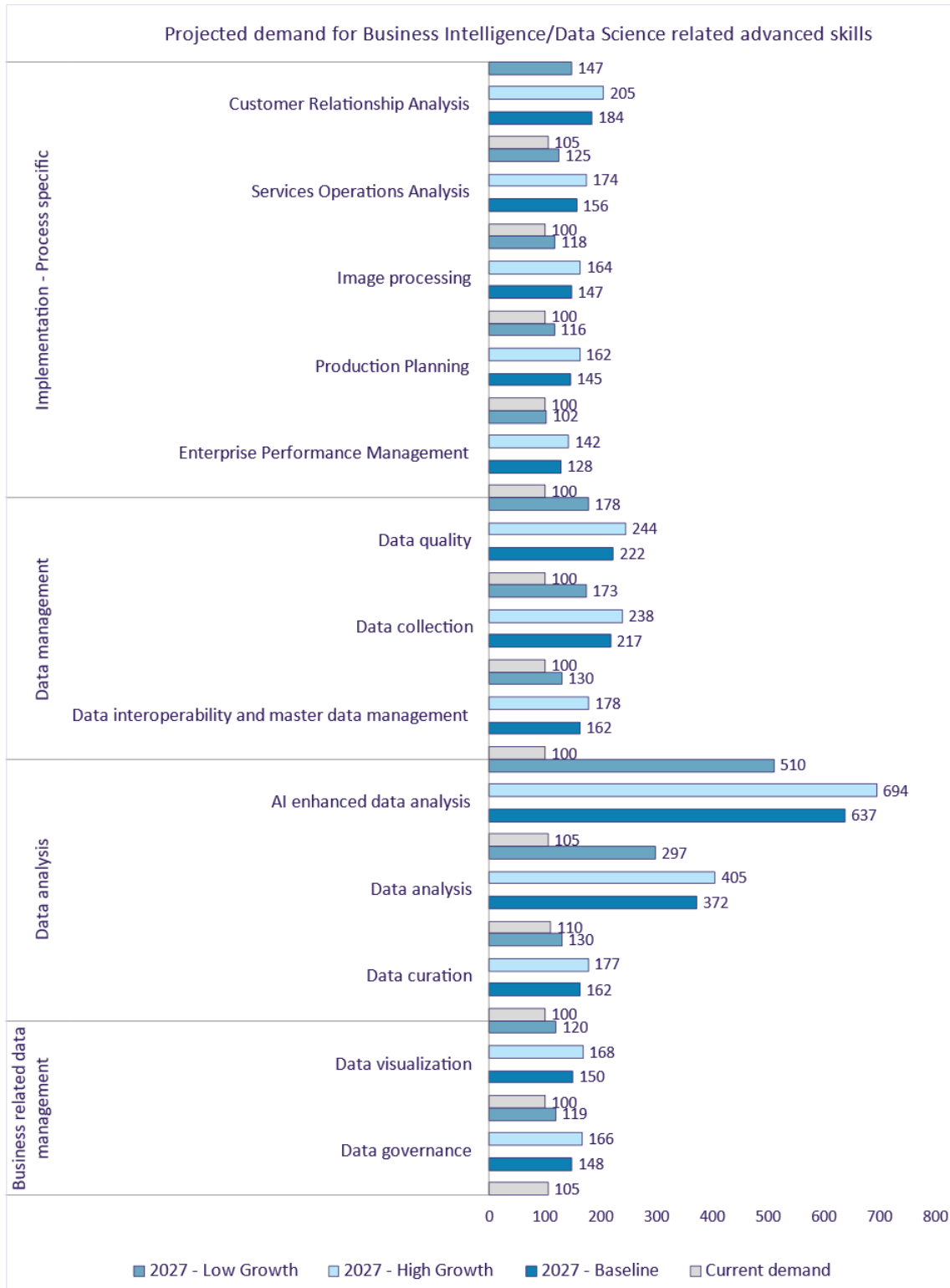
Projected demand for Business Intelligence/Data Science related advanced skills

Implementation - Process specific

- **Customer Relationship Analysis**
  - 147
  - 205
  - 184
  - 105
- **Services Operations Analysis**
  - 125
  - 174
  - 156
  - 100
- **Image processing**
  - 118
  - 164
  - 147
  - 100
- **Production Planning**
  - 116
  - 162
  - 145
  - 100
- **Enterprise Performance Management**
  - 102
  - 142
  - 128
  - 100

Data management

- **Data quality**
  - 178
  - 244
  - 222
  - 100
- **Data collection**
  - 173
  - 238
  - 217
  - 100
- **Data interoperability and master data management**
  - 130
  - 178
  - 162
  - 100

Data analysis

- **AI enhanced data analysis**
  - 510
  - 694
  - 637
  - 105
- **Data analysis**
  - 297
  - 405
  - 372
  - 110
- **Data curation**
  - 130
  - 177
  - 162
  - 100

Business related data management

- **Data visualization**
  - 120
  - 168
  - 150
  - 100
- **Data governance**
  - 119
  - 166
  - 148
  - 105

Legend: ■ 2027 - Low Growth ☐ 2027 - High Growth ■ 2027 - Baseline ☐ Current demand

Figure 10 ADS Digital Skills Survey, April 2023 (source: LEADS project)

The data-driven analytical exercise developed by LEADS clearly reinforces the **potential risk of not addressing data skills conveniently and will have a high impact on the adoption of data spaces and, particularly, the adoption of data spaces in tourism** (some details customised for the sector are available below).

3.5.2 Digital skills in the European tourism sector

The Tourism Transition Pathway,[7] published by DG GROW in February 2022, identifies 27 areas of measures for the green and digital transition and for improving the resilience of EU tourism. This document highlights the importance of two types of skills needed to achieve this twin transition: **green skills and digital skills**:

> "Skills for using and strategically integrating digital tools in work processes can facilitate developing and implementing more effective and better-quality services to meet the changing demand and expectations of the customers. Tourism actors need both basic and advanced digital skills. Tourism-specific digital skills approaches could be developed based on the European Digital Competence framework, which provides guidance on different elements to be included for different types of skills objectives. **Skills and job development for the twin transition play a key role in the long-term resilience of the tourism ecosystem**."

In 2017, over 20% of people employed in accommodation and other selected tourism industries had low educational qualifications. A Cedefop analysis of tourism job adverts shows that they range from elementary to high-skilled occupations. Job adverts highlighted the need for soft skills (teamwork, communication, adaptability), ICT skills and business-related skills (administration, accounting, budgeting, or marketing). To meet the challenges of the twin transition and to provide sustainable tourist services, all workers need to develop green and digital skills, as described earlier, in addition to or as part of their professional qualifications and competencies. To ensure tourism in the EU, and especially tourism SMEs, remain competitive and build their resilience, it is important that workers also develop strategic and innovation skills.

On the other hand, the European Tourism Dashboard[8] stands as a platform designed and maintained by the European Commission Joint Research Centre and DG GROW. Functioning as a web-based repository of expertise, this tool aggregates disseminates and presents insightful visual representations of pivotal tourism indicators. It has 18 indicators grouped under three pillars: environmental impacts, digitalisation, and social-economic impact. Under the digitalisation pillar, two indicators are useful to analyse the current situation regarding digital skills for tourist workers: the personnel training on digital skills and the enterprises seeking ICT specialists, depicted here.

---

[7] https://op.europa.eu/en/publication-detail/-/publication/404a8144-8892-11ec-8c40-01aa75ed71a1

[8] https://tourism-dashboard.ec.europa.eu/

Figure 11 Digitization pillar indicators (source: European Tourism Dashboard background and methodology[9])

Personnel training on digital skills (%)

This indicator expresses the share within the tourism ecosystem that provides ICT training to their workforce, shedding light on the extent of investment directed towards integrating and enhancing digital proficiencies. Elevated values within this indicator signify a greater prevalence of digital training initiatives. The data informing this metric is sourced from surveys administered by the National Statistical Institutes, targeting enterprises with a staffing complement of 10 or more employees, as well as self-employed individuals.
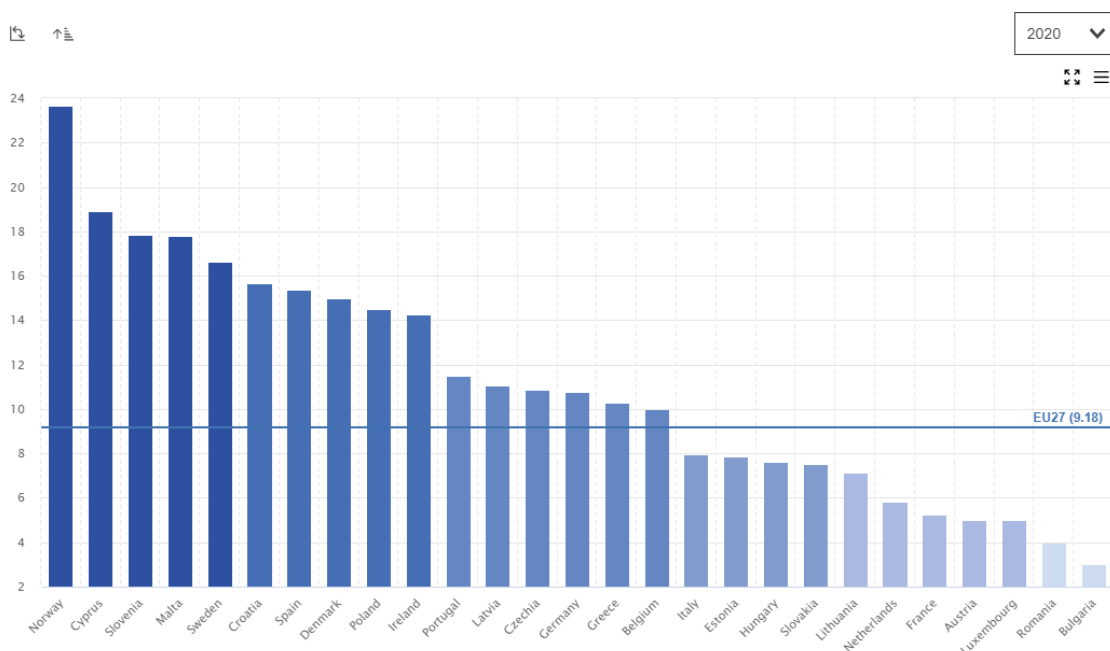

Figure 12 Personnel training on digital skills (%) (source: European Tourism Dashboard[10])

---

[9] https://tourism-dashboard.ec.europa.eu/background-methodology?lng=en

[10] https://tourism-dashboard.ec.europa.eu/map-view?lng=en&ctx=tourism&ts=TOURISM&is=TOURISM&tl=0&i=265&clc=digitalisation&db=728&it=ranking-chart&cwt=bar-chart&date=2020
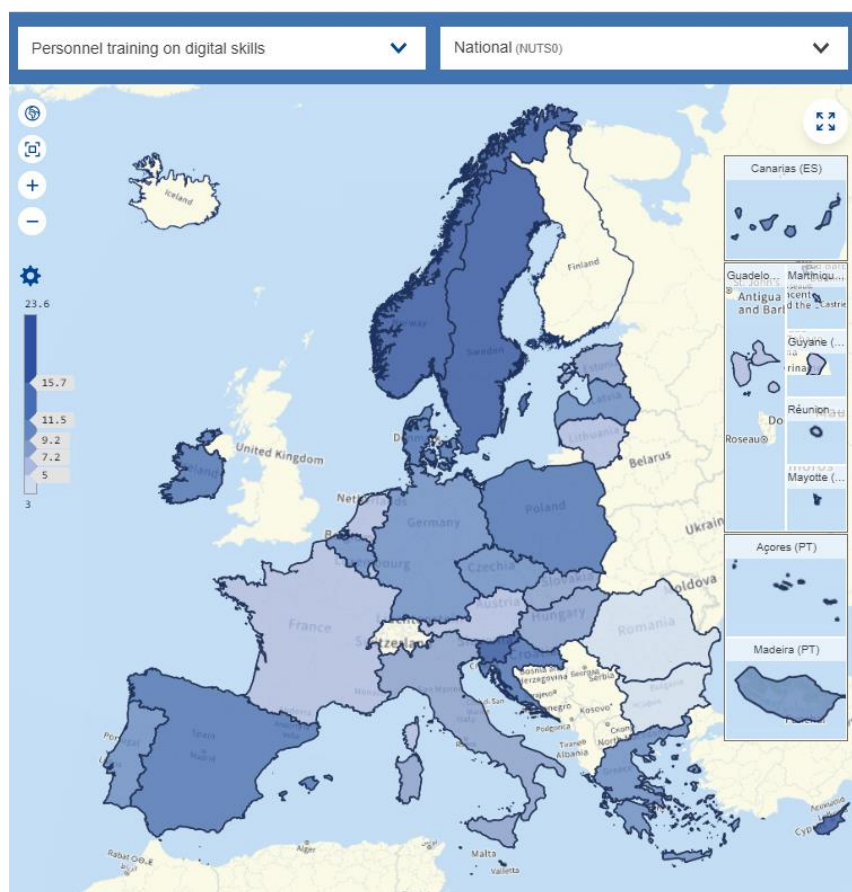
Figure 13 Map of Personnel training on digital skills (%) (source: European Tourism Dashboard[11])

This indicator shows **big differences between Member States**, with some countries reaching around 20% while some others shyly exceeding 2 or 3%. The most serious aspect is that the average is low, and looking at the market's needs, **even the figures of the countries' leading the ranking seem insufficient.**

Enterprises seeking ICT specialists (%)

This metric assesses the proportion of enterprises within the tourism ecosystem actively endeavouring to recruit ICT specialists, as derived from data obtained through surveys conducted by the National Statistical Institutes, specifically targeting enterprises within NACE sectors 55, 56, and 79, and inclusive of those with a workforce comprising ten or more employees, as well as self-employed individuals.

---

[11]https://tourism-dashboard.ec.europa.eu/map-view?lng=en&ctx=tourism&ts=TOURISM&is=TOURISM&tl=0&i=265&clc=digitalisation&db=728&it=ranking-chart&cwt=bar-chart&date=2020
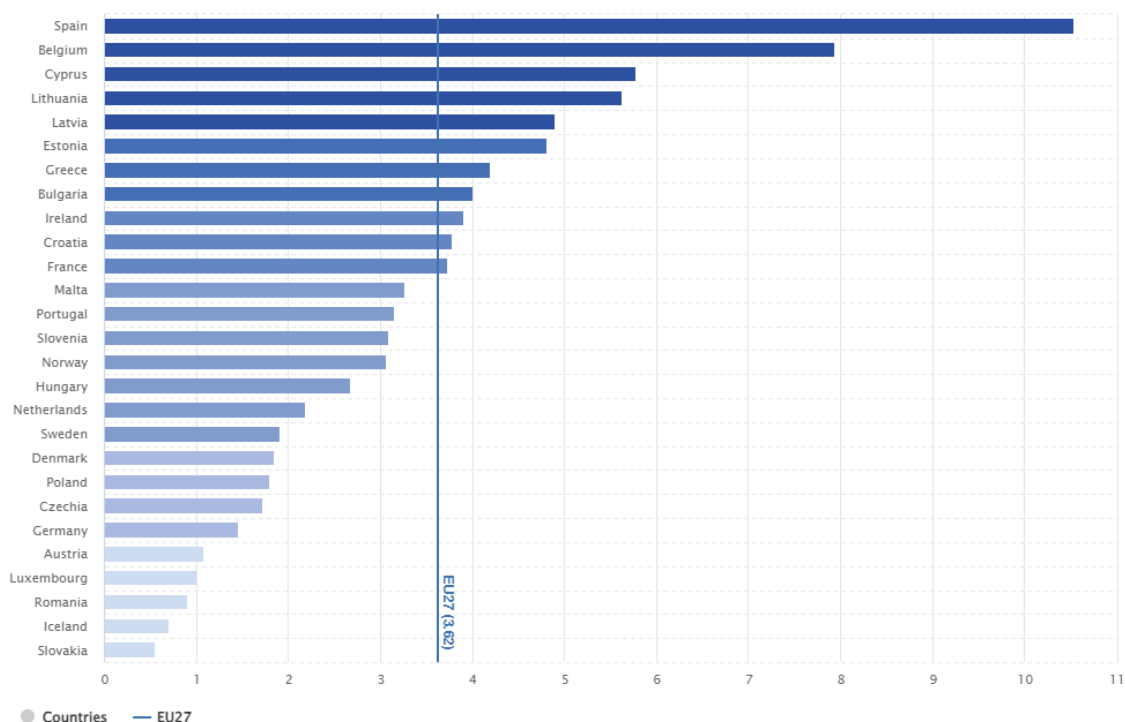
Figure 14 Enterprises seeking ICT specialists per country (source: European Tourism Dashboard[12])

This indicator shows the demand is high even though differences between countries exist, as in the previous indicator. If we consider data provided by the LEADS project on the gap between supply and projected demand, the situation turns out to be quite pessimistic. This probably worsens in the case of tourism because of the difficulty of the sector to attract IT specialists with respect to other industries like manufacturing, media (videogames) or energy.

3.5.3 Proposed Recommendations

As previously stated, the struggle to attract tech talent is affecting at a worldwide level and impacts all sectors. However, the tourism sector presents a special handicap: technological professionals such as mathematicians, engineers, architects, or programmers do not recognise the tourism sector as a clear alternative when developing their professional careers. This lack of recognition makes it even more difficult to attract talent in the European tourism sector and especially conditions the different initiatives to be developed. As a result, it is necessary to create an "employer branding strategy" in which the different stakeholders (public sector, private companies, and academia) work together to convince these technological professionals that the tourism sector presents great opportunities for professional development. Otherwise, the rest of the initiatives, which are intensive in time and resources, such as the design and run of education and training programs or the design of reskilling or upskilling strategies customised to the tourism needs, may fail since the

---

[12]https://tourism-dashboard.ec.europa.eu/map-view?lng=en&ctx=tourism&ts=TOURISM&is=TOURISM&tl=0&i=265&clc=digitalisation&db=728&it=ranking-chart&cwt=bar-chart&date=2020

professionals who participate in them will end up leaving the tourism sector and changing to other sectors that have traditionally been accepted as recipients of technological talent to develop their professional careers.

The public sector deserves special mention, which has traditionally had professionals accustomed to the creation, analysis, and publication of statistical and econometric data sources. Naturally, these are the professionals who are undergoing reskilling and upskilling actions to be able to deal with the new trends associated with data analysis. However, on the other hand, the public sector continues to suffer from a lack of flexibility. In this case, it is clearly manifested in its difficulty in hiring technological profiles. Even in those cases in which this analytical know-how necessary to interact with the future European Tourism Data Space is acquired through outsourcing processes (typically subcontracting), these processes are slow and time-consuming. This deprives the tourism sector of the agility that would be desirable so that it could position itself as an active agent and driver of the tourism sector. Having the necessary technological talent internally in the public sector is especially important due to the role that it has also played as "glue" with the private sector, made up mainly of SMEs that operate in its destination. This would allow the public sector to act as a driving force that would accelerate the adoption of the ETDS.

The EU Competence Centre[13] to support data management in tourism destinations will also play a key role in providing education, training, upskilling, and reskilling services to the European tourism sector. The project awarded in the call PPPA-2022-TOTOLAB is expected to kick off in 2024, and its objective is to set up and operate a (self-sustainable) competence centre (knowledge hub) that will support and expand the take-up of data-driven destination management to support tourism destinations across the EU. This Competence Centre will provide destinations with guidance and information related to data management and data-sharing competencies and strategies with a long-term perspective. This approach of working so closely and collaboratively with the destination technicians will provide, on the one hand, the ability to have a detailed diagnosis of training needs and, on the other hand, the ability to design and deploy them in a personalised way and with great capillarity in the European tourism sector. We recommend a close follow-up of this initiative and similar ones, running a critical impact assessment that paves the way towards a more sustained strategy in tourism for skills development.

---

[13] https://eismea.ec.europa.eu/funding-opportunities/calls-proposals/eu-competence-centre-support-data-management-tourism-destinations_en

4 COLLABORATION TO LEVERAGE FINANCIAL RESOURCES

We acknowledge that creating data spaces and especially ensuring adoption by many organisations in the tourism industry will take some time. This will also require investment of resources at personnel, organisational and financial levels, some of which will be scrutinised in the context of the deployment phase when scalability aspects come into play. On the other hand, there is a myriad of ecosystems and initiatives working on complementary aspects of the tourism data space. The focus should be on applying agile and pragmatic collaboration mechanisms, avoiding duplication of efforts, and capitalising on each other's work so that impact can be maximised through a well-thought-out deployment and adoption strategy. This section anticipates some of those initiatives or ecosystems that could be leveraged to speed up the process and manage resources more efficiently. It does not constitute a complete list, and there are probably other important efforts that do not appear here, but **the underlying message remains: collaboration is key**.

4.1 National ecosystems

Spain
As mentioned in D4.1, Spain is a decentralised country. For that reason, although there is a Ministry of Commerce, Industry and Tourism, the competencies of tourism are transferred at the regional level and, in some particular cases (like in the Balearic Islands, at the Island level). The Ministry, through Segittur (Sociedad Mercantil Estatal para la Gestión de la Innovación y las Tecnologías Turísticas, S.A.M.P, under the Ministry of Industry, Trade and Tourism), is leading the Smart Tourist Destination project, a pioneering international initiative aimed at implementing a **new model to improve competitiveness and the development of tourism based on governance and co-responsibility**. Segittur is also generating different initiatives related to data. One of them is **DATAESTUR, which provides information on Spain´s tourism industry**, a selection of the most significant Spanish tourism data for consultation and study, and a presentation of the main sources of information and results, constantly expanded and improved.

The Ministry is implementing a so-called "**country platform" to aggregate all data from all destination**s. All of them are aligned with the Smart Touristic Destination strategy and supported by the UNE 178 standard (where a specific semantic rule has been developed). Besides, in Spain, the data space competencies, including tourism, fall under another Ministry, namely, the Ministry of Economic Affairs and Digital Transformation. Assigned to it is the National Statistics Institute, a legally independent administrative autonomous institution. It has, among other functions, the relations on statistics with specialised International Institutions and, in particular, with the European Union Statistics Office (EUROSTAT). In 2022, the National hub of Gaia-X was created in Spain. AnySolution holds

the vice-presidency and leads the Tourism Working Group. From this group, proof of concepts and a lighthouse are being defined. Because of the impact on the country's GDP, the tourism ecosystem in Spain is very well-structured with a large number of companies, networks, clusters, associations and federations, starting with a solid structure at the national ministry level represented in the following figure:

Figure 15 Structure of the Secretary of State responsible for Tourism, Spain

Some of the related institutions that illustrate the complexity and size of the ecosystem are listed here for awareness:

- **Official tourism organisms:** AESA (Agencia Estatal de Seguridad Aérea), Direccion General de Aviación Civil, IET (Instituto de Estudios Turísticos), INE (Instituto Nacional de Estadística), OBSA (Observatorio de la Sostenibilidad de la Aviación), Eurocontrol, The European Organisation for the safety of Air, OMT, Organización Mundial del Turismo, WTTC, World Travel & Tourism Council
- **Public organisations of national cooperation in Tourism**: Sectorial Conference in Tourism, Spanish Council of Tourism, Interministerial Committee of Tourism
- **Federations and associations:** Exceltur (Alliance for Tourism Excellence), FEMP: Spanish Federation of Municipalities and Provinces, ICTE: INstitute for the Tourism Quality, CEOE: Spanish Confederation of Business Organisations, AMETIC: Digital Industry Association, which includes a committee on Smart Destinations, TURISTEC: a cluster of technologies applied to tourism, ITH: Technological Hotel Institute
- **Hotels, restaurants, travel agencies and others**: CEHAT: Spanish Confederation of Hotel and Rental Houses, AEDH: Spanish Association of Hotels Directors, ASETUR: Spanish Association of Rural Tourism, FEHR: Spanish Federation of hostelry and Restorations, CEAV: Spanish confederation of travel agencies, ANESTUR: National Federation of Tourism Schools

Italy

Italia Domani is changing Italy. Italia, through the National Recovery and Resilience Plan, includes important support measures to help relaunch this sector, including optimising **services through a digital hub, connecting the entire tourism industry**. This measure, involving an investment of EUR 114 million, aims to create a digital tourism hub that can be accessed via a dedicated web platform, allowing the entire tourism ecosystem to enhance, supplement and promote the services offered. This investment will be used to finance **digital infrastructure, artificial intelligence models for data analysis and basic digital services for tourism businesses**.

There are three action areas:
- optimising the Italia.it portal promoted by 'ENIT' (Italian National Tourism Board) by improving its user interface, adding more sources of information and expanding the range of services available to both tourists (e.g., healthcare assistance and information) and tourism operators (e.g., tour guides);
- adopting artificial intelligence models to analyse data on tourist flows in the areas of most and of least interest;
- developing an IT system to promote and manage tourism businesses, supporting its adoption and providing training for small and medium-sized operators in the country's most underdeveloped areas.

Germany

In Germany, the 16 federal state tourism organisations (LTOs) and the "Magic Cities" built a data lake of German destination data within a knowledge graph database. The so-called "Open Data Destination Germany"[14] project is intended to be a prerequisite for digital transformation in the direction of artificial intelligence to make Germany competitive as a tourism location. The project's core is the mentioned knowledge graph, which has been available online since June 2023. Access to the database is granted upon registration.

These initiatives are just a sample of the ongoing work on tourism that should be capitalised towards deploying the European Tourism Data Space. As mentioned in several of our reports, the Interministerial committee that has supported the execution of DATES includes a wide range of EU countries, many of them with relevant presence in our events and whose detailed strategies are not listed here to avoid a too extended document; a good example of this is the Austrian Data Intelligence Offensive initiative. Please refer to other documents published by the project, such as D4,1 or the landscape of data-sharing initiatives in WP2, for an extended view.

---

[14] https://open-data-germany.org/en/technology/

4.2 Complementarity of Instruments

Tourism Flagship under Technical Support Instrument (2022)

The Technical Support Instrument[15] (TSI) is the EU programme that provides tailor-made technical expertise to EU Member States to design and implement reforms. The support is demand-driven and does not require co-financing from Member States. It is an important pillar of the EU's initiative to help Member States mitigate the economic and social consequences of the outbreak of the COVID-19 crisis.

The TSI offers Member States a unique service to help them tackle reform challenges. The support can take the form of, for example, strategic and legal advice, studies, training, and expert visits on the ground. It can cover any phase in the reform process. This tool has a budget of €864 million for the 2021-2027 period.

Since 2022, every year, a list of topics linked to EU priorities is published so that Member States can submit projects aligned within those areas. In 2022, one of these topics was "Support to the tourism ecosystem: towards a more sustainable, resilient and digital tourism",[16] aimed to build a more sustainable, resilient and digital tourism ecosystem. The flagship sought to promote digital and green transitions, strengthen regional cohesion, and support the post-COVID-19 recovery of tourism in Europe to make it fit for future challenges in the global market. The expected impacts for this flagship were to boost better decision-making/making processes for the tourism ecosystem based on evidence and data, to help tourism statistics to include sustainability, and to establish efficient and sustainable tourism management and monitoring tools at the destination level.

In subsequent years, other priority areas of reform for the EU have been introduced, such as the digitalisation of regional or local administration, the fight against climate change or the improvement of capacities to respond to the migration challenge, among others. A complete list of the different themes grouped by year can be seen on the TSI web portal[17].

Since one of the main challenges of the EU is to promote the data economy, and for this, the **different European data spaces are required to be successfully adopted by both the public and private sectors, the TSI tool could be used to undertake this type of transformation**. In this way, different flagship projects could be launched in future years, responding to the main challenges that arise in the implementation and adoption of the future ETDS.

EU Competence Centre to support data management in tourism destinations (2024)

---

[15] https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes/technical-support-instrument/technical-support-instrument-tsi_en

[16] https://commission.europa.eu/system/files/2021-06/b3_tourism.pdf

[17] https://reform-support.ec.europa.eu/our-projects/flagship-technical-support-projects_en

In February 2023, a call for proposals was issued for the establishment and operation of the EU Competence Centre[18]. The primary objective of this centre, formerly introduced in the section devoted to skills, is to advocate for the **utilisation of data in decision-making for European tourist destination managers**. The initiative involves guiding destinations on efficient data management and utilising business intelligence for policy decisions. It also supports the implementation of data-driven management, enhances data-sharing capabilities in line with EU policies, and encourages collaboration with regional national statistical offices and Eurostat. Additionally, it promotes cross-border partnerships for knowledge exchange and best practices in data management.

This is a project with a budget of €3 million and an execution period of 3 years, at the end of which it will be legally established and will launch its operations. The start of this project (the design phase of the Competence Centre) will probably start around mid-November 2023 and will run during a period in parallel to the deployment phase of the Tourism Data Space. The EU Competence Centre is led by AnySolution, and other partners from DATES are involved, such as NECTSOUR, Italian Ministry of Tourism and ARCTUR. While some collaboration should be established at the beginning of both projects, **we expect a tight relationship to be forged when both the ETDS and the EU Competence Centre are fully operational** (theoretically by the end of 2026). This way, the EU Competence Centre could help European destinations and the SMEs that operate in them use data in their decision-making and thus facilitate the adoption and use of the ETDS. The capacity building, knowledge transfer activities and other services that the EU Competence Centre provides could be instrumental to this purpose.

European Digital Infrastructure Consortium (EDIC)

EDIC is an instrument made available to Member States under the Digital Decade Policy Programme 2030 to speed up and simplify the setup and implementation of multi-country projects, thus facilitating the achievement of the Digital Decade general objectives and targets. EDIC can generally be used to deploy joint infrastructure, deliver services and bring together – as considered appropriate by the founding Member States – public entities, private entities, final users and industry. As such, it can be used both for establishing new infrastructures and for operating already existing ones if the change of status brings added value to the activities already in place, e.g., sustainability over time. This fits very well with the deployment of data spaces, and EDIC is seen as a key mechanism to bring the ETDS to a level of scalability and operationalisation that is attractive enough to engage a great part of organisations working in the tourism sector. The fact that the deployment phase of the data space received 50% funding may be a barrier for many stakeholders to step in at an early stage. **Having an EDIC to support the co-financing aspect could be key to accelerating the deployment and adoption**. While some discussions already exist among

---

[18]   https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/pppa-2022-totolab-01

some MS, the election process in some countries (and the dependency on investments committed by the nations until new governments are in place) creates uncertainties.

The Communication of the EC "Towards a Common European Tourism Data Space: Boosting Data Sharing and Innovation across the tourism ecosystem" points out additional initiatives and programs of relevance to the ETDS, such as the stakeholder platform to be launched in 2024, a test action, ongoing works of JRC and course the DEP project on the Deployment of the Common European Tourism Data Space established as a reference for the data space. Some initiatives are showcased in the following table for better understanding and comparison.

While all initiatives mentioned here have mainly public financial support, additional private funding sources should be sought. In any case, as previously justified, tourism shows a clear need for engagement of the public sector and the requirement to support an SME-based industrial network. Insights on revenue sources and business opportunities looking at the sustainability of the ETDS have been explored in D4.4.

Name	Managing entity	Description	ETDS complementarity	Execution status
EDIC	Consortium of EU Member States (at least three)	An EDIC is a legal entity that drives EU Multi-Country Projects (MCP). The objectives of such MCP can be freely agreed on between the participating members. Funding should be provided predominantly by the MS, but an EDIC can apply to public funding programs.[19]	As a container for MCPs, an EDIC might be suitable to drive overarching activities that are out of the scope of a single data space.	In the planning phase.
Tourism Flagship (TSI)	DG REFORM	The Technical Support Instrument (TSI) is the EU programme that provides tailor-made technical expertise to EU Member States to design and implement reforms. The support is demand-driven and does not require co-financing from Member States. It is an important pillar of the EU's initiative to help Member States mitigate the economic and social consequences of the outbreak of the COVID-19 crisis.	The TSI provides technical support to Member States in a wide range of policy areas. The areas complementary to the ETDS include Green transition (including climate action, circular economy and energy transition), Digital transition, Skills, education and training, Governance and public administration.	An EU Member State wishing to receive technical support submits a request to the Commission via a national Coordinating Authority. This request must be submitted by 31 October of each year (period 2021-2027)
EU Competence Centre to support data management in tourism	European Innovation Council and SMEs Executive Agency	The Competence Centre will support and expand the take-up of data-driven destination management to support tourism destinations across the EU.	Provide destinations with guidance and information related to data management, as well as business intelligence on how to source and use data and apply data-intensive knowledge to address policy	The call PPPA-2022-TOTOLAB to implement the Competence Center was closed on 26 April 2023,

---

[19] See https://digital-strategy.ec.europa.eu/en/policies/edic#:~:text=European%20Digital%20Infrastructure%20Consortium%20is,Decade%20general%20objectives%20and%20targets.

destinations	(EISMEA)		actions and strategies. Support destinations in developing and implementing data-driven management and data-sharing competencies and strategies with a long-term perspective, in line with the policy priorities at the EU level and the work carried out by regional and national statistical offices, also in cooperation with Eurostat. Establish cross-border/transnational cooperation between relevant organisations and actors in the destination ecosystem to support the creation and transfer of knowledge and best practices in data management and sharing	and the granted proposal is expected to start activities in November 2023. The Competence Center must be set up by, at the latest, by project completion in 2026
DEP project on the Deployment of the Common European Tourism Data Space	European Health and Digital Executive Agency (HaDEA)	The project is expected to deliver the infrastructure for the Tourism Data Space, connections between relevant local and national data ecosystems and initiatives at the EU level, connections with other sectoral data spaces, guidance/training documents to involve stakeholders in sharing data, Exploitation of available data for better interconnection, exchange of information and reuse as well as regular updates on usage data and troubleshooting once the data space is operational.	This project is the obvious continuation of the two CSAs that have been working for one year on the design of the ETDS and whose joint blueprint has just been released. DATES has made a huge effort in linking and analysing data-sharing ecosystems, providing insights on valuable use cases proposing a governance model and a series of business opportunities and models for the different stakeholders and roles involved in the data space. The new project should build on these findings and assets.	The call has been launched on 28 September 2023, and the deadline for submission is 23 January 2024. The project execution is 36 months.

Table 1 Showcase of some of the initiatives for better understanding and comparison

5 CONCLUSIONS & SUMMARY OF RECOMMENDATIONS FOR THE DEPLOYMENT OF THE TOURISM DATA SPACE

In the last chapter of this document and aiming at ensuring that some of the main messages remain in readers' minds, we have decided to dedicate this part of D4.4 to a set of recommendations that would help deploy the ETDS. Some of the recommendations are brought from previous chapters of the report. In contrast, others are formulated as such for the first time but still derived from reflections and analysis provided by the document. The list is not exhaustive, and this work should be continued as data spaces evolve and get more mature.

Major recommendations for Governance & business

R1. Membership of the ETDS. The following actors should be considered when designing the involvement of stakeholders in the governance structure: European Commission, Eurostat and representatives of national statistics offices, Sectoral research institutions, Sectoral non-governmental organisations, Representatives of destinations, Representatives of the tourism industry (Large businesses, SMEs, Micro-enterprises), Representatives of local, regional or national data spaces. It should be representative of the entire value chain and diverse enough to consider a wide range of needs and requirements.

R2. Operational governance for the ETDS. Key elements of the governance model should start with at least:

i)   The purpose/mission statement for the ETDS and
ii)   Decision-making, transparency principles and mechanisms/procedures to address ethical questions when they arise. An external Ethics committee would be desirable or at least a possible option to avoid any conflict of interest.

R3. Operational governance for the ETDS. The governance of the data space should include **assessment mechanisms**, including indicators that are periodically measured, transparently communicated to the members and regularly audited. This should measure the performance of the data space (improve and take corrective actions if needed) and as a marketing tool to communicate its value to the members. KPIs that require data collection from the participants could be part of the assessment framework.

R4. Legal Entity acting as data space governing body. The governing body is the entity responsible for creating, developing, maintaining, and enforcing a governance framework. While depending on the nature of the data space, different entities could be considered as governing bodies. Our preference is to select a legal entity. According to the consulted

entities in the tourism sector, the best choices would be public entities or not-for-profit organisations so that neutrality and support for disadvantaged players (as would be the case of many SMEs) can be guaranteed.

R5. Business models. A variety of business models should be allowed by the data space, creating an umbrella of opportunities for data providers, data consumers and intermediaries. A chapter exploring the value proposition for different roles and business models with examples can be found in D4.4.

R6. Sustainability of the data space. Besides the business models that the participants of the data space could deploy, the governing body, as a kind of extended intermediary, should consider a sound business model to guarantee the sustainability of the operations. For this, a conscientious analysis of costs and revenue incomes should be undertaken. Depending on the nature of the data space, some business models may prove more successful than others. D4.4 explores several possibilities that have been checked with tourism stakeholders and go from the payment of membership fees to payments associated with the transactions facilitated by the data space in absolute numbers or as a % of the benefit attained through such transactions. These are just examples of inspiration.

R7. Implementation of roles in the governance of the data space. DATES suggests the use of the so-called Rolebook. The Rolebook is an open, transparent, and dynamic registry of roles and bodies involved in data sharing. Role refers to the set activities that the one performing the role is expected to do. Rights and duties (obligations) can be associated with the role. The Rolebook aims to increase clarity and enable stakeholders at all levels (EU, Member States, data spaces) to easily map the current data governance structures and their respective scope.

R8. Implementation of rules in the governance of the data space. DATES suggests the use of the so-called Rulebook. The Rulebook encompasses:

i) Hard law: EU and Member State legislation that directly or indirectly relates to data or data sharing,

ii) Soft law: standards, codes of conduct, guidelines, etc., that are not legally binding. Soft law rules cover a wide range of issues, including technical, business, ethical and security, and

iii) Internal rules: rules developed specifically between participants in a data space, such as business agreements/regulations and context-specific data standards and policies. The Rulebook facilitates a compliance framework since it should have relevant regulations (hard law) and help the data space participants to agree on common standards and guidelines for implementation (soft law) that help them to decide on internal rules.

* Compliance with the ETDS Rulebook creates trust in data sharing among data space participants. Combining a rolebook and a rulebook can be a good basis for defining the governance of a data space and promoting property inheritance and interoperability.

R9. Opportunity behind an EU-level Tourism Coordinating body. DATES introduces the idea of creating a specific entity for the governing role of the data space, an EU-level Tourism Coordinating body that oversees, coordinates and aligns activities in data-sharing in the tourism sector, considering the different levels of granularity of tourism data spaces (that could be focused on geographical coverage levels) and the complexity of managing coordination and interoperability with other sectorial data spaces.

R10. Technical framework to facilitate technical deployment of the governance. DATES suggest the use of the Gaia-X data space governance authority and governance framework to implement some of the functions associated with the governance of a data space, such as the onboarding process, due to its maturity in the ecosystem.

R11. Compliance framework. As part of R10, the 'Trust framework' and "Policy Rules & Label document" could be used to implement the compliance part of the governance of the data space.

R12. Implementation of the onboarding process. As part of R10, the Gaia-X Digital Clearing House (GXDCH) could help to operationalise the onboarding of members in the data space. It works as a federated/distributed system and involves a Participant and Trust Anchor Registry, a compliance service and a notarisation service.

Major recommendations to develop a service ecosystem around the data space

R1. Access to data does not seem sufficient for potential users of the ETDS. Due to the nature of many of the participants (99% of players in tourism are SMEs that may not have neither the resources nor the skills needed to benefit from the data spaces), access to a catalogue of services is a prerequisite. The offering of such services should consider the financial capacity of its users and, therefore, fit with the market conditions. Examples of services could revolve around i) Easy onboarding (process, guidance, tools, Connector aaS), ii) Assistance for data exploitation, iii) Community (standardisation, use case "fair", common app evolution). A full range of opportunities is expected to emerge around data analytic services and the ones mentioned before, enhancing the role of data intermediaries in the data spaces (compliance with DGA required).

Major recommendations for stakeholder engagement

R1. The baseline created by the data space community should be capitalised. Therefore, future deployment efforts should build upon existing communities of practice and develop them as required by the data space. This requires a full account of the mechanisms, initiatives and ecosystems created so far.

R2. The **engagement strategy** should focus in the initial stages of the deployment on **attracting a sample of committed frontrunners in the tourism sector that fulfil the different roles of the data space.** This should contribute to establishing a **piloting phase** that illustrates the practical aspects of **implementing some of the most appealing and valuable use cases**. This would be the "active" part of the community.

R3. The engagement strategy should create **awareness and "accompany" a bigger community,** aiming to prepare a subsequent phase for engaging members in the data space. This part of the community would be in "waiting" mode until the operationalisation of the onboarding process is completed.

R4. The engagement strategy should consider creating a variety of **user stories and modular value propositions depending on profiles.**

R5. The data space should consider the application of **community management techniques to retain users and manage the expectations** of organisations already engaged in the data space, focusing on maximising the value perceived and achieved by each member.

Major recommendations for skills development and capacity building

R1. Skills development. Develop an "employer branding strategy" in which the different stakeholders (public sector, private companies, and academia) work together to convince IT professionals that the tourism sector presents great opportunities for professional development. This would be a way to "fight" against the scarcity of resources that becomes even more pronounced in the case of the tourism industry, where IT-skilled people do not see the feasibility of developing a "serious" professional career.

R2. Skills development. Recognise the relevance and driving role of the public sector in tourism and introduce flexible mechanisms for the acquisition, retention, and development of talent. The public sector is especially important due to the role that it plays as "glue" with the private sector, made up mainly of SMEs that operate in destinations. As such, the public sector should and could act as a driving force to accelerate the adoption of the ETDS. Unfortunately, it continues to suffer from a lack of flexibility that is clearly manifested in its difficulty in hiring technological profiles. Flexible mechanisms should be put in place to revert this trend.

R3. Skills development. Capitalise operations of the EU Competence Centre. The EU Competence Centre will support data management in tourism destinations and will play a key role in providing education, training, upskilling, and reskilling services to the European tourism sector. While it will be launched in 2024, collaboration should be designed so that its ability to provide destinations with guidance and information related to data management, as well as data-sharing competencies and strategies with a long-term perspective, is maximised.

R4. Reaching a level playing field. The diversity of organisations in the tourism industry is as high as their degrees of readiness to benefit from the data-sharing economy. Different instruments must be considered to reach a level playing field. For example, *data vouchers* could be designed to support SMEs (e.g. the Korea Data Agency uses such voucher schema to help SMEs in their data transformation path in the manufacturing industry).

Other recommendations

R1. Collaboration with existing and future initiatives is key to leveraging financial resources. As shown in the previous example of the EU Competence Center, deployment projects should develop smart strategies to take advantage of the operations, resources, community, and knowledge generated by others instead of putting all the work under the same machine. In the case of tourism, a wide umbrella of initiatives and programs is or will soon be in place, including the Tourism Flagship under technical support Instrument, test actions and the aforementioned competence centre, plus a myriad of efforts undertaken in national ecosystems.

R2. Interoperability with other data spaces within and across sectors is of utmost relevance for the development of the data economy and a critical part of the value proposition of data spaces. When stakeholders of the tourism industry were confronted with different elements of a potential value proposition of the ETDS, they always pointed out the ability to access data sets from other data spaces as a key factor for their potential engagement. However, for this to work, collaboration should happen at different levels. DSSC could still be instrumental in guiding the work on such interoperability levels. Agrifood, green deal, mobility and automotive, energy and many others seem very well suited to create value in the tourism sector. Notice that, for example, the so-called Data Space for Smart and Sustainable Cities and Communities builds upon a mature community of cities that have implemented or support a mechanism known as MIMs (Minimum Interoperability Mechanisms); accounting for such technical developments could be very important to accelerate the cooperation between data spaces.

R3. Reusability and evolution of existing components (OSS) should be promoted. The DSSC features several Building blocks classified by categories that should be well analysed and tested before developing new ones. Some building blocks are still at the level of specifications, while others enjoy open reference implementations. Data spaces in their deployment phase will play a key role in assessing the SW quality and validity of the building blocks proposed by different catalogues.

R3. Additional work should be put on valuation mechanisms. Assigning a price to a data set still seems rocket science for most organisations. The number of factors that can influence the value of data is high, and some of these factors are difficult to incorporate into a valuation system systematically. For example, the value of datasets can be strongly influenced by how it's used or by sudden global events or developments, which means that a dataset can fluctuate strongly in value from one day to the next. For business models, this ultimately means that two companies can have a very similar business model but be very different in their success due to the valuation of the data. Tools that support data providers (and also data consumers) in such challenges would make a great contribution.

R4. Collaboration between different organisations could help to extract value out of data that is not being utilised. Governments, industry, and other public stakeholders can investigate new ways of collaboration to unlock data and provide services in the public

interest. Examples of such developments are **data trusts**. The Open Data Institute defines data trusts as new structures in which data owners give control over their data to a group of trustees that looks after the interests of the data owners as well as users – helping users provide benefits to society. Options like these can be further investigated to understand how they would apply to tourism.

While the project ends here, this work is to be continued. We hope that so far, it was a useful journey for the reader.