



Work Package 2: Context Analysis and Agreed Components

Towards a Data Space for Tourism – Prioritization of data needs and data purposes

Post - workshop report

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1. Workshop Overview

DATES Project Objectives

The workshop “Towards a Data Space for Tourism – Prioritization of data needs and data purposes” took place in the context of the project **DATES – Data Space for Tourism**, financed by the **Digital Europe Programme (DIGITAL)**. The objective of DATES is to develop a strategy roadmap for building a tourism data space, in collaboration with stakeholders of the tourism sector.

*A **data space** is defined as a decentralised and standard-based structure to enable trustworthy data sharing between the data space participants on a voluntary basis, regulated through governance, business, legal and technical combined mechanisms.*

Therefore, a data space is a particular type of data sharing initiative, characterized by a **higher level of data control** by participants. Indeed, in data spaces, data are not centrally stored and exchanges (for free or against compensation) are based on agreements. A second key aspect of data spaces is **trust among participants**, which is not only guaranteed by technological requirements, but also by the data space governance.

As a transversal industry, tourism has a great need for efficient data exchange within and across industries. A data space indeed represents an opportunity for the sector: it allows to capture value associated with data production within the industry and, at the same time, its possible interoperability with other sectors data spaces (e.g. mobility and cultural heritage data spaces) allows to also access other industries' data. Such enhanced availability of data could foster industry innovation, the digital transformation of tourism SMEs, and provide a basis for policy making.

To turn the vision of a European Tourism Data Space into reality, the overall work plan of DATES unfolds over a time span of 12 months. In this period, the project team will organize several consultation activities, if you are interested in participating please sign up at the link below.

Do you want to contribute to the European Data Space for Tourism?

Become a stakeholder, signing [here!](#)

Aim of the workshop

The workshop “Towards a Data Space for Tourism – Prioritization of data needs and data purposes” took place online on the 8th of February from 10:00 AM to 12:15PM CEST. The workshop agenda is presented in the following table.

Table 1: Workshop agenda

Time	Session	Contributor
Section I – A European data space for the tourism sector		
10:00 – 10:05	Welcome	Giovanna Galasso – Associate Partner – Intellera Consulting
10:05 – 10:15	Objectives of DATES and the benefits for the tourism sector	Dolores Ordóñez – Director - Anysolution
10:15 – 10:45	The concept of data spaces	Árpád Welker – Policy Officer – European Commission & Jean-François Cases – President – EONA X
10:45 – 10:55	First results concerning data sharing initiatives	Marco Codastefano – Manager – Intellera Consulting
10:55 – 11:00	Introduction to the breakout rooms	Daniilo Bianchini – Manager – Intellera Consulting
Break (11:00-11:10)		
Section II – Connecting the dots		
11:10 – 12:00	Data needs prioritization workshop	Break out room's moderators
12:00 – 12:15	Discussion and closing remarks	Break out room's moderators

As depicted in the agenda, the workshop was divided into two main sections.

The objective of the **first section** of the workshop was to raise awareness on the concept of data spaces and DATES project. Starting off, the audience was debriefed with the project’s objectives and its benefits for the tourism sector. The policy context of the project and the key characteristics of a data space were accordingly showcased, followed by a practical example of a mobility, tourism, and transport data space (EONA-X). Thereafter, the initial findings of the project were presented, and the break-out rooms’ setup (second section) were subsequently introduced.

The objective of the **second section** of the workshop was to prioritize a series of business challenges that stakeholders face in their day-to-day activities, and that could be potentially solved by the use of a sector data space¹. At the same time, this activity allowed to define the stakeholders’ data needs, as they were asked to associate different types of data with each challenge. In order to do so, participants were split into four breakout rooms, one for each of the identified data purposes, i.e. the main reasons why tourism stakeholders might be interested in accessing data. The breakout rooms were:

- Breakout room I: Increase of tourism sustainability & accessibility;
- Breakout room II: Conduct market analysis & inform decision-making;
- Breakout room III: Improvement of the interaction and engagement of the tourist;
- Breakout room IV: Improvement of planning and operations of tourism services.

¹ The main sources used to identify the challenges are: European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Galasso, G., Montino, C., Sidoti, A., et al., *Study on mastering data for tourism by EU destinations : main text*, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2873/23880>; and European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, *Transition pathway for tourism*, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2873/344425>

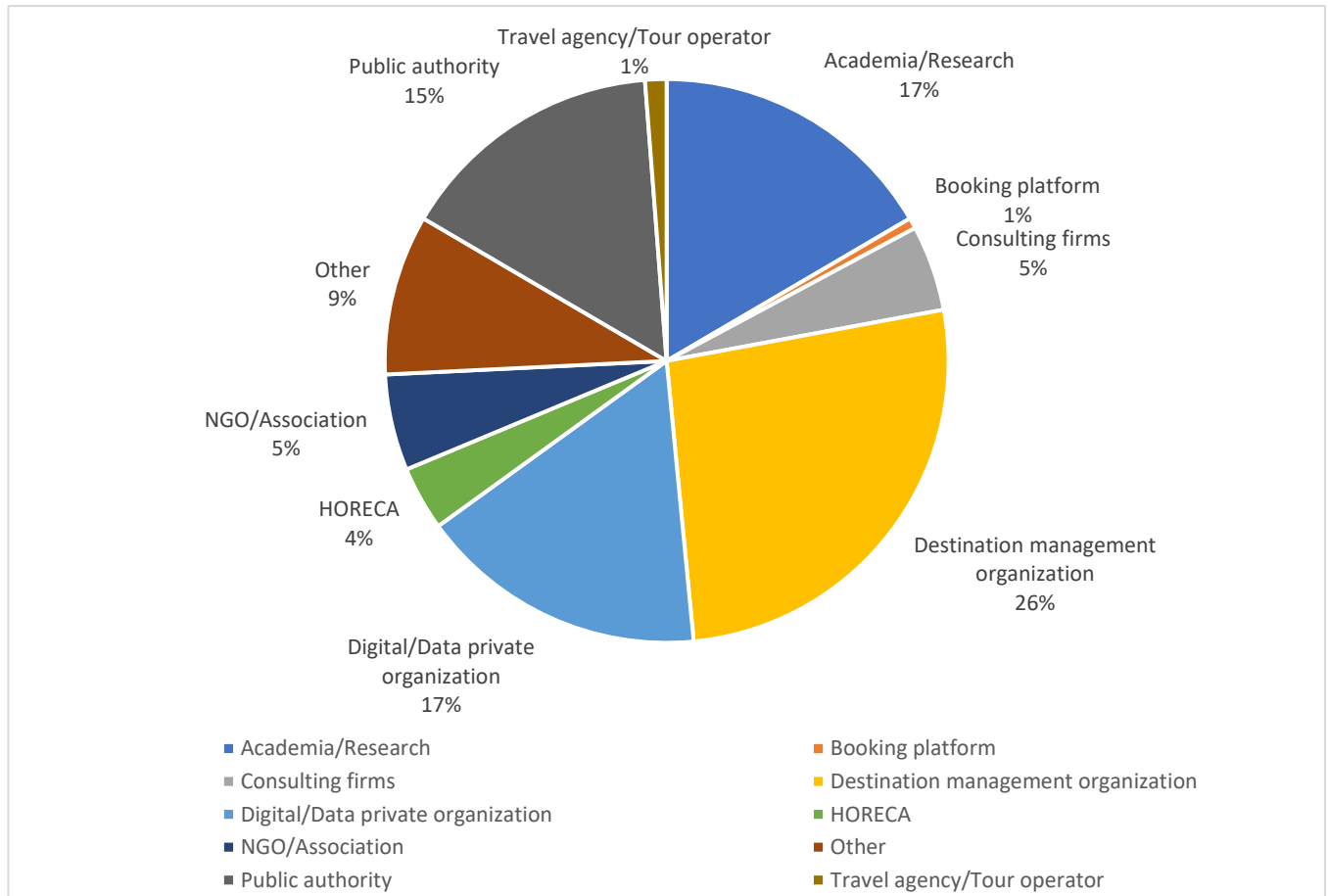
The results of such workshop will be used as the **starting point of the development of use cases**, which will help the team in defining the characteristics that a European data space for tourism should have. Moreover, workshop results will complement the analysis of the gaps and overlaps among the existing data sharing initiatives focused on the tourism sector.

The slides of workshop Section I are presented in Section 5 of this report, while the results of the breakout rooms are presented in Section 3.

2. Attendance

Overall, **207 participants** from **27 countries**² attended the event. The attendees covered several categories of stakeholders, ranging from destination management organizations to consulting firms and public authorities. Accordingly, the graph below provides an overview of the workshop participants distribution by typology of stakeholders.

Figure 1 - Participant distribution



3. Key findings

The following subsections depict the findings that were uncovered in each breakout room. The activities in each breakout room followed the same structure:

- For each presented challenge, participants were asked to rate its importance (on a scale from 1 to 5, where 1 was *absolutely not important* and 5 *very important*) and to mention which types of data they would need to address it;

² Albania, Argentina, Austria, Belgium, Bosnia and Herzegovina, Croatia, Czech Republic, Finland, France, Germany, Greece, Netherlands, Hungary, Ireland, Israel, Italy, Mexico, Norway, Poland, Portugal, Slovenia, Spain, Switzerland, Turkey, United Kingdom, United States of America.

- Then, they were asked to rank the priority of the challenges (by positioning the one with the highest priority at the top of the list and the one with the lowest priority at the bottom);
- Finally, they were asked an open question to investigate whether there was any missing challenge, its rate and the data needed to address it.

Correspondingly, Table 2 depicts the types of data presented when asked which data are the most useful to solve the specific challenge.

Table 2: Typologies of data needed to address a specific challenge

Type of data	Explanation
Accessibility data	Data about accessibility and inclusivity of the destination
Behavior of tourists	Data about the context of consumer behavior in the purchase, uptake and abandonment of tourist services.
Demand and offer data	Data concern occupancy rates and/or number of overnight stays on daily basis, level of quality of tourism for region, prices for tour operators' contracts.
Local/Residents' satisfactions and emotions	Data about emotional aspects of local communities.
Mobility	Data about transportation sector, including maritime, air and train flow data, ticketing and payment services.
Purchase habits	Data about tourism consumption behaviors (e.g. tourist expenditure by nationality, transaction data, consumption decisions both online and offline).
Related industry data	Data about all the related industry to tourism sector, like agriculture, amusement parks, real estate data.
Sustainability data	Data on the economic, social and environmental contributions and dependencies of tourism (e.g. loading capacity requirements for geographic destinations, use of natural resources by tourism, tourism water consumption).
Typology of tourists	Data about profiling of tourists, including demographic characteristics, tourists' personal data.
Tourists flow	Data about tourists' movement on a specific site.
Tourists' satisfaction & emotions	Data about customer experience, emotional aspects of tourists, review scores, sentiment analysis.

Accordingly, the findings of each breakout room will be shown in the following paragraphs.

Guide for results interpretation

For each challenge, a table depicts three key findings: i) the average importance rating that participants gave to the challenge, implying the impact on the business to which they belonged; ii) the percentage representing the frequency of votes expressed for each rating number (from 1 to 5); and iii) the percentage representing the frequency of votes expressed for each data type, when asked which are the most useful ones to solve the challenge³.

Break out room 1: Increase of tourism sustainability & accessibility

Moderators: Tatiana Semenova and Adele Pia Villani from the Italian Ministry of Tourism

The first breakout room was dedicated to the data purpose of sustainability and accessibility, or else the improvement of sustainability and accessibility of the tourism offer producing positive impacts on society at large. For this specific data purpose, the project team uncovered 7 challenges: the respective findings of each of them are illustrated below.

Challenge I: Support the growth of sustainable parameters awareness among the tourism industry

The challenge of supporting the growth of sustainable parameters awareness among the tourism industry relates to the fact that the tourism industry is pervaded by a lack of awareness of sustainable parameters. There is a need to provide much more valuable information to users of touristic services. This implies more measurable impact indicators and monitoring systems made available for both tourists and stakeholders. Also, in this case, digital technologies can play a relevant role for both gathering data and producing valuable impact score carding systems.

As shown in the table, an average **rating of 4.3** out of 5 was given to the challenge of *supporting the growth of sustainable parameters awareness among the tourism industry*. Correspondingly, *behavior of tourists, sustainability data and mobility data* were considered to be the three types of data that are most useful to solve this challenge.

³ As this was investigated through a multiple-choice question, the percentages are calculated as the total number of votes received by each data type divided by the total number of votes expressed.

The percentages of the results were rounded to the nearest whole number. As a result, the sum of the individual numbers does not always add up to 100%.

Table 3 – Increase of tourism sustainability & accessibility challenge 1 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.3</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">★ 0 %</div> <div style="text-align: center;">★ 0 %</div> <div style="text-align: center;">★ 7 %</div> <div style="text-align: center;">★ 57 %</div> <div style="text-align: center;">★ 36 %</div> </div> <p style="text-align: center;">14 voters</p>	Behavior of tourists	16%
	Sustainability data	13%
	Mobility data	13%
	Tourists flow	12%
	Accessibility data	8%
	Demand and offer data	8%
	Local/Residents' satisfactions and emotions	8%
	Tourists' satisfaction & emotions	6%
	Purchase habits	6%
	Related industry data	5%
	Typology of tourists	5%
15 voters	15 voters	100%

Challenge II: Manage tourism seasonality

The challenge of managing tourism seasonality has to do with the importance of being able to identify, address and mitigate the effects of the seasonal variation of waste, pollution and natural resources consumption generated by tourism. At the same time, crowds might also be detrimental for fragile landscapes and heritage sites. Similarly, following Covid-19 pandemic, visitors are increasingly inclined to choose destinations with lower density and able to offer safe and diversified outdoors activities.

As shown in the table, an **average rating of 4.5** out of 5 was given to this challenge. Correspondingly, **tourist flow, behavior of tourists and mobility data** were considered the most useful data to solve this challenge.

Table 4–Increase of tourism sustainability & accessibility challenge 2 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.5</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">★ 0 %</div> <div style="text-align: center;">★ 8 %</div> <div style="text-align: center;">★ 0 %</div> <div style="text-align: center;">★ 25 %</div> <div style="text-align: center;">★ 67 %</div> </div> <p style="text-align: center;">12 voters</p>	Tourists flow	17%
	Behavior of tourists	14%
	Mobility data	14%
	Sustainability data	12%
	Typology of tourists	12%
	Demand and offer data	9%
	Local/Residents' satisfactions and emotions	9%
	Accessibility data	5%
	Purchase habits	5%
	Tourists' satisfaction & emotions	3%
	Related industry data	2%
13 voters	13 voters	100%

Challenge III: Reduce negative impacts of tourists' behavior on local communities and environment

This challenge arises from the fact that it is important to ensure that tourism does not cause harm to the nature, local environment, social and cultural wellbeing of the local residents. Tourism services should not be steered and provided to visitors in ways that risk harming the local environment, culture or its people. This would reduce the attractiveness of the destination over the long term by reducing its environmental and cultural authenticity.

As shown in the table, an **average rating of 4.7** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, local/Residents' satisfactions and emotions, and tourists' satisfaction & emotions** were considered the most useful data to solve this challenge.

Table 5 – Increase of tourism sustainability & accessibility challenge 3 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.7</p> <p style="text-align: center;">0 % 0 % 0 % 33 % 67 %</p>	Behavior of tourists	18%
	Local/Residents' satisfactions and emotions	15%
	Tourists' satisfaction & emotions	12%
	Tourists flow	10%
	Mobility data	10%
	Sustainability data	10%
	Typology of tourists	10%
	Purchase habits	9%
	Demand and offer data	6%
	Accessibility data	0%
	Related industry data	0%
	12 voters	12 voters

Challenge IV: Meet the demand for more sustainable tourism

A Eurobarometer survey from October 2021 indicated that 82% of Europeans are willing to change their travel habits for more sustainable practices, including consuming locally sourced products, reducing waste and water consumption, travelling off-season or to less visited destinations and choosing transport options based on their ecological impact. Accordingly, this challenge pertains to the fact that consumers' choices must be empowered, through more transparent information about the sustainability and environmental footprints of the destinations/tourism services.

As shown in the table, an **average rating of 4.5** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, sustainability data, and tourists flows** were considered the most useful data to solve this challenge.

Table 6– Increase of tourism sustainability & accessibility challenge 4 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.5</p> <p style="text-align: center;"> 0 % 0 % 8 % 33 % 58 % </p>	Behavior of tourists	15%
	Sustainability data	13%
	Tourists flow	13%
	Demand and offer data	13%
	Mobility data	10%
	Purchase habits	10%
	Typology of tourists	10%
	Tourists' satisfaction & emotions	6%
	Local/Residents' satisfactions and emotions	5%
	Related industry data	5%
	Accessibility data	2%
12 voters	12 voters	100%

Challenge V: Measure and reduce environmental footprint

The challenge of measuring and reducing the environmental footprint arises from the fact that comprehensive data collection by industry and sectoral category rules development is required to be able to compare data within a sector or product category on 'average', 'low' or 'good' performance. R&I is needed to help develop sectoral category rules development for specific tourism products and services in a transparent, non-discriminatory manner (e.g. considering peripheral destinations that need to import products). Tools and technologies are also needed to make applying the environmental footprint method more user friendly for SMEs. This would make the methodology accessible to them and facilitate data collection on the environmental footprint calculation to monitor the industry's development on sustainability.

As shown in the table, an **average rating of 4.6** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, sustainability data, and mobility data** were considered the most useful data to solve this challenge.

Table 7– Increase of tourism sustainability & accessibility challenge 5 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.6</p> <p style="text-align: center;"> 0 % 0 % 8 % 23 % 69 % </p>	Behavior of tourists	17%
	Sustainability data	16%
	Mobility data	14%
	Tourists flow	14%
	Related industry data	11%
	Purchase habits	10%
	Demand and offer data	6%
	Typology of tourists	5%
	Accessibility data	3%
	Local/Residents' satisfactions and emotions	3%
	Tourists' satisfaction & emotions	0%
	13 voters	13 voters

Challenge VI: Sustainable mobility

The European Green Deal calls for a 90% reduction in greenhouse gas emissions from transport, in order for the EU to become a climate-neutral economy by 2050, while also working towards a zero-pollution ambition. To achieve this systemic change, we need to make sustainable alternatives widely available. Accordingly, this challenge relates to the fact that immediate actions to adapt mobility system are necessary to tackle climate change and reduce pollution.

As shown in the table, an **average rating of 4.4** out of 5 was given to this challenge. Correspondingly, **mobility data, behavior of tourists, and tourists flow** were considered the most useful data to solve this challenge.

Table 8– Increase of tourism sustainability & accessibility challenge 6 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.4</p> <p style="text-align: center;">12 voters</p>	Mobility data	27%
	Behavior of tourists	16%
	Tourists flow	16%
	Sustainability data	13%
	Demand and offer data	9%
	Related industry data	7%
	Accessibility data	4%
	Purchase habits	4%
	Tourists' satisfaction & emotions	2%
	Typology of tourists	2%
	Local/Residents' satisfactions and emotions	0%
	12 voters	12 voters

Challenge VII: Improve the supply and visibility of accessible tourism services

Development and diversification of tourism products and services aimed at ensuring equal access to tourist destinations and cultural heritage. Accessible and inclusive tourism is a key to helping all people participate fully in society. There are approximately 87 million people with some form of disability in the EU⁴, and in 2020, 20.6% of the EU population was aged 65 or over⁵. It is therefore important to ensure the supply of accessible tourism facilities in all destinations and provide clear and accessible related information to travellers planning and reserving their stays and activities. Moreover, based on Eurostat statistics from 2019, 35% of EU residents of 15 years or older did not make overnight trips⁶. The share of older people not doing overnight trips was higher than younger people, and 52% of persons not doing overnight trips mentioned financial reasons for it. Access for all to tourism could be boosted by developing moderately

⁴ https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6568


⁵ <https://www.disability-europe.net/downloads/1046-edc-task-2-1-statistical-indicators-tables-eu-silc-2018>

⁶ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_trends_and_ageing#Nearly_half_of_the_Europeans_aged_65.2B_who_did_not_make_tourism_trips_mentioned_health_reasons

priced off-season accommodation and travelling opportunities for unemployed, retired and people with low income.

As shown in the table, an **average rating of 4.3** out of 5 was given to this challenge. Correspondingly, **mobility data, accessibility data, and demand and offer data** were considered the most useful data to solve this challenge.

Table 9– Increase of tourism sustainability & accessibility challenge 7 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.3</p>  <p style="text-align: center;"> 0 % 0 % 17 % 42 % 42 % </p>	Mobility data	16%
	Accessibility data	16%
	Demand and offer data	15%
	Behavior of tourists	10%
	Tourists flow	10%
	Typology of tourists	10%
	Tourists' satisfaction & emotions	9%
	Related industry data	7%
	Sustainability data	3%
	Purchase habits	1%
	Local/Residents' satisfactions and emotions	0%
	12 voters	12 voters

Challenges ranking

Participants were then asked to rank the seven presented challenges. Accordingly, the challenges were ranked in the following way⁷:

1. Support the growth of sustainable parameters awareness among the tourism industry
2. Meet the demand for more sustainable tourism and reduce negative impacts of tourists' behavior on local communities and environment
3. Measure and reduce environmental footprint
4. Sustainable mobility
5. Manage tourism seasonality
6. Improve the supply and visibility of accessible tourism services

Missing challenges

Participants were then asked, through an open question, to investigate whether there was any missing challenge concerning the data purpose of the break out room, with a corresponding rate out of 5 and the data needed to address it. Accordingly, the following themes emerged:

- Spreading a new culture of sustainability in tourist operators. Rating 4/5

⁷ Such ranking was calculated assigning a weight to each of the rank positions. Therefore, the highest weight was assigned to each vote ranking the purpose as the most important (1st) and so on. Then, the final ranking is based on the sum of all the products of the number of votes for a ranking position times the weight assigned to that rank position.

- Importance of relationship/influence among environmental/biodiversity indicators and economic indicators in the tourism sector. Rating 4/5

Break out room 2: Conduct market analysis and inform decision making

Moderators: Dolores Ordóñez from Anysolution

The second break out room was dedicated to the data purpose of conducting market analysis and informing decision making. Indeed, higher availability of data and improved data analytics capabilities allow improvements in market analysis and decision-making. For this specific data purpose, the project team uncovered 8 challenges: the respective findings of each of them are illustrated below.

Challenge I: Develop effective business strategies and make investment decisions

The challenge of developing effective business strategies and make investment decisions arises from the fact that both private businesses and public authorities need to ground their strategic and investment decisions on reliable information. The enhancement of data availability, data quality, and quality analysis are crucial for decision making. Accordingly, the combination and interoperability of the many available data sources can help tourism players in extracting meaningful insights, improving their strategies and the way priorities are defined and budget allocated.

As shown in the table, an **average rating of 4.3** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, demand and offer data, and sustainability data** were considered the most useful data to solve this challenge.

Table 10– Conduct market analysis and inform decision making challenge 1 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.3</p> <div style="display: flex; justify-content: space-around; align-items: center;"> ★ ★ ★ ★ ☆ </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> 5 % 0 % 5 % 40 % 50 % </div> <p style="text-align: center; margin-top: 10px;">20 voters</p>	Behavior of tourists	14%
	Demand and offer data	12%
	Sustainability data	11%
	Typology of tourists	11%
	Mobility data	9%
	Tourists flow	8%
	Accessibility data	8%
	Local/Residents' satisfactions and emotions	7%
	Tourists' satisfaction & emotions	7%
	Purchase habits	7%
	Related industry data	5%
	20 voters	20 voters

Challenge II: Monitor the flow of visitors between districts and attractions

Often tourism destination and attractions are “overwhelmed” and suffer from “overtourism” (e.g. Venice). In the case of cities, the population of the historical city center has been constantly falling (e.g. Venice - 70% from its peak in the 1950s), as residents move to escape the nuisances of tourists and price increases and to conveniently make their homes available to online vacation rentals operators, such as most notably Airbnb (“airbnbification”). Moreover, “overtourism” also generates a set of other challenges, including of

the effectiveness of public services, conservation of the cultural heritage (tangible and intangible), and management of security risks. For these reasons, cities and points of interest (heritage sites, natural parks, routes etc...) need a solution to better manage the flows of tourists. The challenge of managing large tourists flows can be also linked to specific large events (e.g. festivals, expo...).

As shown in the table, an **average rating of 4.0** out of 5 was given to this challenge. Correspondingly, **mobility data, tourists flows, and behavior of tourists** were considered the most useful data to solve this challenge.

Table 11– Conduct market analysis and inform decision making challenge 2 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; color: blue;">4.0</p> <p style="text-align: center;">5 % 5 % 14 % 36 % 41%</p>	Mobility data	18%
	Tourists flow	17%
	Behavior of tourists	14%
	Sustainability data	9%
	Local/Residents' satisfactions and emotions	9%
	Demand and offer data	8%
	Tourists' satisfaction & emotions	8%
	Purchase habits	6%
	Typology of tourists	5%
	Accessibility data	5%
	Related industry data	1%
	22 voters	22 voters

Challenge III: Answer to the so-called request for “hyper personalization” of travel experiences

Following the Covid-19 pandemic, there is a constantly increasing request for the hyper personalization of the travelling experiences. Developing hyper-personalized strategies presents a critical challenge; due to this, optimizing hyper-personalization and designing new processes and business models takes center stage in tourism and hospitality to reach new levels of customer service and experience through the introduction and development of new solutions supported in the internet of things, software interfaces, artificial intelligence solutions, back-end and front-end management tools, and other emergent business intelligence strategies.

As shown in the table, an **average rating of 3.3** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, typology of tourists and tourists' satisfaction & emotions** were considered the most useful data to solve this challenge.

Table 12– Conduct market analysis and inform decision making challenge 3 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">3.3</p> <p style="text-align: center;">4 % 4 % 52 % 30 % 8 %</p> <p style="text-align: center;">23 voters</p>	Behavior of tourists	19%
	Typology of tourists	17%
	Tourists' satisfaction & emotions	13%
	Purchase habits	12%
	Demand and offer data	9%
	Mobility data	8%
	Tourists flow	6%
	Sustainability data	5%
	Local/Residents' satisfactions and emotions	4%
	Accessibility data	4%
	Related industry data	4%
		23 voters

Challenge IV: Assess impacts of events and infrastructure investments

Events attracting big amounts of attendants have positive impact on the local economy, on the visibility and reputation of the location and on the cultural environment of the destination. At the same time, they might have negative spillovers. For this reason, the challenge of assessing impacts of events and infrastructure investments arises. The challenge of assessing economic, social and environmental impact of any activity is always increasing thanks to the 2030 Sustainable Development Goals agenda and the increasing awareness and demand of tourists. Similar reasoning can be applied to investment in tourism-related infrastructure (e.g. airports, streets, railways, new bus lines etc). Forecasting impacts can help in reducing the negative spillovers.

As shown in the table, an **average rating of 3.8** out of 5 was given to this challenge. Correspondingly, **sustainability data, mobility data, and tourists flow** were considered the most useful data to solve this challenge.

Table 13– Conduct market analysis and inform decision making challenge 4 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">3.8</p> <p style="text-align: center;">23 voters</p>	Sustainability data	14%
	Mobility data	12%
	Tourists flow	12%
	Behavior of tourists	10%
	Local/Residents' satisfactions and emotions	10%
	Demand and offer data	9%
	Accessibility data	9%
	Tourists' satisfaction & emotions	6%
	Purchase habits	6%
	Typology of tourists	6%
	Related industry data	6%
		24 voters

Challenge V: Crisis management

The challenge of crisis management stems from the fact that the tourism industry and supply chain can be suddenly disrupted if a dramatic event (e.g. pandemic, natural catastrophes, terrorists attack etc) takes place. Accordingly, having updated information on these elements can help decision making regarding risk management, disaster management and recovery. In a nutshell, reliable information can support the pathway towards resilience.

As shown in the table, an **average rating of 4.0** out of 5 was given to this challenge. Correspondingly, **mobility data, tourists flow, and related industry data** were considered the most useful data to solve this challenge.

Table 14– Conduct market analysis and inform decision making challenge 5 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.0</p> <p style="text-align: center;">23 voters</p>	Mobility data	18%
	Tourists flow	12%
	Related industry data	12%
	Behavior of tourists	11%
	Tourists' satisfaction & emotions	10%
	Demand and offer data	9%
	Sustainability data	8%
	Accessibility data	8%
	Typology of tourists	5%
	Local/Residents' satisfactions and emotions	4%
	Purchase habits	3%
		23 voters

Challenge VI: Incentive collaboration among different types of stakeholders

Tourism is an industry that involves a wide variety of stakeholders. For this reason, vertical and horizontal governance are key for its success. Having information on points of convergence between central/regional/local public authorities and private market players can incentivize collaboration (e.g. PPP, collaboration between central and local PA, between private market players etc) for common purposes (e.g. tourism development strategies at public level and partnership even with competitors at private level).

As shown in the table, an **average rating of 4.3** out of 5 was given to this challenge. Correspondingly, **demand and offer data, tourists flow, and tourists' satisfaction & emotions** were considered the most useful data to solve this challenge.

Table 15– Conduct market analysis and inform decision making challenge 5 results

Average rating	Type of data that are most useful to solve the challenge	Percentage	
<p style="text-align: center; font-size: 2em; color: #4F81BD;">4.3</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">★</div> <div style="text-align: center;">★</div> <div style="text-align: center;">★</div> <div style="text-align: center;">★</div> <div style="text-align: center;">★</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> 0 % 0 % 19 % 30 % 50 % </div> <p style="text-align: center; margin-top: 10px;">26 voters</p>	Demand and offer data	16%	
	Tourists flow	11%	
	Tourists' satisfaction & emotions	10%	
	Typology of tourists	10%	
	Mobility data	8%	
	Related industry data	8%	
	Behavior of tourists	8%	
	Local/Residents' satisfactions and emotions	8%	
	Purchase habits	8%	
	Sustainability data	7%	
	Accessibility data	6%	
		26 voters	100%

Challenge VII: Manage the tourists-residents relationship

Tourism can be an opportunity for local communities, either from an economic perspective (increase revenues for local businesses, more business opportunities) and from a social perspective (increased employment, increased services innovation, exposure to different cultures). At the same time, when tourism turns into "overtourism", the negative sides might be more than the positive ones (e.g. increase of prices for local communities, loss of places liveliness etc...), and this is why the challenge of managing the tourists-residents relationship arises. Being aware of benefits and problems might help public authorities in making decision managing tourism in a way that maximizes the positive sides and minimize the negative ones.

As shown in the table, an **average rating of 4.2** out of 5 was given to this challenge. Correspondingly, **local/residents' satisfactions and emotions, tourists flow, and tourists' satisfaction & emotions** were considered the most useful data to solve this challenge.

Table 16– Conduct market analysis and inform decision making challenge 7 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; color: blue;">4.2</p> <p style="text-align: center;"> 0 % 0 % 28 % 24 % 48 % </p> <p style="text-align: center;">25 voters</p>	Local/Residents' satisfactions and emotions	17%
	Tourists flow	13%
	Tourists' satisfaction & emotions	13%
	Behavior of tourists	13%
	Typology of tourists	10%
	Mobility data	10%
	Sustainability data	7%
	Demand and offer data	7%
	Accessibility data	4%
	Purchase habits	4%
	Related industry data	2%
	25 voters	25 voters

Challenge VIII: Cultural shift regarding tourism sector data sharing

All the aforementioned challenges can be addressed through the use of data. The availability of the data is key. For this reason, it is important that tourism-related data producers (and users) understand the benefits of data sharing and commit to enhance data availability and accessibility. Indeed, at the moment, tourism industry is facing a data silos problem, meaning that data are produced and kept at company/public authority level but there is no data infrastructure enabling their exchange. At the same time, data producers/holders might be afraid that sharing some kind of data could somehow result in a damage for their organization. For this reason, they wish to keep control over their data and decide when/how/with whom to share their data. A data space for the tourism sector aims exactly at solving this dichotomy: it enhances data sharing while it ensures owners' control over the data.

As shown in the table, an **average rating of 4.1** out of 5 was given to this challenge. Correspondingly, **typology of tourists, demand and offer data, and related industry data** were considered the most useful data to solve this challenge.

Table 17– Conduct market analysis and inform decision making challenge 8 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; color: blue;">4.1</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">★ 4 %</div> <div style="text-align: center;">★ 0 %</div> <div style="text-align: center;">★ 25 %</div> <div style="text-align: center;">★ 25 %</div> <div style="text-align: center;">★ 45 %</div> </div>	Typology of tourists	12%
	Demand and offer data	12%
	Related industry data	12%
	Mobility data	11%
	Purchase habits	9%
	Tourists flow	9%
	Behavior of tourists	9%
	Sustainability data	9%
	Tourists' satisfaction & emotions	7%
	Accessibility data	7%
	Local/Residents' satisfactions and emotions	5%
24 voters	24 voters	100%

Challenges ranking

Participants were then asked to rank the six presented challenges. Accordingly, the challenges were ranked in the following way⁸:

1. Develop effective business strategies & make investment decisions
2. Monitor the flow of visitors between districts and attractions
3. Incentivize collaboration among different types of stakeholders
4. Cultural shift regarding tourism sector data sharing
5. Assess impacts of events and infrastructure investments
6. Answer to the so-called “hyper personalization” of travel experiences
7. Manage the tourists-residents relationship
8. Crisis management

Missing challenges

Participants were then asked, through an open question, to investigate whether there was any missing challenge concerning the data purpose of the breakout room, with a corresponding rate out of 5 and the data needed to address it. Accordingly, the following themes emerged:

- Standardization on accommodations and other touristic resources. Ranking 4/5
- Measurement of the impact of implemented policies, using long term key performance indicators
- Challenges regarding energy and resources savings (e.g. water, food...)
- Challenges related to relation between tourism and health

⁸ Such ranking was calculated assigning a weight to each of the rank positions. Therefore, the highest weight was assigned to each vote ranking the purpose as the most important (1st) and so on. Then, the final ranking is based on the sum of all the products of the number of votes for a ranking position times the weight assigned to that rank position.

Break out room 3: Improvement of the interaction and engagement of the tourist

Moderators: Danilo Bianchini from Intellera Consulting

The third breakout room was dedicated to the data purpose of improving the interaction and engagement of the tourist, which implies the development of tourism services that are increasingly personalized and based on a higher degree of interaction with the customer/end user. For this specific data purpose, the project team uncovered 6 challenges: the respective findings of each of them are illustrated below.

Challenge I: Address the demand/needs of tourists of different generations

Due to sociodemographic trends, the EU tourist sector will see demand changes in the short, medium and long term. For example, Baby Boomers will become the oldest target group in the coming decades, with the highest spending capacity, but with lower digital skills than the other groups of interest. They will progressively require a set of personalized touristic services based on a combination of health and cultural tourism. Similarly, millennials, generations Z and Y are/will be highly digitally skilled tourists, but with lower spending capacity than their parents. Moreover, generations Y and Z have the propensity to remain online, and are more likely to ask for more inclusive and interconnected digital solutions and adopt a more ethical lifestyle.

As shown in the table, an **average rating of 3.8** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, typology of tourists, and demand and offer data** were considered the most useful data to solve this challenge.

Table 18– Improvement of the interaction and engagement of the tourist challenge 1 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">3.8</p> <p style="text-align: center;">6 % 0 % 25 % 44 % 25 %</p> <p style="text-align: center;">16 voters</p>	Behavior of tourists	17%
	Typology of tourists	17%
	Demand and offer data	11%
	Tourists' satisfaction & emotions	11%
	Accessibility data	9%
	Purchase habits	9%
	Mobility data	8%
	Tourists flow	7%
	Sustainability data	5%
	Local/Residents' satisfactions and emotions	4%
	Related industry data	1%
		16 voters

Challenge II: Develop innovative immersive and digital tourism experiences

Consistently with the sociodemographic trends described in the previous challenge, tourists are and will always be asking more immersive and digital experiences. For example, virtual and augmented reality services enable real-like visitor experiences and might extend the participation to tourism services before and after the travel experience. R&I in this area could provide new innovative, sustainable and accessible

forms of tourism services, with innovative technologies that can be used to provide new ways to help preserve natural and cultural resources at risk.

As shown in the table, an **average rating of 3.8** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, typology of tourists, and tourists' satisfaction & emotions** were considered the most useful data to solve this challenge.

Table 19 - Improvement of the interaction and engagement of the tourist challenge 2 results


Average rating	Type of data that are most useful to solve the challenge	Percentage
<p>3.8</p> <p>0% 14% 7% 64% 14%</p> <p>14 voters</p>	Behavior of tourists	24%
	Typology of tourists	13%
	Tourists' satisfaction & emotions	13%
	Demand and offer data	9%
	Tourists flow	9%
	Purchase habits	7%
	Accessibility data	6%
	Mobility data	6%
	Sustainability data	6%
	Local/Residents' satisfactions and emotions	4%
	Related industry data	4%
		14 voters

Challenge III: Improve tourists' experience by providing information on tourism flows

This challenge pertains to the fact that information regarding the amount of people actually visiting a specific point of interest and information regarding the most crowded moments will surely allow residents and tourists to make their visits safer and more comfortable. For this purpose, some cities have already installed a network of devices that collect anonymous real time data from a crowd stream by detecting Bluetooth devices. Moreover, such devices can also transmit messages to the users, who can receive information and live suggestions regarding discounts, activities, events, or new routes for visitors, directly on their smartphones.

As shown in the table, an **average rating of 4.2** out of 5 was given to this challenge. Correspondingly, **mobility data, behavior of tourists, and tourists flow** were considered the most useful data to solve this challenge.

Table 20– Improvement of the interaction and engagement of the tourist challenge 3 results

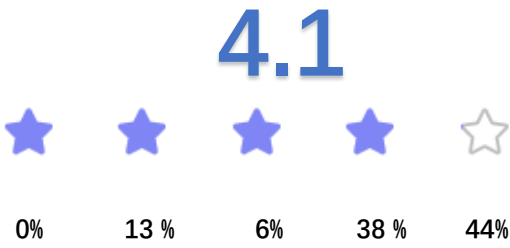
Average rating	Type of data that are most useful to solve the challenge	Percentage
 <p>4.2</p>	Mobility data	18%
	Behavior of tourists	17%
	Tourists flow	17%
	Accessibility data	10%
	Local/Residents' satisfactions and emotions	10%
	Tourists' satisfaction & emotions	7%
	Typology of tourists	6%
	Sustainability data	6%
	Purchase habits	5%
	Demand and offer data	2%
	Related industry data	2%
	16 voters	16 voters

Challenge IV: Manage online reputation and leverage on tourists' satisfactions

In the last decades, the impact of traditional “word of mouth” has been amplified by the tourists' active use of Internet. During and following their travelling experience, tourists often publish online information regarding their satisfaction and emotions (“sentiment”) which can of course improve or damage tourism stakeholders. The sentiment analysis - based on the Natural language processing (NLP) - permits to measure the level of satisfaction expressed online regarding a service, a product or a brand. Being aware of one's own reputation can help in designing strategies on how to engage the customers and improve their satisfaction.

As shown in the table, an **average rating of 4.1** out of 5 was given to this challenge. Correspondingly, **tourists' satisfaction and emotions, local/residents' satisfactions and emotions, and behavior of tourists** were considered the most useful data to solve this challenge.

Table 21 - Improvement of the interaction and engagement of the tourist challenge 4 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
 <p>4.1</p> <p>0% 13% 6% 38% 44%</p>	Tourists' satisfaction & emotions	21%
	Local/Residents' satisfactions and emotions	18%
	Behavior of tourists	12%
	Typology of tourists	12%
	Demand and offer data	11%
	Accessibility data	8%
	Purchase habits	6%
	Tourists flow	5%
	Sustainability data	5%
	Mobility data	3%
	Related industry data	0%
	16 voters	17 voters

Challenge V: Reach potential clients without being fully dependent on OTAs

Nowadays tourists are able to choose, configure and assemble a highly customized journey, instead of asking for a package from a travel agent or a website. They reduced the use of intermediation channels if they do not provide a higher added value than an online website. Together with the raise of cashless payments, this process incentivized the use of online intermediaries, highlighting the need to compare or aggregate tourism supply (e.g. online travel agencies – or OTAs – search engines, and price comparison platforms). On one side, these intermediaries give visibility to tourism players' offers and help them in reaching potential clients, on the other side, they are so widespread that it is extremely difficult for players to reach clients without referring to such platforms. Additionally, these platforms generate large amounts of data that put them in an always privileged position. Data availability could help tourism stakeholders (HORECA in particular) in finding ways to reach (potential) clients without using OTAs.

As shown in the table, an **average rating of 4.4** out of 5 was given to this challenge. Correspondingly, **demand and offer data, behavior of tourists, and typology of tourists** were considered the most useful data to solve this challenge.

Table 22– Improvement of the interaction and engagement of the tourist challenge 5 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p>4.4</p> <p>0% 0% 18% 29% 53%</p> <p>17 voters</p>	Demand and offer data	19%
	Behavior of tourists	17%
	Typology of tourists	17%
	Purchase habits	17%
	Related industry data	9%
	Tourists' satisfaction & emotions	7%
	Accessibility data	4%
	Sustainability data	4%
	Tourists flow	3%
	Mobility data	3%
	Local/Residents' satisfactions and emotions	0%
	17 voters	17 voters

Challenge VI: Create and manage a relation with tourists

A lot of effort is required especially by small tourism businesses to attract new customers. It makes sense then to consider the potential for stimulating repeat visits and/or referrals from them, because it can a more efficient use of scarce resources to stay in touch with previous customers than to spend on advertising to attract a continual stream of new ones. CRM loyalty programs that provide economic incentives have a positive effect on customer retention and market share. A small increase in the number of loyal customers can result in reduced marketing costs, increased sales, and higher profits. While traditional promotional activities are necessary to attract new customers, there are opportunities for (especially) small tourism businesses to supplement these with initiatives to increase loyalty.

As shown in the table, an **average rating of 3.8** out of 5 was given to this challenge. Correspondingly, **purchase habits, behavior of tourists, and typology of tourists** were considered the most useful data to solve this challenge.

Table 23– Improvement of the interaction and engagement of the tourist challenge 6 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p>3.8</p> <p>0% 0% 38% 38% 23%</p> <p>13 voters</p>	Purchase habits	20%
	Behavior of tourists	19%
	Typology of tourists	17%
	Tourists' satisfaction & emotions	16%
	Demand and offer data	11%
	Accessibility data	5%
	Local/Residents' satisfactions and emotions	5%
	Mobility data	3%
	Tourists flow	2%
	Sustainability data	2%
	Related industry data	2%
	13 voters	13 voters

Challenges ranking

Participants were then asked to rank the six presented challenges. Accordingly, the challenges were ranked in the following way⁹:

1. Improve tourists' experiences by providing information on tourism flows
2. Reach potential clients without being fully dependent on OTAs
3. Address the demand/needs of tourists of different generations
4. Create and manage a relation with tourists
5. Manage online reputation and leverage on tourists' satisfaction
6. Develop innovative immersive and digital tourism experiences

Missing challenges

Participants were then asked, through an open question, to investigate whether there was any missing challenge concerning the data purpose of the breakout room, with a corresponding rate out of 5 and the data needed to address it. Accordingly, the following themes emerged:

- Balance tourists-related companies/organizations' interest to engage with tourists' with their (possible) desire not to be overwhelmed by lot of information

⁹ Such ranking was calculated assigning a weight to each of the rank positions. Therefore, the highest weight was assigned to each vote ranking the purpose as the most important (1st) and so on. Then, the final ranking is based on the sum of all the products of the number of votes for a ranking position times the weight assigned to that rank position.

Break out room 4: Improvement of planning and operations of the tourism service

Moderators: Marco Codastefano from Intellera Consulting

The fourth break out room was dedicated to the data purpose of improving the planning and operations of the tourism service. This implies that understanding, and possibly predicting tourism patterns through data can help to improve the overall efficiency and competitiveness of the tourism ecosystem. For this specific data purpose, the project team uncovered 5 challenges: the respective findings of each of them are illustrated below.

Challenge I: Understand and better forecast the tourism flow

The challenge of understanding and better forecasting the tourism flow relates to the fact that tourism enterprises are facing growing uncertainty. They will need to collect as much data as possible to cover the gaps in the decision-making process. A key factor to boost competitiveness is to make better and more innovative use of data, so that operators are able to anticipate demand for their services, analyze customer profiles and business trends, and ultimately provide a better customer experience.

As shown in the table, an **average rating of 4.6** out of 5 was given to this challenge. Correspondingly, **tourist flow, behavior of tourists, and mobility data** were considered the most useful data to solve this challenge.

Table 24– Improvement of planning and operations of the tourism service challenge 1 results


Average rating	Type of data that are most useful to solve the challenge	Percentage
<p>4.6</p> <p>0% 0% 0% 35% 65%</p>	Tourists flow	14%
	Behavior of tourists	12%
	Mobility data	12%
	Demand and offer data	10%
	Tourists' satisfaction & emotions	10%
	Purchase habits	10%
	Local/Residents' satisfactions and emotions	9%
	Accessibility data	8%
	Sustainability data	7%
	Typology of tourists	7%
	Related industry data	4%
17 voters	17 voters	100%

Challenge II: Manage seasonality in the tourism sector

Seasonality of demand is generally considered one of the major challenges in the tourism business. Destinations with high fluctuations in seasonality often face various challenges, such as overcrowding, high prices, inadequate infrastructure in peak seasons, as well as a lack of services and job opportunities in shoulder and low seasons. Accordingly, seasonality is a measurable feature with significant economic and social impacts. Understanding the main characteristics can help to modify its occurrence.

As shown in the table, an **average rating of 4.3** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, demand and offer data, and typology of tourists** were considered the most useful data to solve this challenge.

Table 25– Improvement of planning and operations of the tourism service challenge 2 results

Average rating	Type of data that are most useful to solve the challenge	Percentage	
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.3</p>  <p style="text-align: center;"> 0% 0% 15% 42% 42% </p> <p style="text-align: center;">19 voters</p>	Behavior of tourists	16%	
	Demand and offer data	14%	
	Typology of tourists	12%	
	Tourists flow	11%	
	Tourists' satisfaction & emotions	10%	
	Sustainability data	10%	
	Purchase habits	9%	
	Local/Residents' satisfactions and emotions	8%	
	Mobility data	5%	
	Accessibility data	2%	
	Related industry data	2%	
	19 voters	19 voters	100%

Challenge III: Manage and reduce overcrowding of sites and services

Depending on the type of destination and characteristics of its attractions, tourism flows can present more or less clear or recurring patterns – such in relation to seasonal attractions or specific landmark/sites. It is important to create innovative tourism services that manage tourism flows based on real-time data (e.g. crowd management at attractions). Data driven destination management tools, practices and technologies are needed to boost the sustainability of tourist destinations and reduce overcrowding of sites and services.

As shown in the table, an **average rating of 4.0** out of 5 was given to this challenge. Correspondingly, **behavior of tourists, tourist flow, and local/residents' satisfaction and emotions** were considered the most useful data to solve this challenge.

Table 26– Improvement of planning and operations of the tourism service challenge 3 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.0</p> <p style="text-align: center;">18 voters</p>	Behavior of tourists	14%
	Tourists flow	14%
	Local/Residents' satisfactions and emotions	12%
	Mobility data	12%
	Demand and offer data	11%
	Typology of tourists	9%
	Tourists' satisfaction & emotions	9%
	Sustainability data	9%
	Purchase habits	4%
	Accessibility data	4%
	Related industry data	2%
	18 voters	18 voters

Challenge IV: Multimodal ticketing – smart mobility

This challenge arises from the fact that in the transportation sector, tracking and identifying tourists will become increasingly important. The technologies for controlling mobility and access will be key in this aspect. Digitalization of the tourism ecosystem makes it increasingly easy to find and book journey tickets online. However, this is not easy if the door-to-door trip requires multimodal transport, for example combining air, train and local transport. The digital transformation of the transport and mobility sector requires further efforts related to data availability, access and exchange.

As shown in the table, an **average rating of 4.1** out of 5 was given to this challenge. Correspondingly, **mobility data, behavior of tourists, and demand and offer data** were considered the most useful data to solve this challenge.

Table 27– Improvement of planning and operations of the tourism service challenge 4 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">4.1</p> <p style="text-align: center;">18 voters</p>	Mobility data	14%
	Behavior of tourists	12%
	Demand and offer data	12%
	Accessibility data	12%
	Tourists flow	11%
	Typology of tourists	9%
	Purchase habits	9%
	Tourists' satisfaction & emotions	7%
	Sustainability data	6%
	Local/Residents' satisfactions and emotions	4%
	Related industry data	4%
	18 voters	18 voters

Challenge V: Manage online reputation and leverage on tourists' satisfaction

The challenge of managing online reputation and leverage on tourists' satisfaction concerns the fact that user-generated content is an important data source to explore tourist satisfaction and understand how to improve guest experience, competitive positioning and marketing activities. The analysis of these data allows to understand tourist behavior in a view to developing travel recommendation systems and improve marketing activities, with a view of improving overall efficiency and competitiveness of the tourism ecosystem.

As shown in the table, an **average rating of 3.9** out of 5 was given to this challenge. Correspondingly, **tourists' satisfaction & emotions, behavior of tourists, and local/residents' satisfactions and emotions** were considered the most useful data to solve this challenge.

Table 28– Improvement of planning and operations of the tourism service challenge 5 results

Average rating	Type of data that are most useful to solve the challenge	Percentage
<p style="text-align: center; font-size: 2em; font-weight: bold;">3.9</p> <p style="text-align: center;">5% 11% 5% 38% 38%</p> <p style="text-align: center;">18 voters</p>	Tourists' satisfaction & emotions	22%
	Behavior of tourists	20%
	Local/Residents' satisfactions and emotions	14%
	Typology of tourists	14%
	Demand and offer data	12%
	Accessibility data	7%
	Tourists flow	5%
	Purchase habits	5%
	Related industry data	2%
	Mobility data	0%
	Sustainability data	0%
		17 voters

Challenges ranking

Participants were then asked to rank the five presented challenges. Accordingly, the challenges were ranked in the following way¹⁰:

1. Understand and better forecast the tourism flow
2. Manage seasonality in tourism sector
3. Manage and reduce overcrowding of sites and services
4. Manage online reputation and leverage on tourists' satisfaction
5. Multimodal ticketing – smart mobility

¹⁰ Such ranking was calculated assigning a weight to each of the rank positions. Therefore, the highest weight was assigned to each vote ranking the purpose as the most important (1st) and so on. Then, the final ranking is based on the sum of all the products of the number of votes for a ranking position times the weight assigned to that rank position.

Missing challenges

Participants were then asked, through an open question, to investigate whether there was any missing challenge concerning the data purpose of the breakout room, with a corresponding rate out of 5 and the data needed to address it. Accordingly, the following themes emerged:

- Need to inform all visitors and local residents about (temporary) closures of infrastructure (e.g. sights, hiking tracks, cycling routes, wildlife areas, avalanche danger zones...) before they come to closed locations and need to change plans on the spot. Rating 5/5
- Need to consider weather data for the improvement of planning and operations of tourism services

4. Next steps

As mentioned above, the team will use the evidence collected from the workshop for defining the use cases of the European data space for tourism. More specifically, starting from the challenges with the highest priority, the Team will carry out desk research and will organize a workshop (in **March**) to develop and discuss the use cases.

Such use cases will also be at the base of defining the data space technical and governance requirements. Consultations related to these topics will take place in the **upcoming months**.

5. Slides of the workshop

This section presents the slides used during the workshop Section I: A European Data Space for the tourism sector, in the following order:

- I. Rules, agenda, workshop objectives and participant distribution
- II. Objectives of DATES and the benefits for the tourism sector
- III. Data spaces – the policy
- IV. The dataspace for Mobility, Tourism & Transport
- V. First results
- VI. Break out room set up



This project has received funding from the Digital Europe Programme under Grant Agreement No 101084007

Workshop - Towards a data space for tourism - Prioritization of data needs and purposes

Welcome!

House keeping rules

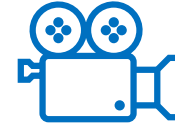
Just three simple rules for this workshop



Mute your mike



Ask questions in the chat



This session will be recorded

Workshop Objectives

Session I

01

Understanding the concept of Data Spaces

Presentation of the DATES project and its policy context.
Showcase of the key features of a data space, its definition and a practical example.
Present the first results of the project

Session II

02

Definition and prioritization of the main business challenges

Understanding of the main challenges faced in the tourism sector and prioritization of the ones that could be potentially be solved by a data space.

03

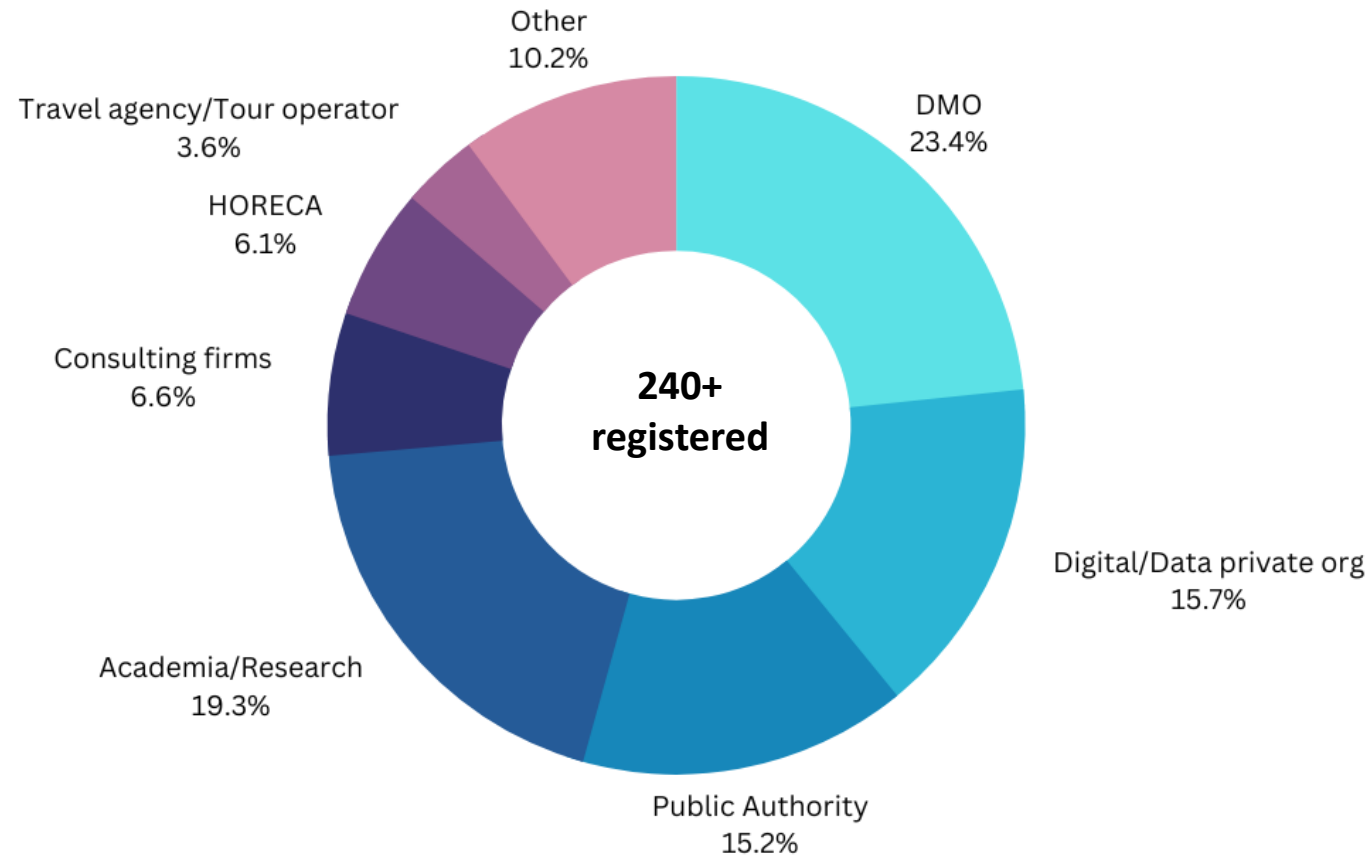
Priotization of data needs

Prioritization of data needs based on the most relevant challenges emerged. Such prioritization will be the ground for the definition of use cases.

Today's agenda

Time	Session	Contributor
Section I – A European data space for the tourism sector		
10:00 – 10:05	Welcome	Giovanna Galasso – Associate Partner – Intellera Consulting
10:05 – 10:15	Objectives of DATES and the benefits for the tourism sector	Dolores Ordóñez – DATES Project coordinator Director - Anysolution
10:15 – 10:45	The concept of data spaces	Árpád Welker – Policy Officer – European Commission DG CNECT & Jean-François Cases – Amadeus President – EONA X
10:45 – 10:55	First results concerning data sharing initiatives	Marco Codastefano – Manager – Intellera Consulting
10:55 – 11:00	Introduction to the breakout rooms	Danilo Bianchini – Manager – Intellera Consulting
Break (11:00-11:10)		
Section II – Connecting the dots		
11:10 – 12:00	Data needs prioritization workshop	Italian Ministry of Tourism, Intellera, Anysolution
12:00 – 12:15	Discussion and closing remarks	

Who are we in this workshop?



OBJECTIVES OF DATES AND THE BENEFITS FOR THE TOURISM SECTOR

Dolores Ordóñez – Director - Anysolution

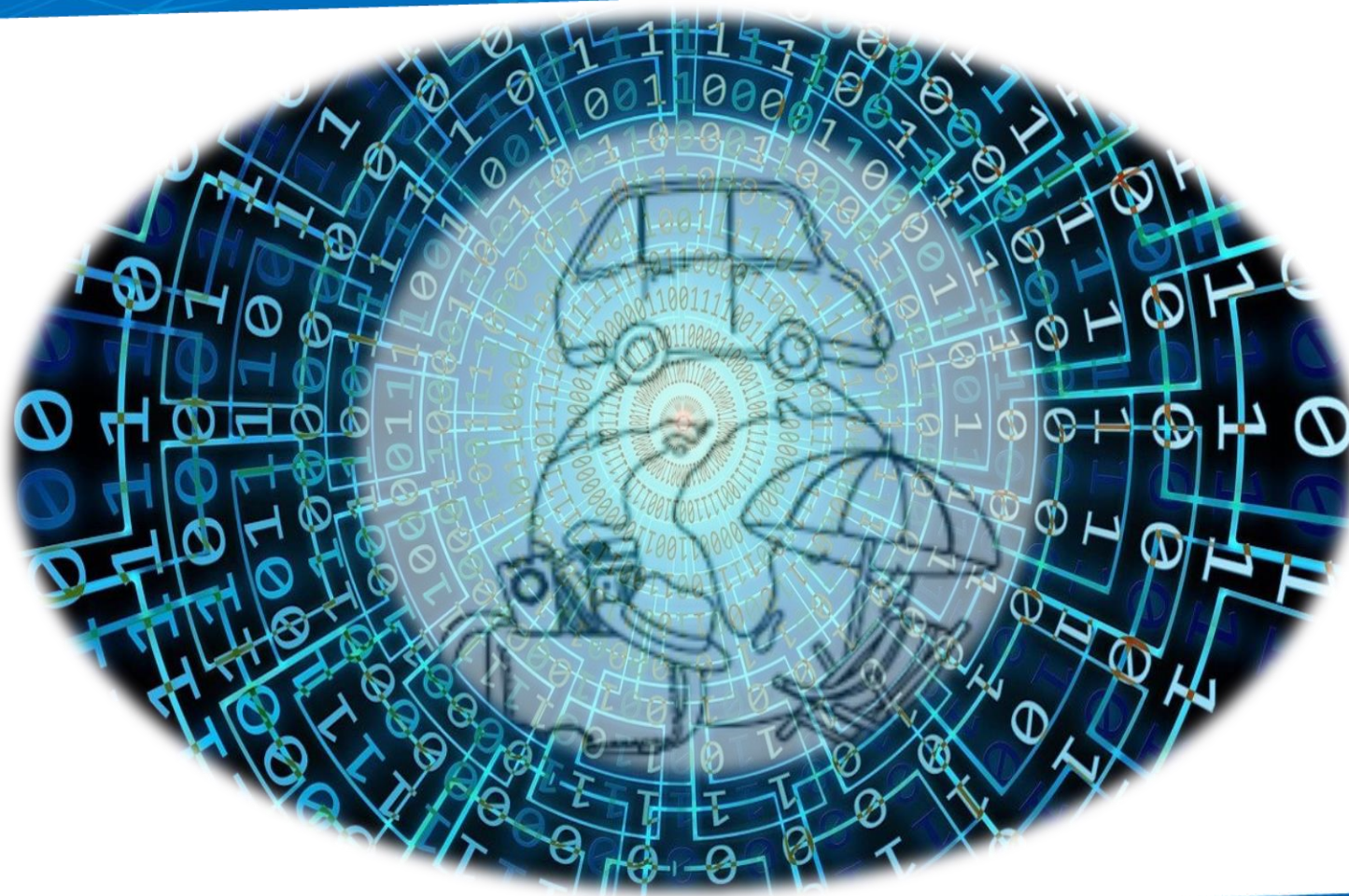


This project has received funding from the Digital Europe Programme under Grant Agreement No 101084007



Objectives of DATES and the benefits for the tourism sector

European Data Space for Tourism



Definition Data Space

Decentralised and standard-based structure to enable trustworthy data sharing between the data space participants on a voluntary basis, regulated through governance, business, legal and technical combined mechanisms Data spaces may be purpose- or sector-specific, or cross-sectoral. Common European data spaces are a subset of data spaces within the scope of EU policies.

DSSC

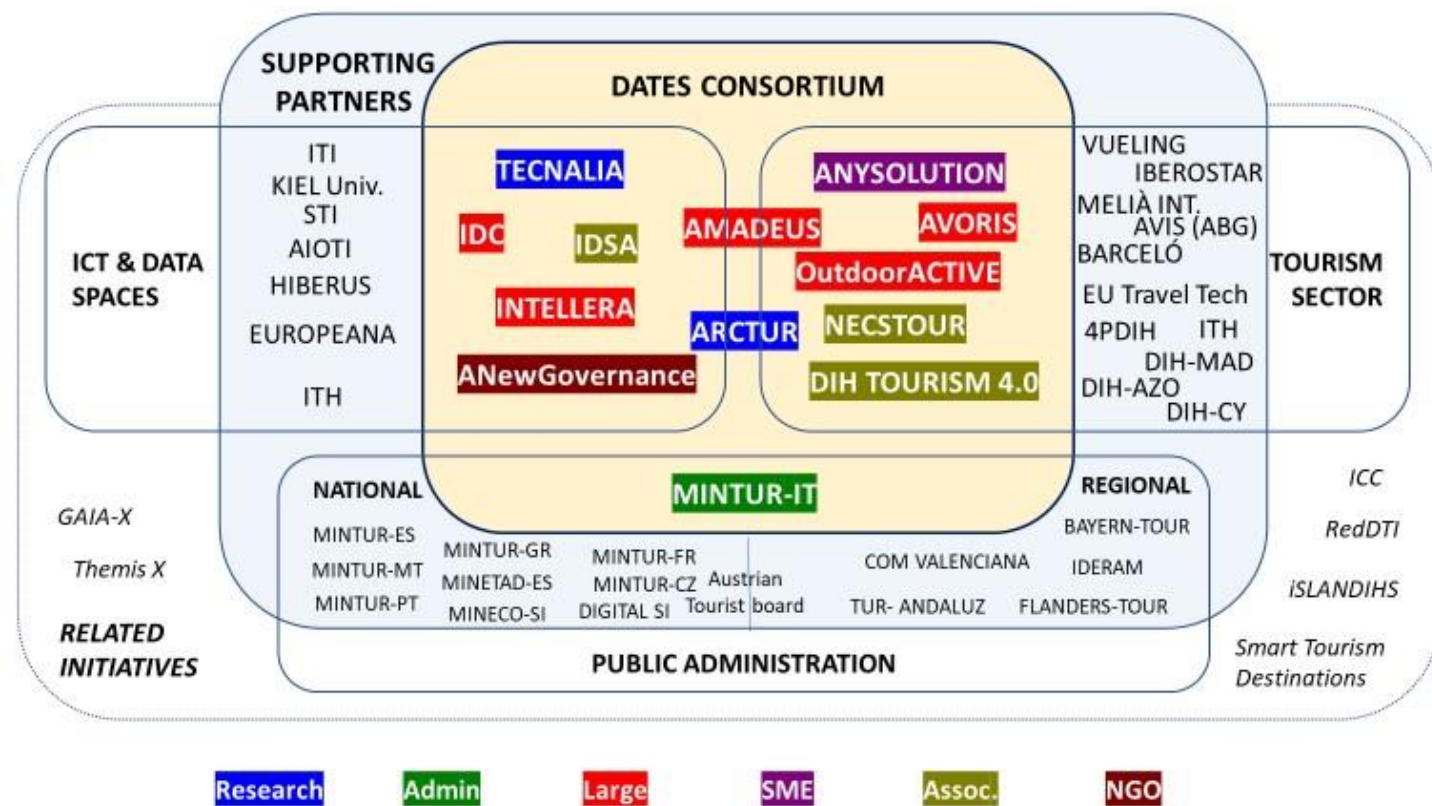
DATES

A background image showing several people's hands holding and using smartphones. The image is semi-transparent and serves as a backdrop for the text.

The **main objective of DATES** is to explore approaches and options for the deployment of a secure and trusted tourism data space, ensuring transparent control of data access, use and re-use

Key pillar: the digital transformation of the sector, fostering competitiveness, resilience, and sustainability

DATES



DATES

Create an integrated and comprehensive tourism data ecosystem managed by a **common governance**

Develop a blueprint of the **technological and non-technological** elements that will define a tourism data space

Local level
Regional level
National level
UE

Identify high-priority data sets and **define rules** for their usage

Incorporate **resilience and sustainability** as transversal pillars of the tourism data space

EUROPEAN DATA SPACE FOR TOURISM

Expectations



Support

Recommendations

Guiding



Collaboration

Ecosystem engagement

Avoiding reinventing the
wheel

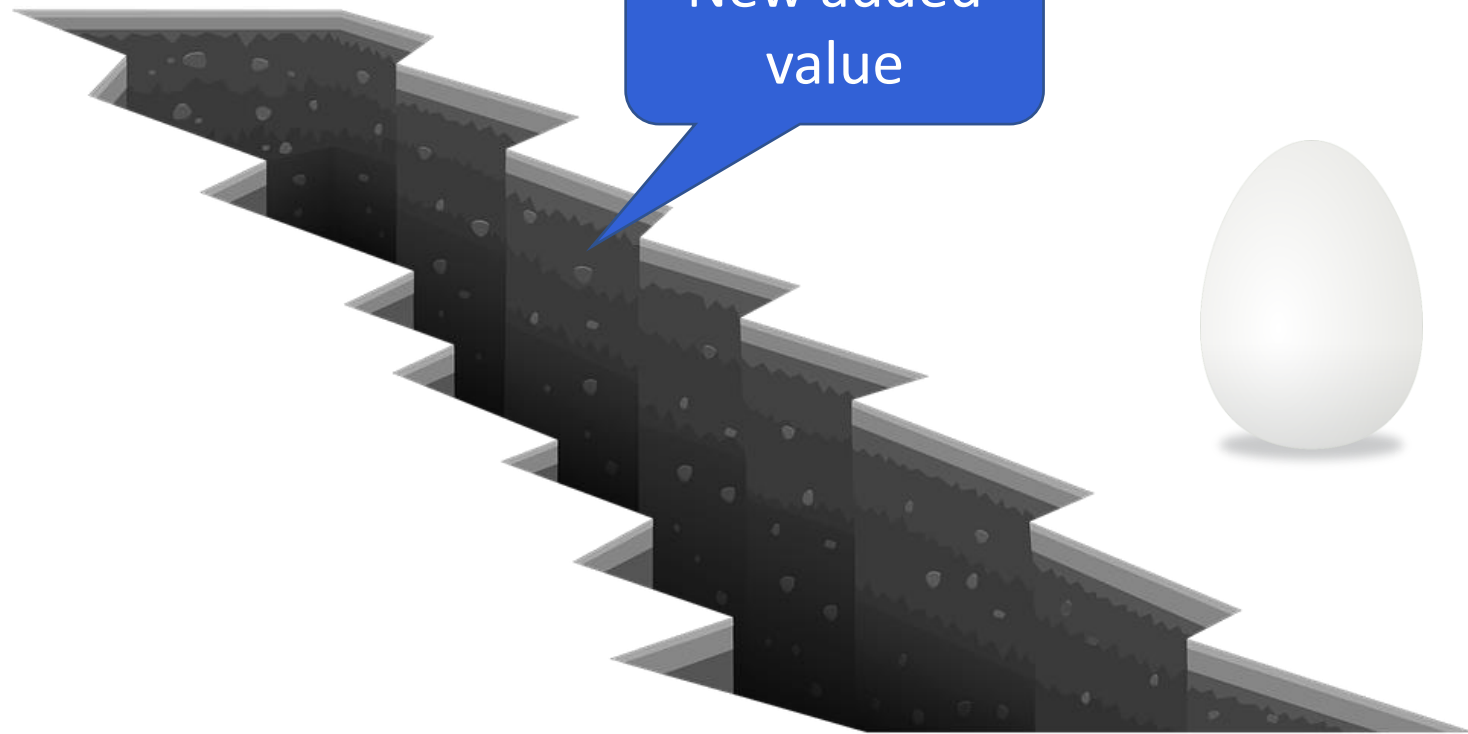
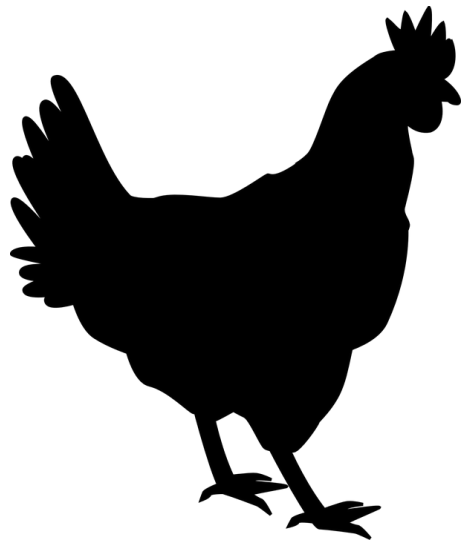


Exchange

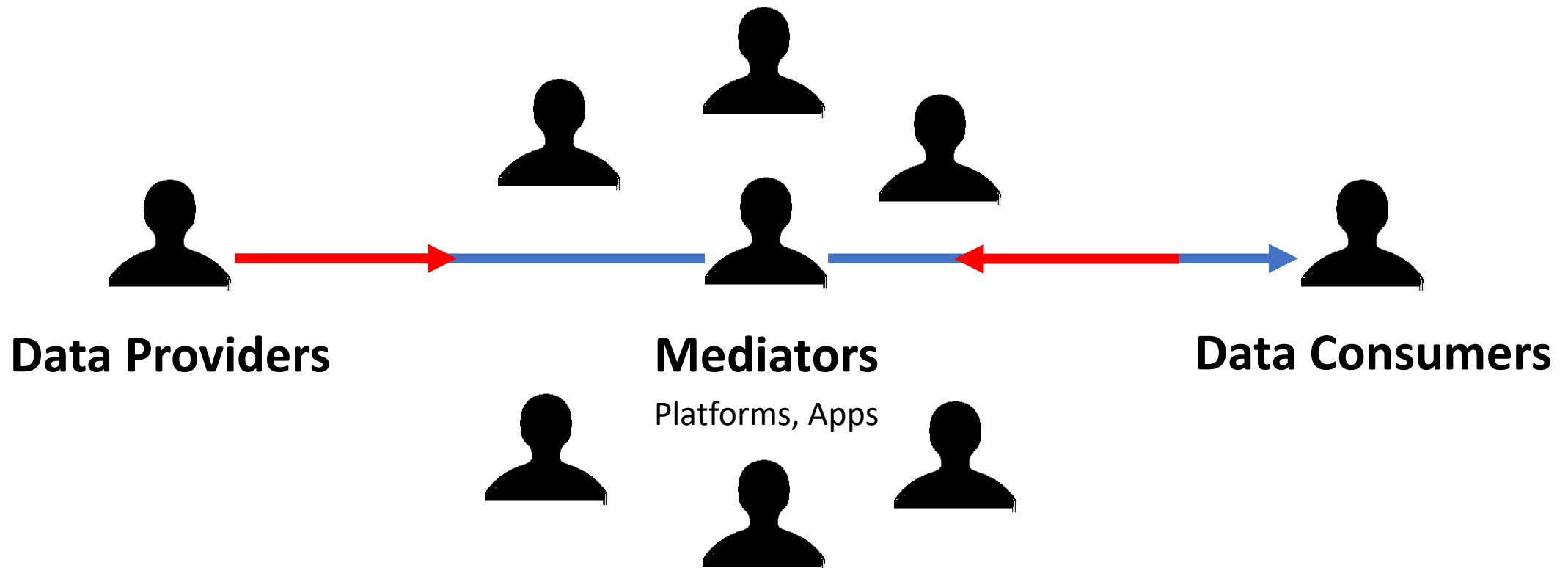
Mutual learn

Knowledge

Challenge: Connecting Data Providers and Data Consumers to reach Critical Mass



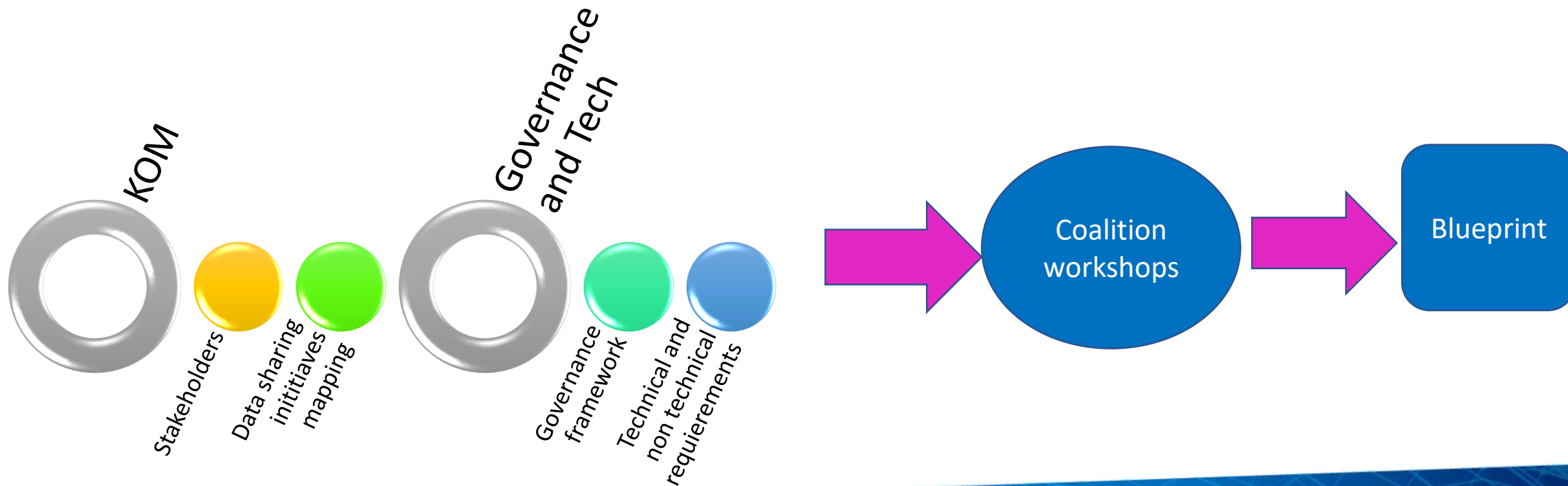
Understanding the needs of... Data Providers, Data Users and Mediators



Example Use case



ACTIVITIES



One more thing... please get involved!



To Do:

... and please my dear friends ...

...do not produce more papers and platforms but practical solutions that will solve real tourism problems

<https://www.tourismdataspace-csa.eu>



[Home](#) [Resources](#) [Events](#) [Contact](#) [Be part of DATES](#) ↓

- Survey
- Become a Stakeholder



WE'RE GOING TO SET THE BASES OF THE EUROPEAN DATA SPACE FOR TOURISM

JOIN US!!!

Dolores Ordóñez
dom@anysolution.eu



Data spaces – the policy

Árpád Welker, policy officer

DG CNECT, G2

Wednesday 8th February 2023

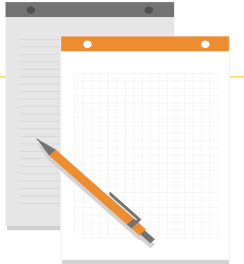
2030 DIGITAL DECADE

POLICY PROGRAMME:
A PATH TO THE DIGITAL DECADE

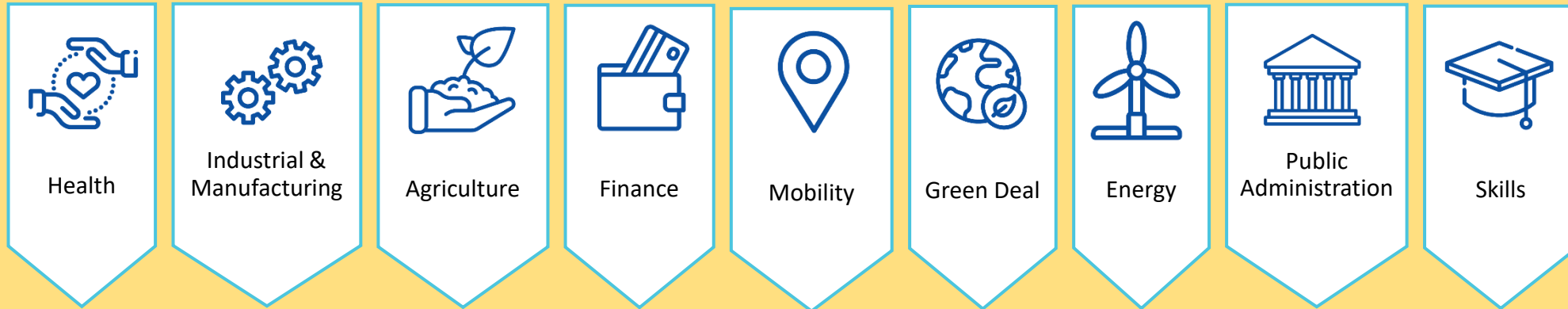
Data Space for Tourism – Policy Context

European Data Strategy initiative

- Create a single market for data
- Communication “A European strategy for data”: common and interoperable data spaces
- Staff Working Document
- Funded under the Digital Europe programme



Common European data spaces



High Value Datasets from public sector

- Driven by stakeholders
- Rich pool of data of varying degree of openness
- Sectoral data governance (contracts, licenses, access rights, usage rights)
- Technical tools for data pooling and sharing

Data Spaces Support Centre

- Coordinating the development of data spaces
- Assuring common standards and interoperability

Technical infrastructure for data spaces



Edge & cloud Services

Smart Middleware solutions

Marketplace

High-Performance Computing

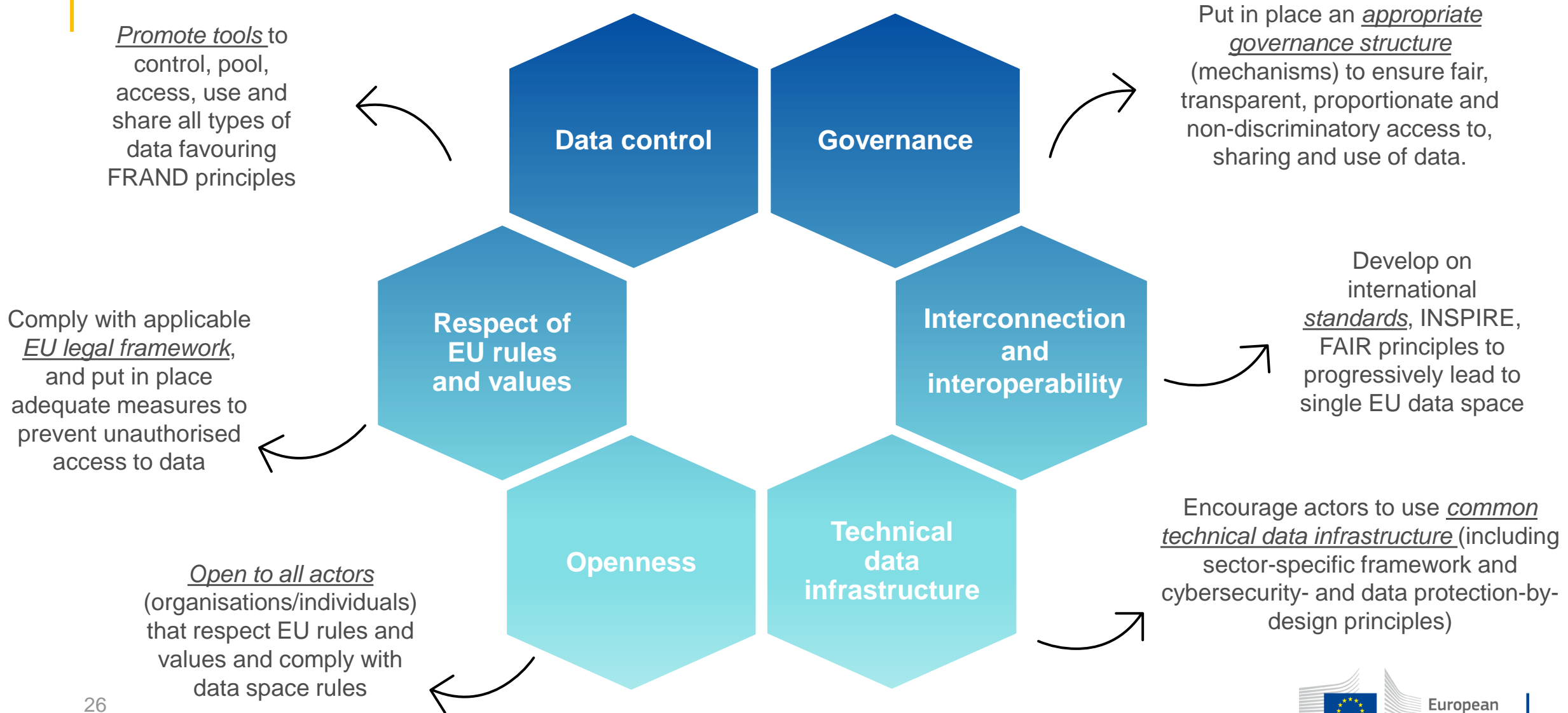
AI on demand platform

AI Testing and Experimentation Facilities

Key characteristics of a data space

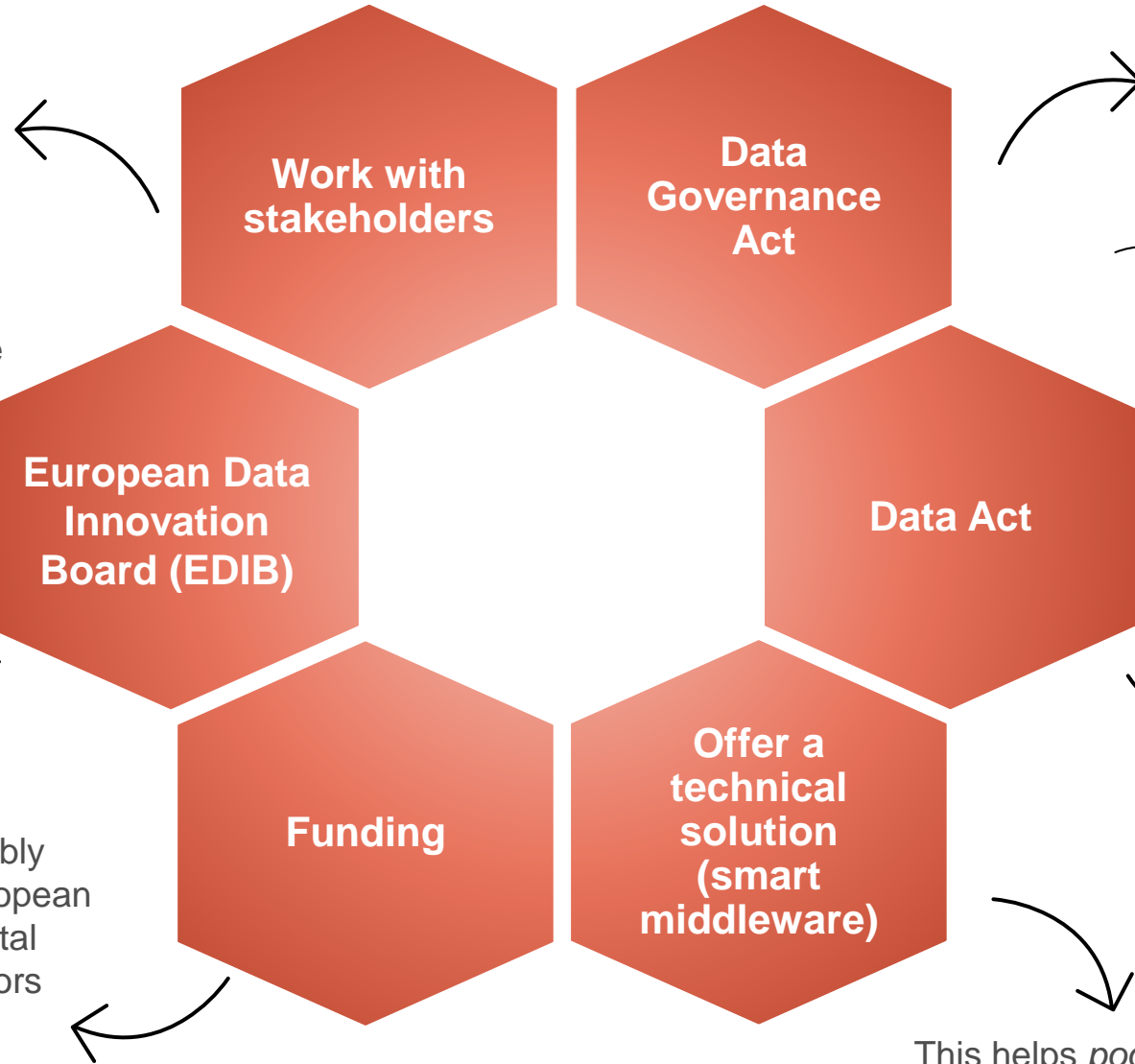
- A secure and privacy-preserving IT infrastructure to pool, access, process, use and share data.
- A data governance mechanism, comprising a set of rules of legislative, administrative and contractual nature that determine the rights to access, process, use and share data in a trustful and transparent manner.
- Data holders are in control of who can have access to their data, for which purpose and under which conditions it can be used.
- Presence of vast amounts of data that are made available on a voluntary basis and can be reused against remuneration or for free, depending on the data holder's decision.
- Participation by an open number of organisations/individuals.

Design principles for common European data spaces



The EC's role in supporting the creation of data spaces

Contribute to the *definition of objectives* for each data space and promote use of EDIB guidelines



Lays down a number principles to increase trust in *neutral data intermediaries*, i.e., the *orchestrators* of the data spaces

Ensure that companies and individuals can benefit from *international data flows*, while guaranteeing compliance with the Union's data protection and security rules

Facilitates *interoperability* of data, data sharing mechanisms and services (incl. data spaces) between sectors

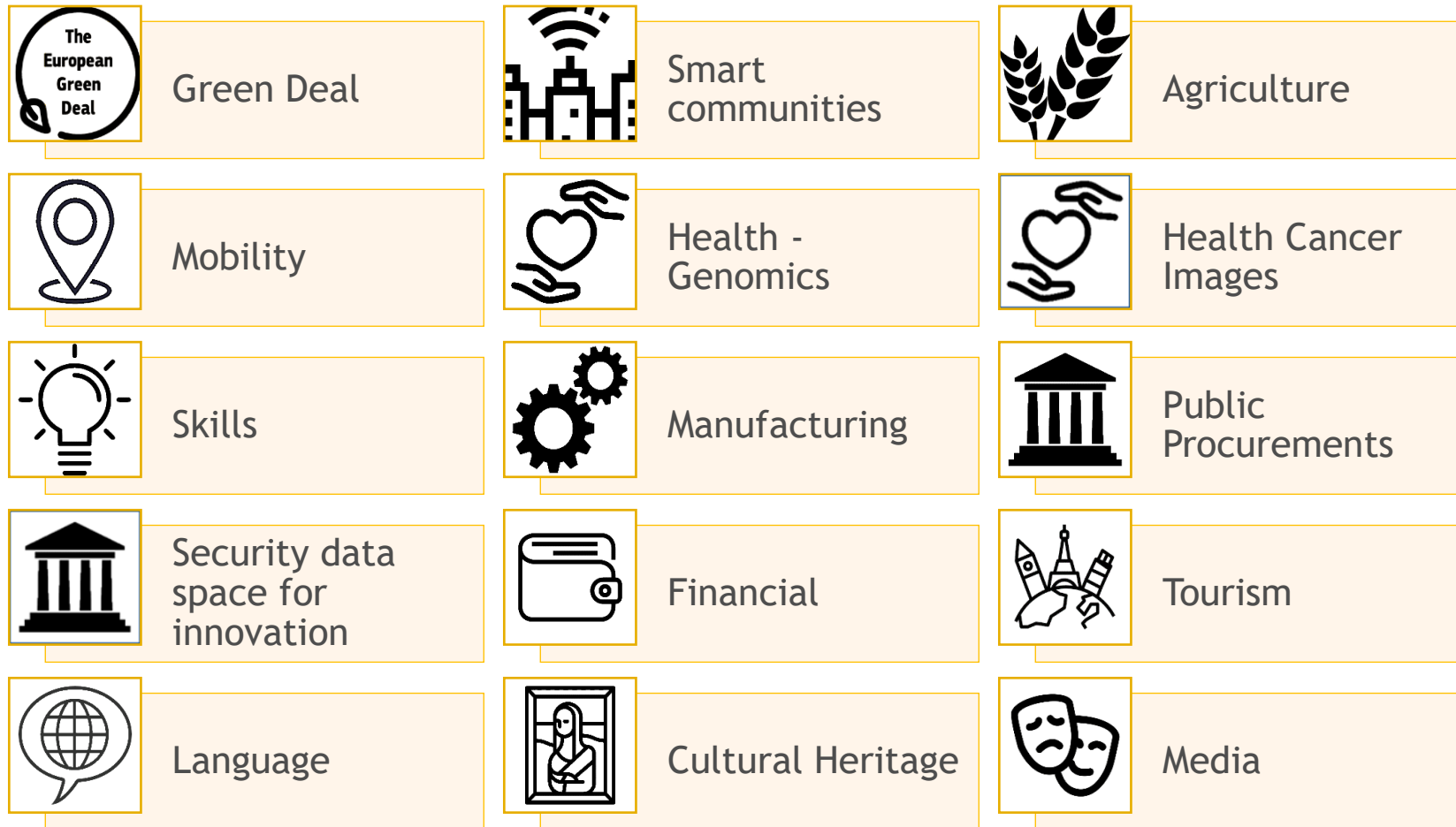
This helps *pool existing data infrastructures* (cloud federation)

EU financial contribution (notably DIGITAL) to deploy common European data spaces as European digital infrastructures in specific sectors

Support the Commission in:

- *Issuing guidelines* to facilitate the development of the common European data spaces
- Identifying the relevant standards and interoperability requirements for *cross-sector data sharing*

Common European data spaces supported through DIGITAL



Thank you



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Slide xx: **element concerned**, source: [e.g. Fotolia.com](https://www.fotolia.com/); Slide xx: **element concerned**, source: [e.g. iStock.com](https://www.istock.com/)



EONA-X

The dataspace for Mobility, Tourism & Transport

Jean-François Cases – President – EONA X

EONA-X Mobility, Tourism & Transport Data Space

Improve the tourism and the multimodal mobility / transport experience in Europe
Facilitate the data exchange among actors of the industry
Provide safety, sustainability, comfort, resilience, accessibility, efficiency, fun



Current
partners



AMADEUS



Renault
Group

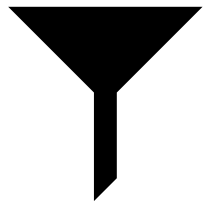
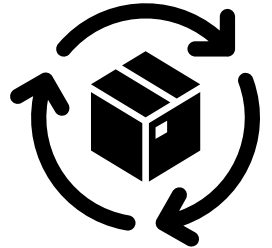
Business Model

- _ Non profit Organisation
- _ Members in the Mobility, Tourism and Transport industries
- _ Financed by internal funding and looking for European and National funding

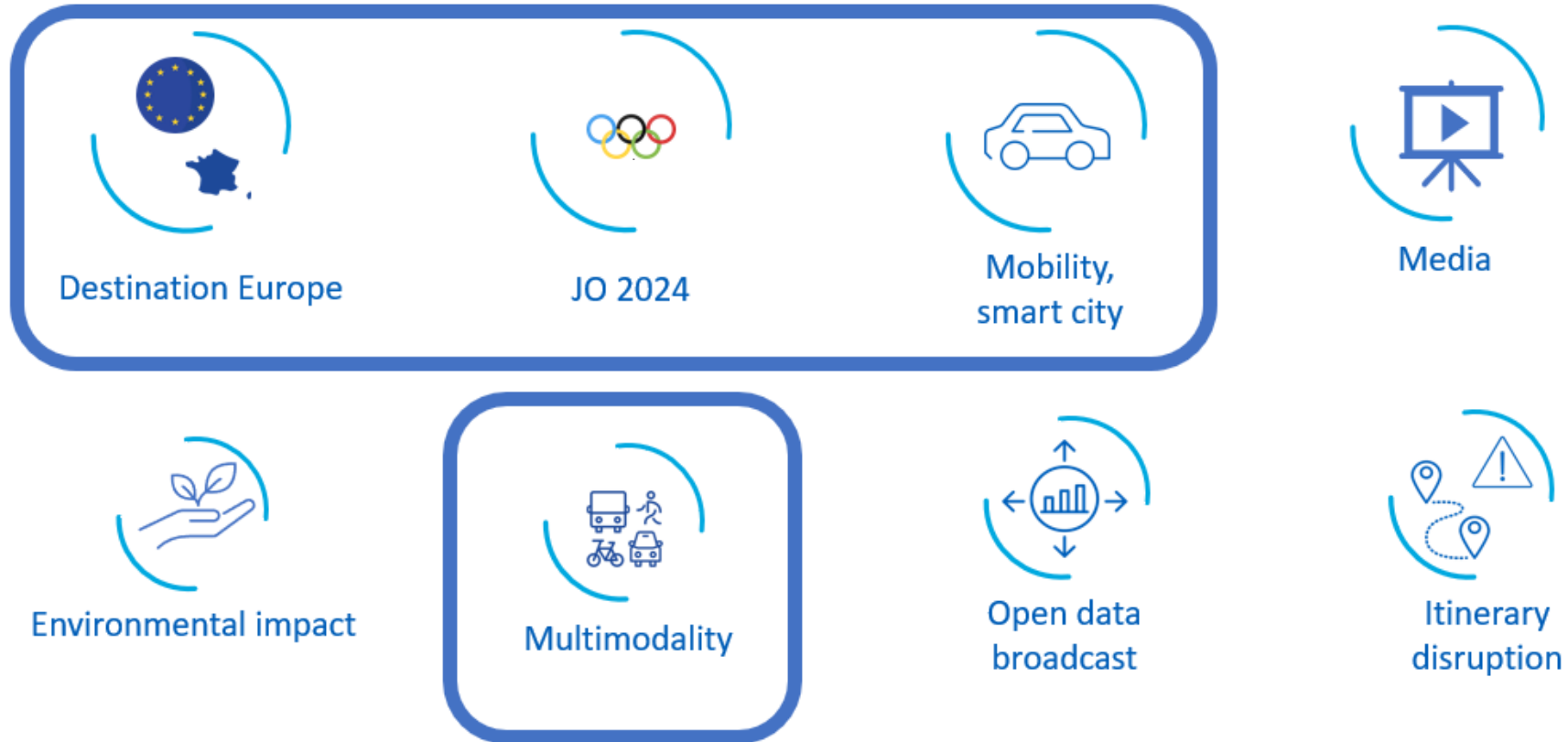


Main activities

- Contribute to EU Data Space program and explore opportunities on how to **unlock data value** in the tourism and mobility area
- Explore opportunities by implementing **use cases incl. applications** which have the potential to generate value.
- Use cases are the core of the efforts of EONA-X, need full support and engagement at Strategic / Management / Financial level
- Identify and prepare use cases for their realization



Use cases under work



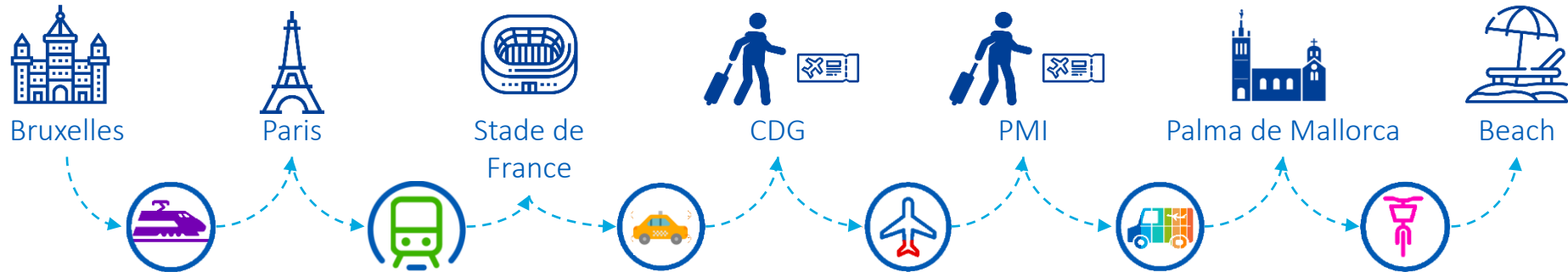
Multimodal Use Case selected as showcase of the feasibility

Initial problem

- Usually, **transport is multi-segment**, involving several means of transportations and different stakeholders making it difficult to adapt to disruption
- **Each segment has its own rules, tickets**, sources and channels of information

User story

- The traveler is planning to **go to Palma from Brussels going through Paris** to watch a match at the Stade de France
- The journey can be summarized as follows:



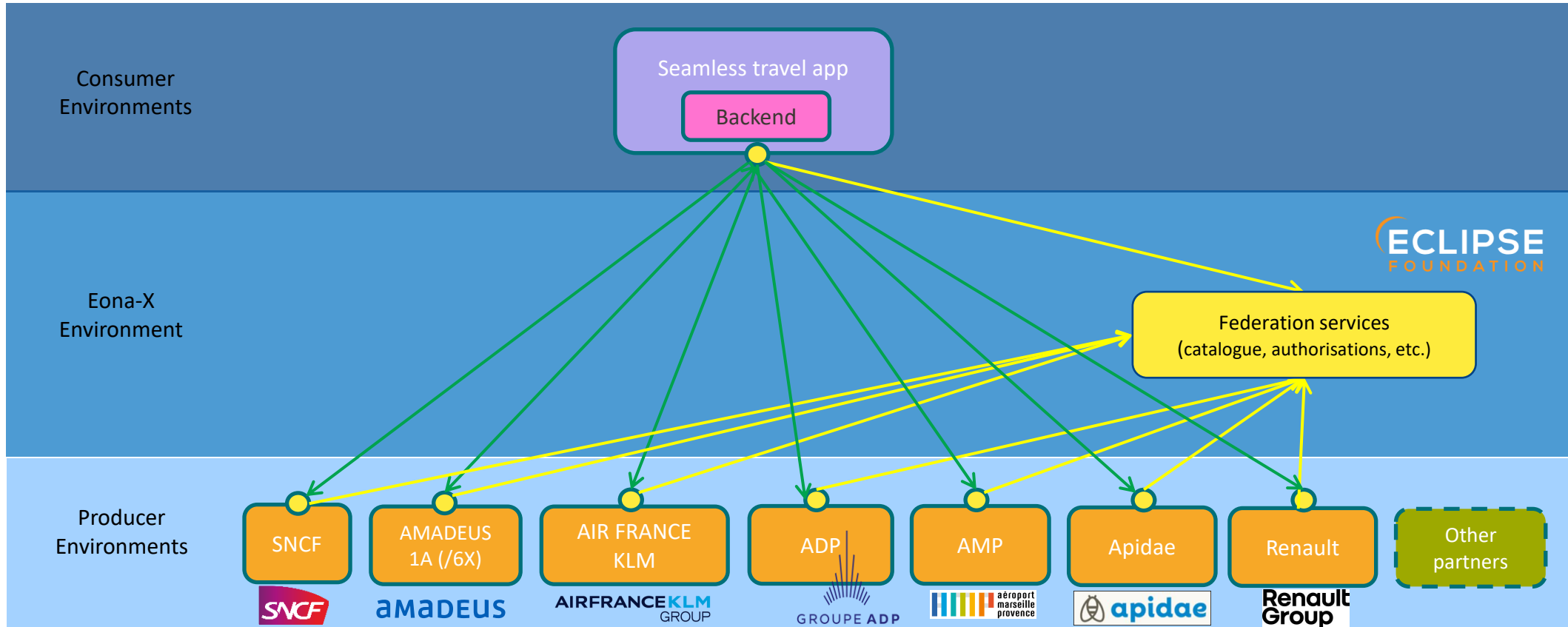
- The traveler used the platform that contains **everything necessary to plan a trip à la carte**: possible ways of transportation for each leg, schedules, connections, prices, bookings and so on.
- Once added to her trip, she receives **real-time updates** and notifications on the corresponding **mobile app**, his digital assistant during the trip. This app works like a **safe-box in which all tickets and travel documents are stored**.

First MVP perimeter

- As a traveler, I can manually create a trip by adding flights, trains and buses to my “**travel book**”
- For each ways of transportation, I entered I **see the schedules, details and receive real-time updates**.
- **Direct advantage**: the stakeholders share schedules under a common format



Multimodality Use Case – Eona-X demonstrator



● Dataspace Connector (Eclipse Dataspace Connector is Open Source Software)

→ Federation services

→ Data exchange



EONA-X data catalogue



Asset card for ADP Terminals. It features the GROUPE ADP logo at the top, the title 'ADP Terminals' in the center, and an API icon at the bottom. The card is highlighted with a green border.

Asset card for ADP Transit information. It features the GROUPE ADP logo at the top, the title 'ADP Transit information' in the center, and an API icon at the bottom. The card is highlighted with a green border.

Asset card for AFKL Flight Schedules. It features the AIRFRANCEKLM GROUP logo at the top, the title 'AFKL Flight Schedules' in the center, and an API icon at the bottom.

Asset card for Amadeus 6X PNR. It features the amadeus logo at the top, the title '6X PNR' in the center, and a money bag icon at the bottom. The card is highlighted with a green border.

Asset card for Amadeus 6X Flight Schedules. It features the amadeus logo at the top, the title '6X Flight Schedules' in the center, and a cluster of circles icon at the bottom. The card is highlighted with a green border.

Asset card for AMP Arrival Info. It features the aéroport marseille provence logo at the top, the title 'AMP Arrival Info' in the center, and an API icon at the bottom.

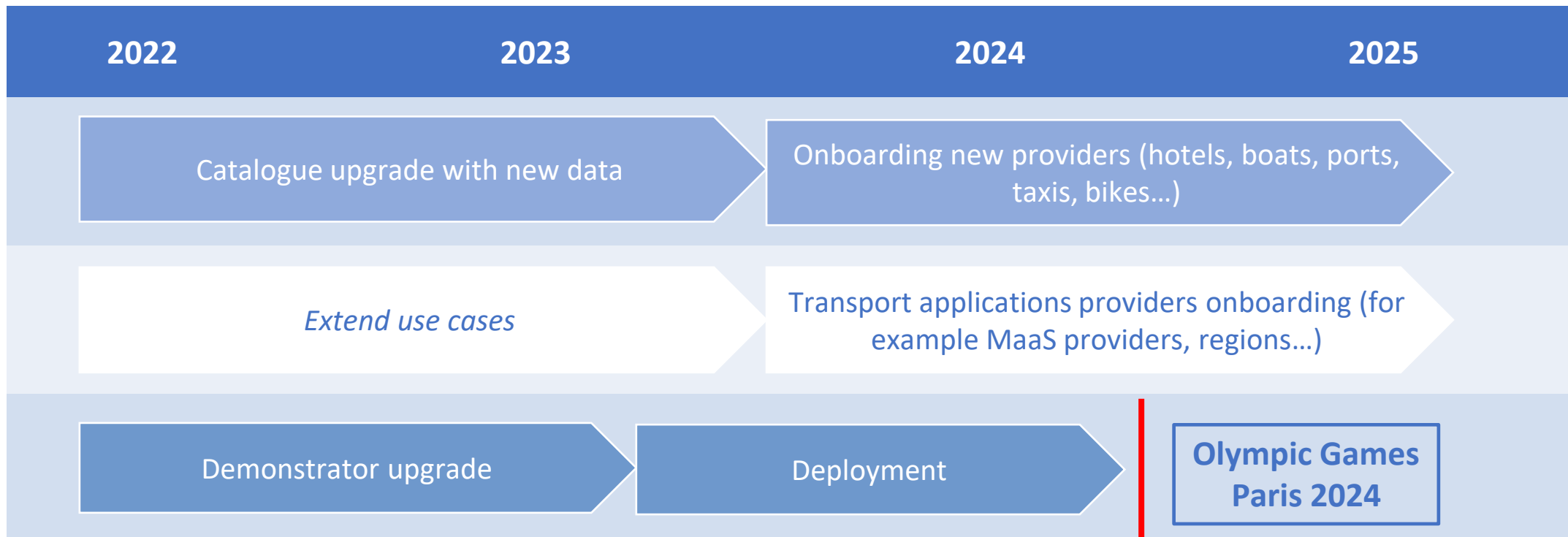
Asset card for apidae Tourism information. It features the apidae logo at the top, the title 'Tourism information' in the center, and an API icon at the bottom.

Asset card for Renault Group Renault dealers locator. It features the Renault Group logo at the top, the title 'Renault dealers locator' in the center, and an API icon at the bottom.

Asset card for SNCF Train Schedules. It features the SNCF logo at the top, the title 'SNCF Train Schedules' in the center, and an API icon at the bottom.



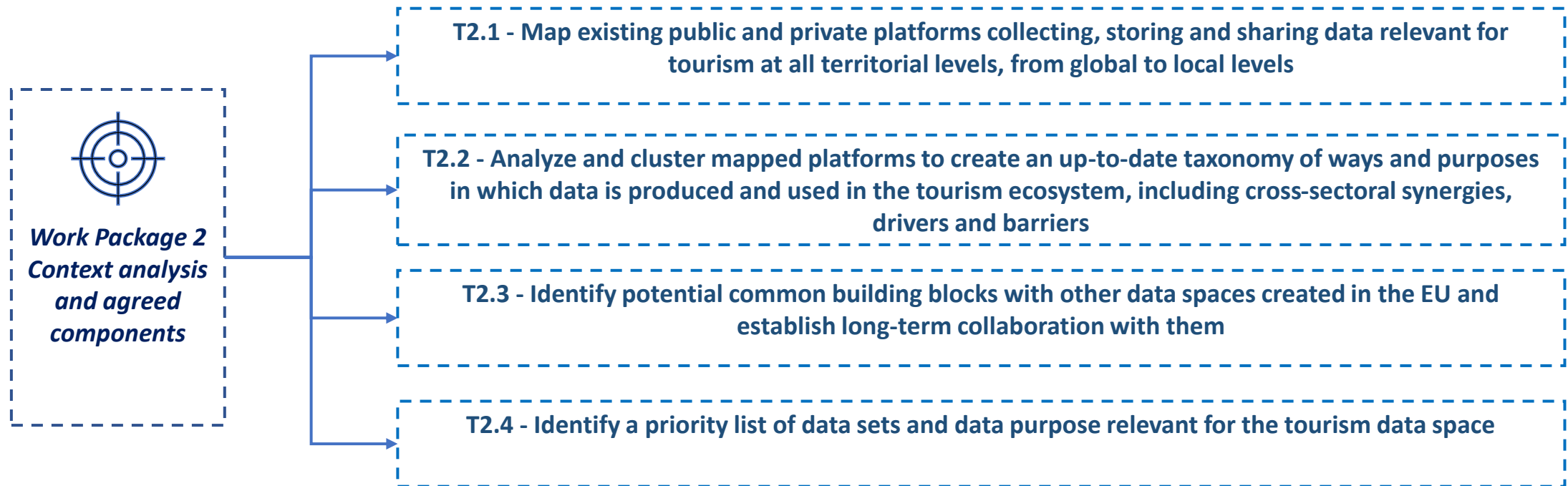
Conclusion



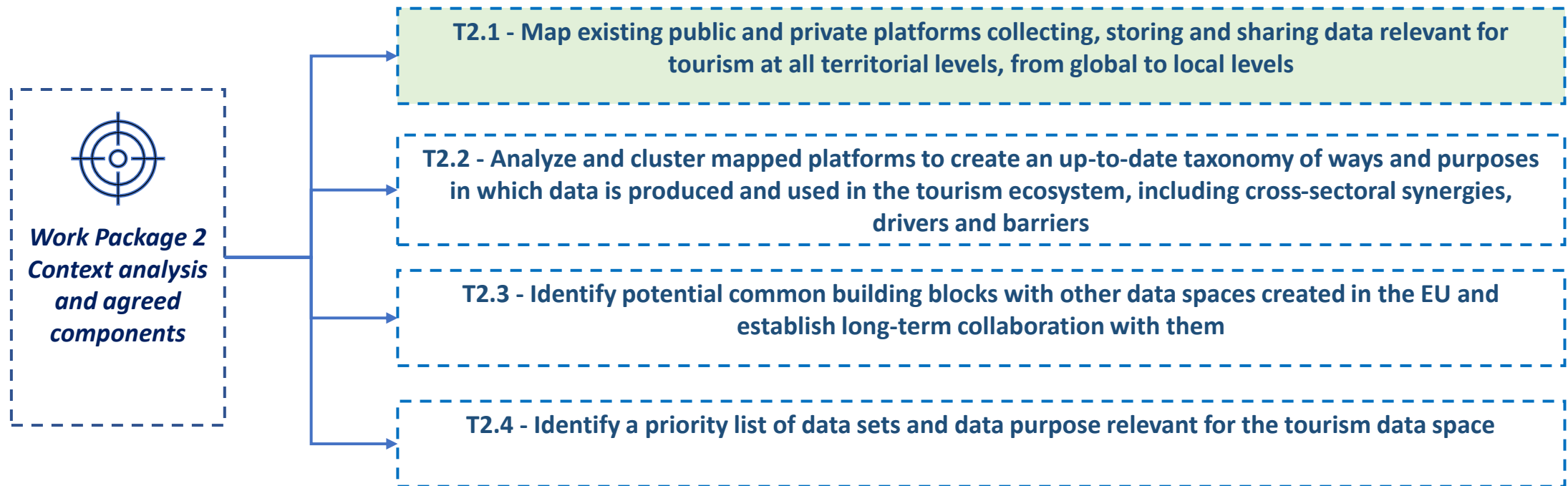
FIRST RESULTS

Marco Codastefano - Manager Intellera Consulting

Methodology Overview



Methodology Overview



Methodology overview

Desk research

Desk research activities allowed to identify an initial **list of data sharing initiatives**.

The desk research has been carried out using a **mix of relevant sources**.

To ensure that the mapping is able to cover as many initiatives as possible, all **partners have been assigned to a geographical area**.

Survey

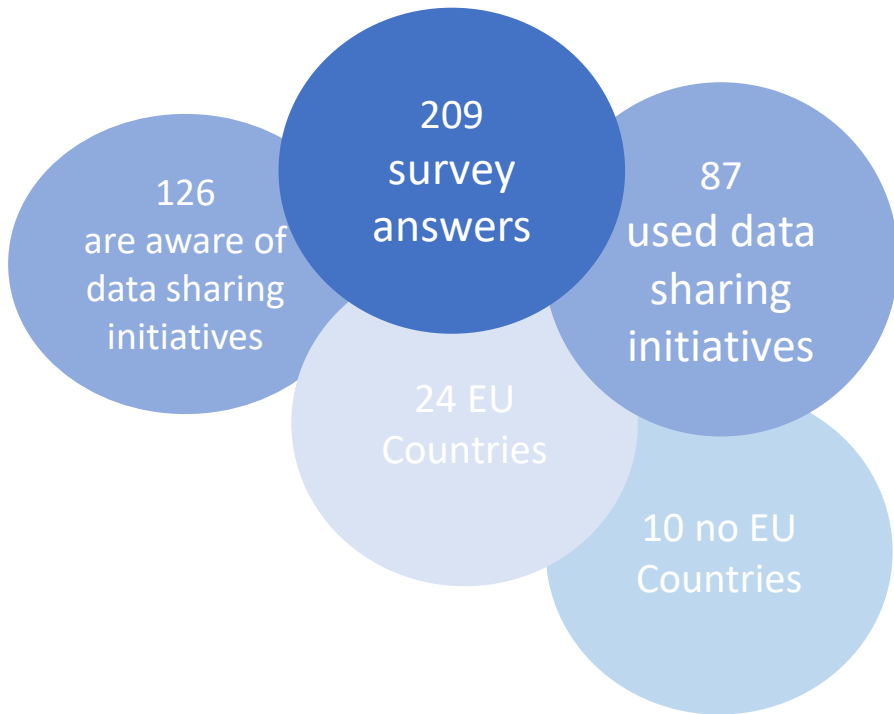
The **survey** complemented the results of the desk research.

Its aim was twofold: (i) **gaining insights on relevant data sharing initiatives** that could have been missed during the desk research activities and (ii) **exploring which are the challenges** in the tourism sector.

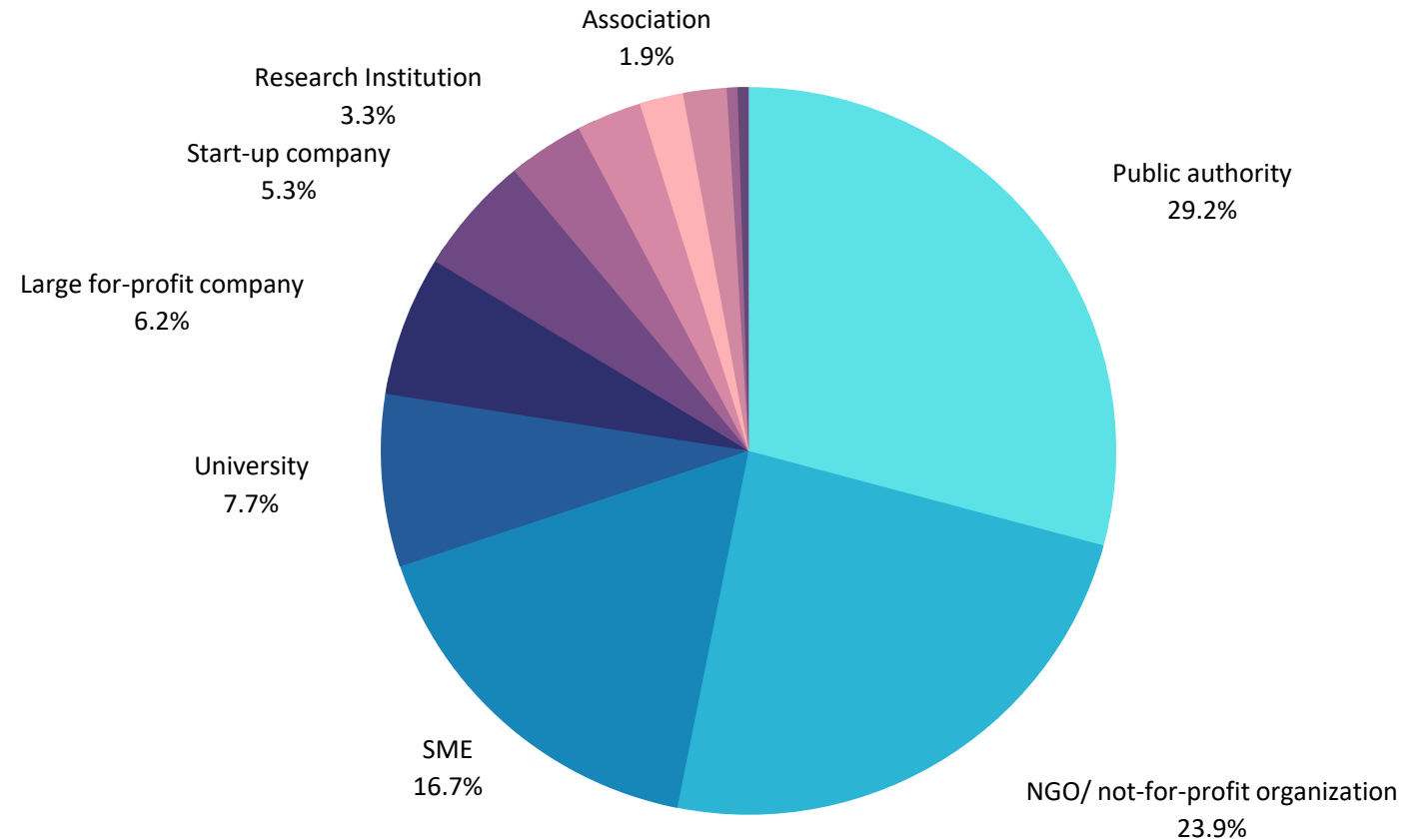
The **answers to questions** regarding which data are needed in the tourism sector are used as **preliminary knowledge** that would inform today's workshop.

Overview - Survey

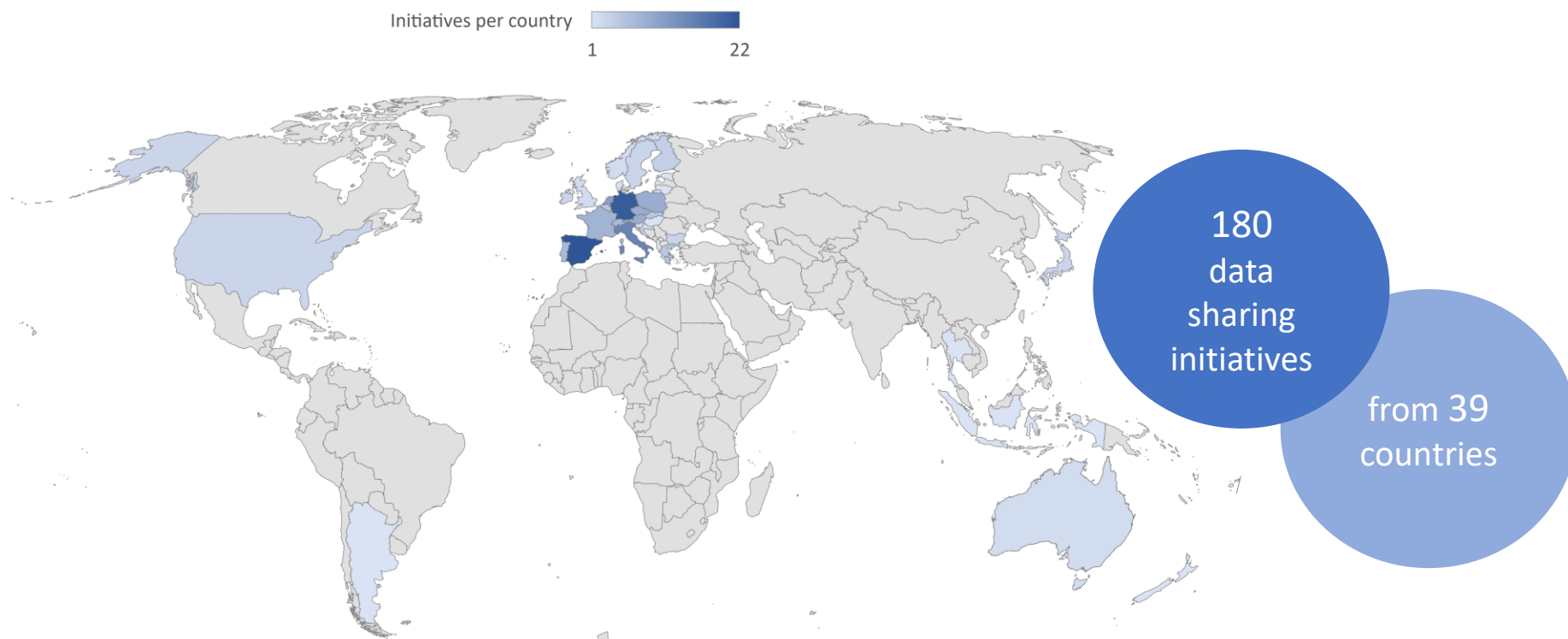
Some facts on respondents...



Typology of organization of respondents



Overview - Inventory



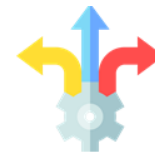
Initial findings – Data purpose

What are the purposes of making use of data for tourism?



Improve interaction and engagement with the tourist

Development of **tourism services increasingly personalised and based on a higher degree of interaction** with the customer/end-user.



Improve planning and operations of tourism services

Understanding (and possibly predicting) tourism patterns through data can help to **improve the overall efficiency and competitiveness of the tourism ecosystem.**



Conduct market analyses and inform decision-making

Higher availability of data and improved data analytics capabilities allow **improvements in market analysis and decision-making.**



Increase tourism sustainability and accessibility

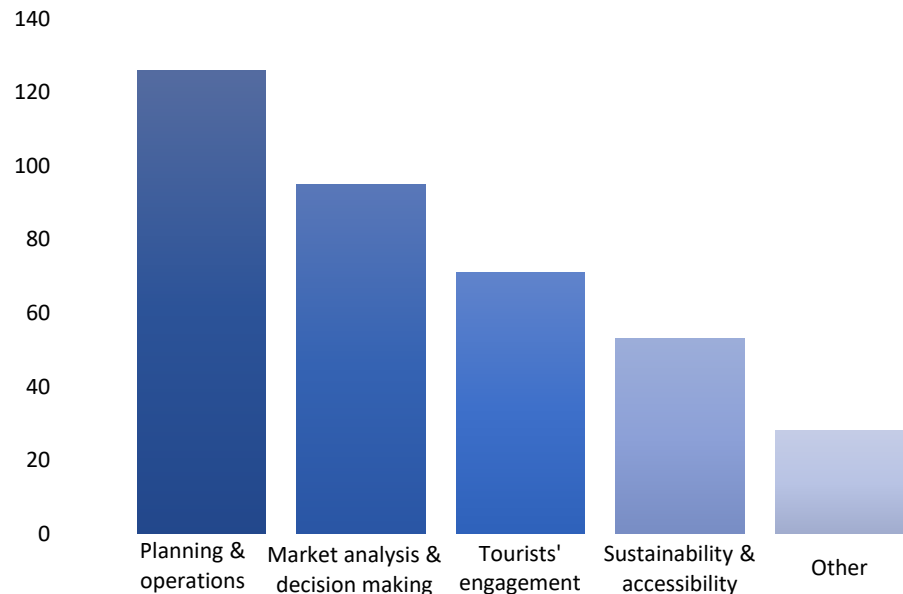
Enhanced analysis and management of data can improve the destinations sustainability and accessibility producing **positive impacts on society at large.**

European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Galasso, G., Montino, C., Sidoti, A., et al., *Study on mastering data for tourism by EU destinations : main text*, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2873/23880>

Initial findings – Data purpose

Inventory

Distribution of data purposes



Survey

Most important data purposes

1. **Conduct market analysis and inform decision-making**, thanks to a higher availability of data and improved data analytics capability,
2. **Improve planning and operations of tourism services**, facilitated by the understanding of tourism patterns through data.

Rank of data purposes available

- 1 Conduct market analysis & inform decision-making
- 2 Improvement of planning and operations of tourism services
- 3 Increase of tourism sustainability and accessibility
- 4 Improvement of the interaction and engagement of the tourist
- 5 Other

Initial findings – Data sources



User generated data

User-generated content (UGC) is data produced and made available by tourists themselves. UGC can be divided into two main sub-categories: **textual information** (such as reviews, posts, etc.) and **photos** (usually uploaded on social media, including additional information, such as locations, time and tags).

Photo

Textual

01

02

Web search and webpage visiting

Online booking and purchasing

Consumer card transactions

Transaction data

The rise in **cashless payment solutions** – from shops to public transports, accommodation and tourism sites – generates **massive amount of tourism-related commercial data**. Such data is generated **anytime a transaction is performed**, including in **the pre-visit phase**.



Device data

GPS, mobile roaming, RFID, bluetooth, meteorological, Wi-Fi

Smart city (pollution, traffic, waste, etc.)

03

04

Business information

Statistics

Context specific information

Device data can be divided in data collected by devices and sensors that allow the **tracking of movements**, and data collected by **smart city/data initiative devices and sensors**.

Other data

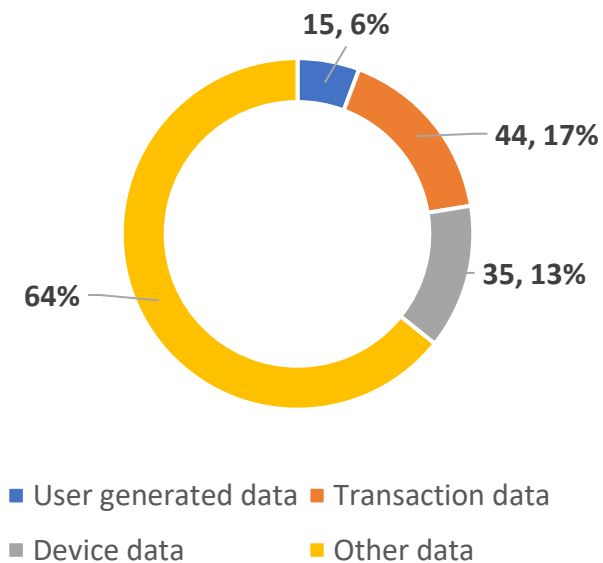
High value data can also come from other sources, including **private businesses datasets** (e.g., data on the number of passengers held by airlines), **statistics** (such as datasets published by public authorities), and **context-specific information** (e.g., the information on the history of a place, which can be used to develop a virtual reality experience).



Initial findings – Data sources

Inventory

What are the most used data sources?

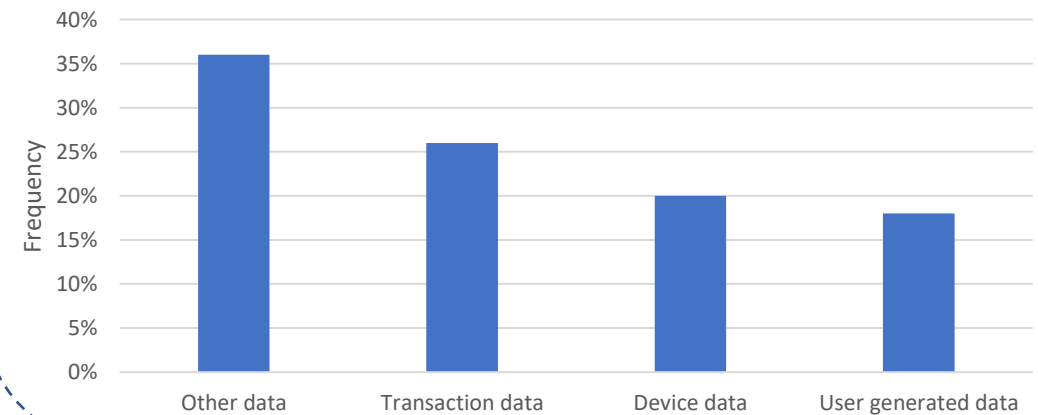


Survey

Rank of most important data

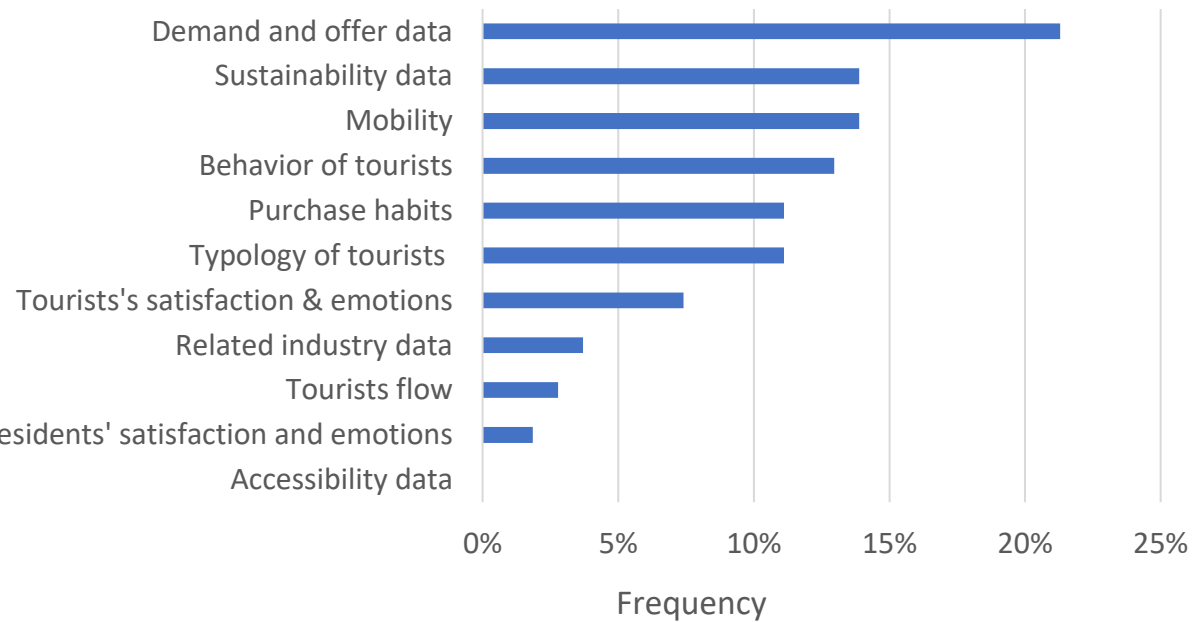
- 1 Transaction data
- 2 User-generated data
- 3 Device data
- 4 Other data

Frequency of data sources in data sharing initiatives



Main gaps – Data information & characteristics

Data information not yet been addressed



Shortages in terms of data characteristics

1. **Incomplete data**
2. Not widely spread **open data**
3. **Low quality and granularity** of data
4. **Data interoperability**
5. Lack of **coordination/cooperation**
6. Lack of **users' skills/awareness** regarding data

BREAK OUT ROOMS

Danilo Bianchini – Manager – Intellera Consulting

Break out rooms

1 – Sustainability & accessibility

Facilitator:

*Italian Ministry of
Tourism*
Tatiana Semanova
Adele Pia

2 – Market analysis & decision-making

Facilitator:

Anysolution
Dolores Ordóñez

3 – Tourists' engagement

Facilitator:

Intellera Consulting
Danilo Bianchini

4 – Planning & Operations

Facilitator:

Intellera Consulting
Marco Codastefano

Break out room set up

1

Check the email sent
yesterday!

You will find a link for the
assigned breakout room

2

Join the breakout room!

After joining, take a break
and the section II will start
at 11:10