European Commission

Study on Mastering data for tourism by EU destinations

Methodological Appendix

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Table of Contents

1. Introduction

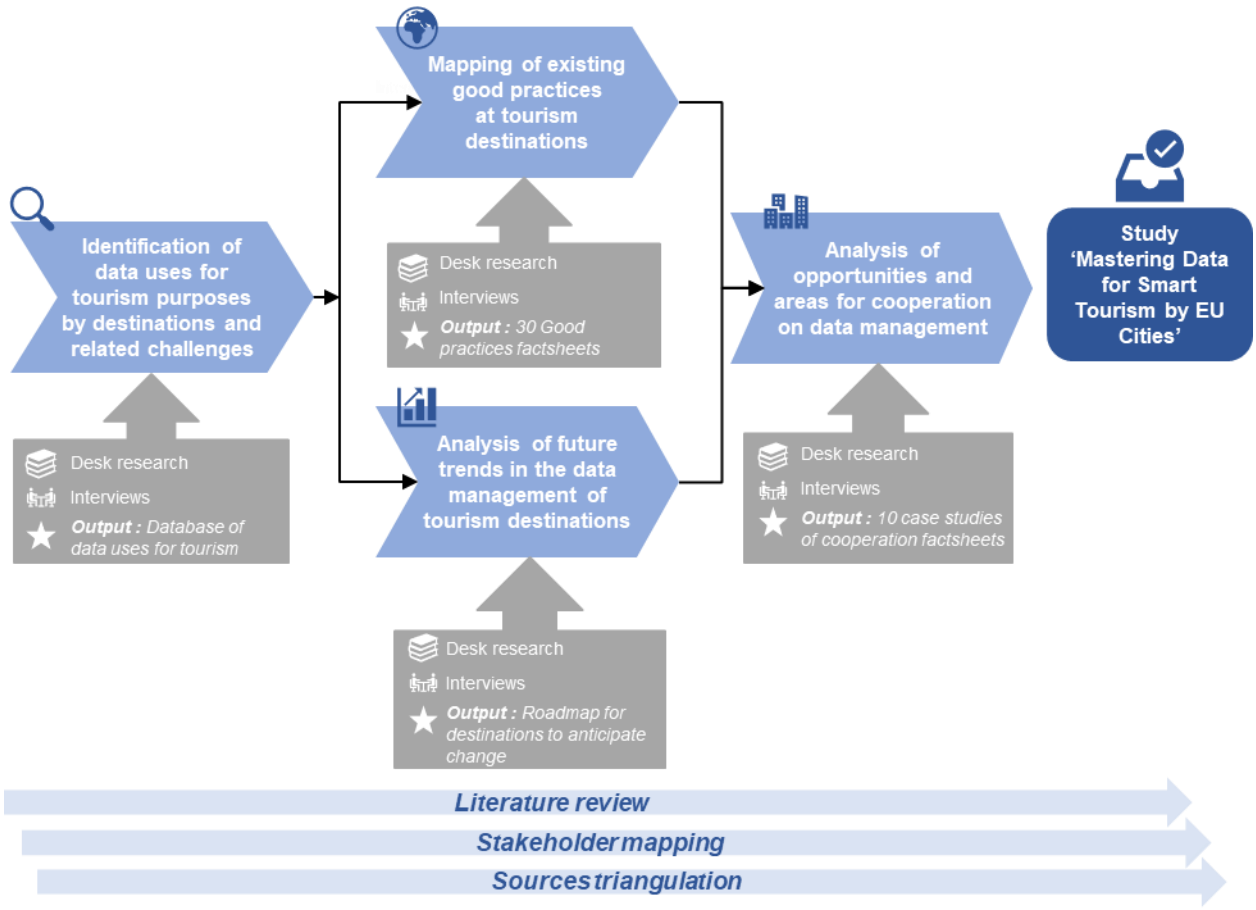
This document serves as methodological appendix to the 'Study on Mastering data for tourism' drafted in the context of the project 'Smart Tourism Destinations' conducted on behalf of the European Commission - DG GROW. The document describes the different approaches and techniques adopted by the study team in order to develop the different sections of the study.

1.1. Overview of the methodology

Starting from extensive literature review and supported by rounds of interviews with tourism experts, the study team completed the mapping of the current state of smart tourism across European destinaitons, identifying challenges, trends and virtuous examples.

The following scheme provides a visual overview of the methodology followed to draft the different section of the study:

Table 1 – Overview of study methodology



Source: Author's elaboration

1.2. Structure of the document

The document is structured as follows:

- **Section 2** describes the approach adopted for mapping relevant stakeholders in the different phases of the study, in order to identify key actors of the tourism ecosystem and potential interviewees.
- **Section 3** provides an overview of the many techniques used to gather and review a large number of sources that represented the main knowledge base for the study.
- **Section 4** describes the steps followed by the study team to collect and analyse data uses for tourism.
- **Section 5** includes the methodology adopted to develop a compendium of 30 smart tourism good practices.
- **Section 6** describes the approach followed by the study team to identify and analyse future trends which will impact the tourism sector in the short, medium and long run.
- **Section 7** describes the activities conducted to analyse opportunites and areas for stronger cooperation among tourism destinations, which included the identification and in-depth analysis of 10 cases of cooperation in the field of tourism data sharing/managament.

2. Stakeholder mapping

One of the very first activities conducted by the project team was an extensive mapping of stakeholders to be consulted and engaged. Having a strong knowledge about the stakeholders was considered key prior to undertake any initiative not only related to this study, but also in connection to any other activity scheduled by the project workplan.

Key stakeholder engagement and consultation has been consistently performed throughout the study, to gather useful insights, validate preliminary findings, identify new sources and further relevant stakeholders. To this end, an iterative approach to stakeholder mapping was adopted which allowed to progressively expand the list of mapped stakeholders, covering all the main areas of operation and expertise related to smart tourism.

Firstly, the study team mapped the most relevant stakeholders emerging from both academic and grey literature in the field of tourism management and, more specifically, data management for tourism. As mentioned above, this preliminary mapping was extended through interviews and other activities – such as participation in relevant events – conducted on a rolling basis during the project, following a snowball approach.

The stakeholders mapped were mostly those with relevant knowledge and experience in the area of tourism data management and related technologies, including individuals with current or recent responsibilities in tourism destinations management. The following table lists the information gathered by the study team when mapping each stakeholder identified:

Table 2 – Fields of the Stakeholder map

Field Name	Description
ID	*[#1; #2; #3;…; etc.]*
First name	*[First name(s)]*
Last name	*[Last name(s)]*
Job title	Position held in the primary organisation of affiliation *[e.g. Director, CEO, Coordinator, Head of Department,… etc.]*
Organisation name	Commercial or institutional name of the organisation of affiliation

Stakeholder type and subtype	• Academic experts
	  ○ Tourism
	  ○ Data management
	• International organisations
	• Industry associations
	• Networks and initiatives
	• Policy-makers
	  ○ EU
	  ○ National
	  ○ Regional/Local level
	• Industry operator
	  ○ Tourism
	  ○ Data management
	• Destination Management Organisation (DMO)
	  ○ EU
	  ○ National
	  ○ Regional/Local level

Country	Country of nationality

E-mail	Stakeholder's email address
Telephone	Contact phone number(s)
LinkedIn profile	Link redirecting to stakeholder's LinkedIn profile
Twitter profile	Link redirecting to stakeholder's Twitter profile
Organisation website	URL of the stakeholder's main organisation
Contact source availability	Publicly available, private/non-public, etc.
Comments	Contact source, relevant information concerning the stakeholder, etc.
Additional information	Presentations, documents, URLs to take into consideration, etc.

To date, a total of 334 stakeholders – clustered around 8 main types – were mapped according to:

- 2 categories of expertise:
  - Tourism
  - Data Management
- 3 levels of geographical scope
  - EU level
  - National level
  - Sub-national level (Regional, Local, etc.)

In line with the above, the following table provides an overview of the distribution of the stakeholder types mapped, across the different expertise categories and geographies:

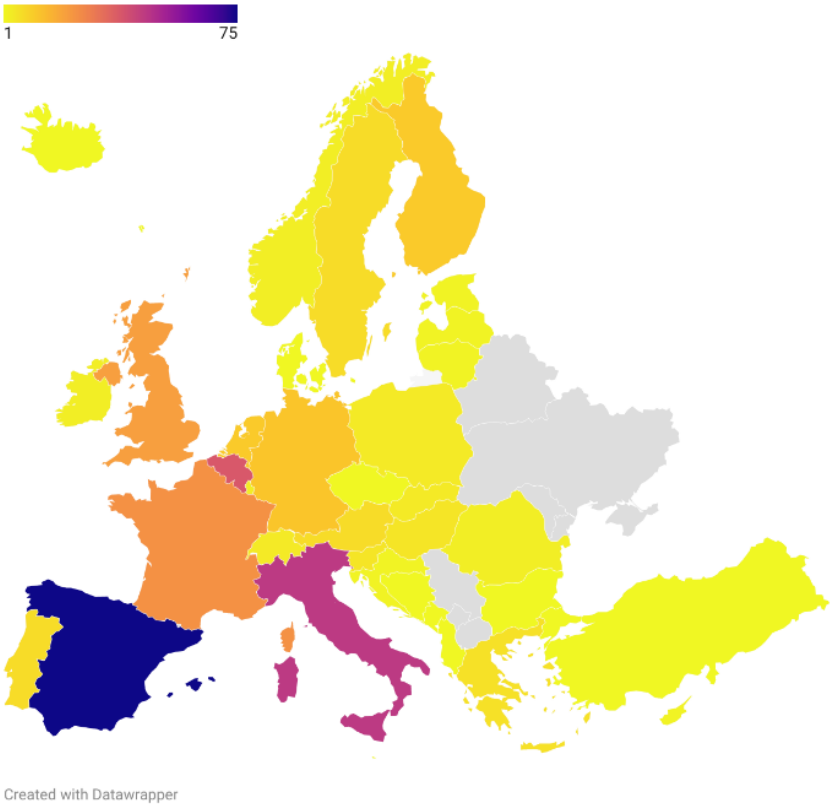
Table 3 – Stakeholder breakdown by type and subtype

Type	Tourism	Data Management	EU level	National level	Regional / Local Level	Total
Academic expert	41	11	-	-	-	**52**
DMO	**-**	-	0	28	22	**50**
Industry association	-	-	-	-	-	**29**
Industry operator	56	35	-	-	-	**91**
International organisation	-	-	-	-	-	**14**
Networks and initiatives	**-**	-	-	-	-	**38**

Type	Tourism	Data Management	EU level	National level	Regional / Local Level	Total
Policy maker	-	-	7	8	42	**57**
Other	**-**	-	-	-	-	**3**
Total	**97**	**46**	**7**	**36**	**64**	**334**

The figure below provides a visual representation of the large number of European nationalities covered by the mapped stakeholders. In fact, the final list of stakeholders included individuals from 49 different countries, mainly from Europe, but also from extra-European countries, such as Australia, Brazil, Israel, Mexico, Nepal, Russia and the USA.

Figure 4 – Stakeholders by country in Europe



3. Literature review

Simultaneously with the stakeholder mapping, a review of the literature sources about data management for tourism was also conducted by the study team.

The analysis of past and current experiences of destinations in the use of data for tourism was particularly important to validate the project's results. Moreover, the identification of the gaps in literature helped the team to better design and tailor the various project tasks.

3.1. Sources framework and preliminary literature review

Firstly, the literature review aimed at identifying the most prominent texts and sources describing how destinations are using data for tourism. A comprehensive body of papers included – but was not limited to – several scholarly works and practitioners' reports. This body of literature was reviewed in order to obtain an up-to-date snapshot and full understating of the ways in which destinations collect, store, collate, transmit, use (and re-use) tourism data.

In order to prepare the ground for an orderly and effective identification and analysis of sources, the project team set up a specific framework for standardised and homogeneous mapping of literature sources. Each piece of literature (or reference) was mapped according to 17 fields, as shown in the table below:

Table 5 – Fields of reference for each piece of literature

Field	Description
Source ID	A unique number to identify each reference
External ID	Public identification number, if available (e.g. ISBN, DOI…)
Source title	Main heading title of the reference
Source type	Article, book, book chapter, company report, conference/workshop proceeding, Government publication interview, journal, newspaper, study, thesis, other
Year	Year of publication
Author	Author, coordinator or list of co-authors
Organisation	Organisation which the reference is affiliated to
Type of organisation	Public sector administration, international organisation/agency, private sector, independent, other
Geographical coverage	Geographical area where the work is applicable
Type of geographical coverage	City, national region, world region, worldwide
EU/Non-EU	Reference scope of application
Type of technology	Blockchain, Smart Mobility, Smart city management, Augmented reality, Artificial intelligence, Big Data, Social networks, General review, IoT, Other
Brief summary	Abstract, synopsis or conclusions outline
Weblink	URL where the reference might be downloaded or accessed
Formatted reference	Referral in APA 6th Ed.
Thematic areas covered	Topics related to the reference

3.2. Research questions and eligibility criteria

Such a comprehensive literature review was conducted through a set of bibliographic tools, which generated references as an output, which, in turn, were analysed to determine their relevance to the research and their connection to the project.

In a view to assess such relevance, the project goals were expressed in terms of research questions, so that the team could more easily understand if each piece of literature was useful in addressing one or more relevant issues.

Table 6 – Eligibility criteria for the selection of the relevant literature

Area	Research questions for the selection of the relevant literature
Data uses	1. How have been tourism destinations using data so far? 2. What benefits and constraints have been destinations finding related to the use of data? 3. How could tourism destinations find convenient support when aiming to improve their data management systems? 4. Which kind of data are the most demanded and used by tourism destinations? 5. What applications are currently used for managing data in the leading destinations?
Good practices	6. How are destinations currently exchanging data and sharing practices? 7. How could the tourism context be better analysed in terms of practices on data? 8. Are there benchmarking initiatives for selecting good practices? 9. Which are the most relevant criteria for selecting practices? 10. When selecting good practices about destination data management, how much should the different criteria weight?
Future trends	11. Which have been the technological, demographic, and policy-related trends concerning data uses in the destinations? 12. Who are the different stakeholders and their roles in the generation of these trends? 13. Which are the main drivers that move each trend forward? 14. How could tourism destinations foresee the long-term trends and act proactively?
Areas for cooperation	15. Which are the constraints and enablers for destinations' cooperation? 16. Are there areas where destinations are more likely to commit strong cooperation in the future? Mainly among governance, policy, availability of skills and resources, and IT infrastructures. 17. What kind of agreements could be more advisable to sign between destinations? 18. How could a given destination find support from other destinations when improving its data management system? 19. Which institutions, coalitions, associations, etc. could provide the best platforms to agree on cooperation initiatives?

Once the research questions were designed and agreed upon, the study team defined the criteria for deciding whether a reference was to be included within the scope of the literature review. In order to obtain an appropriate balance between academic rigour and comprehensiveness, the selection criteria chosen were relatively loose, which allowed to filter out completely irrelevant sources, while retaining all those of interest, even if less curated than traditional commercial or academic publications.

Therefore, the study team decided to map and analyse documents following this scheme applying to both academic and grey literature:

- **General attributes:**

  a) Date: Written/published from 1990 onwards;
  b) Origin: Published worldwide, not only in the EU;

c) Language: Mostly (but not limited to English) – documents written in other languages (e. g. German, French, Spanish, Norwegian) were also added to the pool, when relevant.

- **Quality:**

d) Be consistent works, developed according to scientific standards and following an evidence-based approach also in relation to estimates and possible future evolutions;

e) Provide strong evidence on smart tourism-related practices (i.e. not providing just superficial mentions or information lacking relevant supporting sources/data);

f) Relevant to the theme – that is, focusing mainly on the management of data for tourism, not incidentally.

3.3. Academic literature review and updating alerts

The scientific literature identified has been reviewed following a hybrid approach, embedding qualitative and descriptive elements into a structured approach based on Boolean logic (i.e. creation of a list of references that comply with pre-designed criteria). The result of this hybrid approach was a sound and comprehensive list of sources, scientifically robust, but also tailored and flexible enough to support a variety of needs (i.e. general dissemination of scientific concepts, provision of key concepts and basic information to inform other activities, e.g. interviews, etc).

Consequently, the first stage of this task was to conduct an academic literature review, using Boolean logic to map the targeted references. This academic review was run over premium indexed journals and conference proceedings, in accordance with the standard approach when conducting systematic reviews. The source databases included: EBSCOhost, ProQuest, Scopus, and Web of Science. Considering their frequently overlapping scope, the same results were frequently obtained by two or more of sources, so a duplicate detection process was run afterwards in order to remove reiterated references.

To conduct the Boolean search, the study team first outlined a set of relevant keywords for the various research questions, also using a thesaurus to include all possible synonyms. For instance, the term “data” could also be found in the literature as “info”, “input”, or “facts”. Further widening the synonyms spectrum, it could be also found as “knowledge”, “evidence” or “story”.

Thus, a set of keyword search commands were introduced in those sources, inputting the words to locate and the constraints to respect. After each search, the results were screened before being downloaded and registered, if deemed relevant. The process was iterative since the results were at the beginning too broad for being controlled exhaustively. For instance, similar topics in different databases would generate an unmanageable amount of results, and for this reason the study team gradually narrowed the terms to search or the constraints to adopt, as shown in the following table:

Table 7 – Examples of search criteria and corresponding outputs

Source (Database)	Search criteria	Results output
EBSCOhost	(development OR application OR creation OR establishment OR launch OR result) AND (good practice OR joint initiative OR framework OR city competition OR heritage promotion) AND (tourism)	3.395
	(data management OR data owner OR data usage OR data sharing OR data analytics) AND (smart tourism OR city tourism OR tourism management OR city	111

	cooperation OR city network) AND (implementation OR adoption OR completion OR development OR launch OR enhancement)	
	(smart tourism develops OR cultural heritage OR urban tourism OR tourism management) AND (artificial intelligence OR data analytics OR Big Data OR data science) AND (challenges OR solutions OR factors OR enablers)	97
ProQuest	(smart tourism OR digital tourism OR cultural heritage OR urban tourism OR urban sustainability) AND (research data OR sensitive data OR personal data OR high value dataset) AND (data held by the public sector OR publicly funded data OR data management) AND la.exact("English")	276.329
	(smart tourism OR digital tourism OR cultural heritage OR urban tourism OR urban sustainability) AND (research data OR sensitive data OR personal data OR high value dataset) AND (data held by the public sector OR publicly funded data OR data management) AND la.exact("English") AND PEER(yes)	57.442

Within the body of literature under assessment, a number of scientific reviews and journals were also identified. Rather than offering a focus on a specific issue, these were particularly useful to list and classify additional sources on relevant topics, and to feature important ongoing debates and discredited theories. They therefore served as valuable guidance documents, which helped the study team in streamlining the identification of relevant works through a snowball approach.

The following table presents the latest reviews and the number of sources they assessed.

Table 8 – Latest systematic reviews on smart tourism

ID	Literature review	Targeted works
2	Johnson, A. G., & Samakovlis, I. (2019). A bibliometric analysis of knowledge development in smart tourism research. Journal of Hospitality and Tourism Technology, 10(4), 600–623	**38**
18	Mehraliyev, F., Chan, I. C. C., Choi, Y., Koseoglu, M. A., & Law, R. (2020). A state-of-the-art review of smart tourism research. Journal of Travel and Tourism Marketing, 37(1), 78–91	**20**
81	Nascimento Machado, L. A. (2020). Destinos turísticos inteligentes e desenvolvimento sustentável: uma revisão sistemática da literatura científica. CULTUR: Revista de Cultura e Turismo, 14(1), 137–154.	**10**
163	Soliman, M., Cardoso, L., Almeida, G. G. F., Araújo, F. F., & Vila, A. A. (2021). Mapping smart experiences in tourism: A bibliometric approach. In European Journal of Tourism Research (Vol. 28)	**12**
237	Shafiee, S., Rajabzadeh Ghatari, A., Hasanzadeh, A., & Jahanyan, S. (2021). Smart tourism destinations: a systematic review. Tourism Review, ahead-of-p(ahead-of-print)	**17**
249	Kontogianni, A., & Alepis, E. (2020). Smart tourism: State of the art and literature review for the last six years. Array, 6	**40**
266	Ye, B. H., Ye, H., & Law, R. (2020). Systematic review of smart tourism research. Sustainability (Switzerland), 12(8)	**7**

The output of the academic literature review consisted in a total of 355 academic references, including articles, books, chapters, proceedings, studies, and theses. In addition to this, the study team set up an alert system in ‘Web of Science’ to send automatic updates on relevant new publications. The system allowed to continuously check the ‘Web of Science’ databases for new documents matching the predefined search criteria, supporting the team in its effort of systematically updating and expanding the literature base.

3.3.1. Complementary grey literature review

In addition to the academic literature review, the study team also screened grey sources, like the documents published in the websites of various institutions dealing with technology and tourism. Grey literature was therefore gathered using an unstructured approach, including:

- **Vertical screening**, checking notable institutions and bodies on the field: apart from the EU Commission and European bodies (e.g. AENOR), the team also examined reports, declarations, and accounts issued by worldwide agents like the World Travel and Tourism Council, the UN World Tourism Organisation, the Atlantic Cities Associations, Eurocities, the World Economic Forum, the World Tourism Cities Federation, or consultancies.
- **Horizontal screening**, undertaking a cross-sectional examination depending on the type of document, regardless the publisher: grey literature repositories were explored, bringing over works as working papers, guides, official declarations, policy statements, advisory reports, evaluation briefings, consultants' deliverables, tourism trends forecasts, regulations, certification standards, etc. The repositories comprised GreyNet International (former OpenGrey), OAIster, and the Directory of Open Access Journals (DOAJ).

As a result, 123 grey references were identified and recorded in the database.

3.3.2. Integrated database and intermediate software

Once the 355 academic articles and the 123 grey references were put together/collected, the database included a total of 478 pieces of literature. The study team generated a preliminary database using the reference manager Mendeley as an intermediate processing platform, which allowed to generate the references in different formats, detect duplicates, or ensure the quality of metadata.

The study team then integrated the final list of references and analysed their composition. As shown in Table 5, more than half of the records were academic papers (258) and conference proceedings (49), with also an important number of studies coming from international organisations (34) or book chapters (35).

Table 9 – Reference by Category and Source Type

Category of paper/ Source type	Academia/ University	Independent	International Organisation/ Agency	Private Sector	Public Sector admin.	Other	Total
Article	258				49		**258**
Book	4		7				**11**
Book Chapter	35		1		4	8	**36**
Company Reports				1			**1**
Conferences/ workshops proceedings	49		4				**53**
Government Publications			8				**8**
Newspapers			13	5			**13**
Studies	2		34				**84**

Category of paper/ Source type	Academia/ University	Independent	International Organisation/ Agency	Private Sector	Public Sector admin.	Other	Total
Theses	7						**7**
Other		4	2	1	1	42	**7**
Total	**355**	**4**	**69**	**7**	**1**	**42**	**478**

The 478 sources have been published across a wide timeframe, going back to 1997. At the same time, however, it is not until 2010 that several relevant publications were registered, pointing to a significant critical mass rather than mere general reviews on the topic. The year 2019 was remarkably prolific, when 90 publications were registered on almost all the topics under analysis. Overall, the topics that have been more widely considered are big data, smart mobility, social networks, and the use of augmented reality.

Table 10 – Sources by year and technological topic

Technology Year	General Review	Artificial Intelligence	Augmented Reality	Big Data	Blockchain	IoT	Smart city management	Smart Mobility	Social Network	Other	Total
1997	1										**1**
2000	1										**1**
2003	1										**1**
2004	1										**1**
2005	1										**1**
2006	1										**1**
2007				1							**1**
2009	1										**1**
2010	1		1					1		1	**4**
2011	3							1		3	**7**
2012	3										**3**
2013	9			1		1				1	**12**
2014	10		1	5				1		3	**20**
2015	13	1	3	7				2	2	11	**39**
2016	18		1	10		3	3		2	4	**41**
2017	29	1	1	12		2	4	1	6	14	**70**

Technology Year	General Review	Artificial Intelligence	Augmented Reality	Big Data	Blockchain	IoT	Smart city management	Smart Mobility	Social Network	Other	Total
2018	37		2	10	1	2	2	2	5	10	**71**
2019	45	2	2	13	3		2	5	1	17	**90**
2020	36		1	9			5	6	4	7	**68**
2021	20	1		3	2	1		9	1	7	**44**
Total	**232**	**5**	**12**	**71**	**6**	**9**	**17**	**27**	**21**	**78**	**478**

In terms of geographical coverage, 316 documents addressed general issues with no specific geographic focus or with a worldwide perspective (e.g. e-marketing for tourism destinations, or the specific challenges for tourism in islands).

Table 11 – Main thematic areas covered by organisation type

Tourism					Data Management			Other	Total
Thematic area Covered/ Source Type	Economics	Environment	Policy	Technology	Privacy	Technology	Policy		
Academia/ University	93	53	45	50	40	21	63	169	534
Independent								4	4
International Organisation/ Agency	15	8	14	2	5	2	14	39	99
Private sector					3		2	4	9
Public sector Administration	1	1	1	1					4
Other	3	2	1		12	4	11	21	54
Total	**112**	**64**	**61**	**53**	**60**	**27**	**90**	**237**	**704***

Note: A source may deal with more than one thematic area at the same time. For this reason, totals in this table exceed the total number of sources analysed.

Finally, as shown in the following table, most sources analysed dealt with tourism economics or data management policy in tourism destinations. Data privacy or environmental topics were also themes quite as much addressed by the literature, especially when authored by scholars.

4. Collection and analysis of data uses for tourism

The extensive literature review performed on rolling basis since the beginning of the study allowed to identify 200 relevant cases of tourism data use. The collected information on both well-known and emerging data uses was introduced in a database to facilitate the analysis of the multiple dimensions of the topic at hand.

The study team could then proceed with an extensive mapping of the data uses for tourism purposes. This activity allowed to increase the understanding of the state of the art of data usage in tourism destinations, identifying key challenges and solutions adopted to overcome them.

Building upon the database and the mapping activity, a set of most relevant dimensions were selected as part of a specific methodological approach. The latter was developed by the study team to consistently analyse data for tourism uses in a coherent and comprehensive manner, supporting further activities. Extensive desk research was supported by expert consultants in order to test evidence validity and highlight further streams of research.

Box 1 – Identification of smart tourism data uses for tourism

The identification of the 200 data uses for tourism was conducted through extensive desk research and literature review, as described in Section 2, as well as by collecting relevant information during interviews with relevant stakeholders.

In consulting relevant sources and databases, the study team targeted its efforts in the following way:

- Screening applications of cities to the project support programme;
- Conducting web-based research on specific websites or using specific strings:
  - Smart cities; Smart cities + Horizon 2020; Smart cities + Interreg;
  - Data tourism; Data tourism + Horizon 2020; Data tourism + Interreg;
  - Smart tourism; Smart tourism + Horizon 2020; Smart tourism + Interreg;
  - Data sharing; Data sharing + Horizon 2020; Data sharing + Interreg;
  - Data cooperation; Data cooperation + Cities; Data cooperation + Horizon 2020 + Cities; Data cooperation + Interreg + Cities;
  - Tourism + Horizon 2020; Tourism + Interreg.

The research on the web took place in Google, Google Scholar, CORDIS, and in KeepEU, leading to the following results:

- Smart cities (11198 in CORDIS, 40 in KeepEU)
- Data tourism (2091 in CORDIS)
- Smart tourism (643 in CORDIS, 6 in KeepEU)
- Data sharing (10836 in CORDIS, 27 in KeepEU)
- Data cooperation (6904 in CORDIS)
- Tourism (4375 in KeepEU).

The web search allowed to identify also 124 initiatives related to smart cities and data exchange, as well as 48 additional papers used for the definition of megatrends, challenges and gaps.

4.1. A database of data uses for tourism

Building upon the increased understanding of tourism data uses deriving from the initial literature review, a number of key characteristics of tourism data were identified. The study team then categorised and grouped the 200 data uses collected according to repeating

patterns. Such patterns were consequently mapped in a database, appositely designed in order to:

- **Serve as a taxonomy of ways and purposes** in which tourist destinations are using data for tourism;
- **Provide an analytical structure** throughout the study and allow to continue research in an orderly and efficient way;
- **Facilitate a common understanding** of data for tourism concepts.

Therefore, the study team characterised and clustered the 200 data uses according to overarching groups of existing practices. The outcome of this activity served the purpose of informing following streams of analysis and in particular the identification and presentation of 30 smart tourism good practices and 10 notable cases of cooperation in the field of smart tourism.

4.1.1. Database dimensions

The database used to classify the previously mentioned 200 cases of data use has been designed by the study team in order to include the following dimensions and (sub)categories:

- **Country of implementation:** Performing an initial mapping of geographies that can indicate areas where favourable policy frameworks have been implemented or where tourism innovation is more likely to happen for endogenous factors.
- **Current phase of the data use:** Helpful to identify frontrunners and late adopters, but also to identify those experiences that are already concluded and can therefore be instructive to understand potential mistakes or barriers.
    - Planned
    - Implemented/under implementation
    - Discontinued
- **Purpose area of data use:** Consist of the objective for making use of data.
    - Improve interaction and engagement with the tourist
    - Conduct market analyses and inform decision-making
    - Improve planning and operations of tourism services
    - Increase destination sustainability and accessibility
- **Type of data user:** Distinguish the subject who is making use of data, including both public and private actors.
    - Tourism destinations and public authorities
    - Private sector - Tourism industry
    - Private sector - Other (mobile phone operators, advertisers, etc.)
- **Source of data:** Define the origin of the data being used, distinguishing between different data generators and data sets.
    - User-generated data
        - Textual
        - Photo
    - Device data
        - Geospatial and satellite datasets (GPS, mobile roaming, RFID, Bluetooth, WiFi networks, meteorological)
        - Smart city (pollution, traffic, waste, etc.)
    - Transaction data
        - Web-search and webpage visiting

        - Online booking and purchasing
        - Consumer card transactions
    - Other datasets from public or private entities
        - Business information (restaurants, hotels, etc.)
        - Statistics
        - Context-specific information

- **Data provider type:** Mostly to identify whether data is collected by public entities or by private sector actors and possibly in the framework of business/commercial activities.
    - Private
        - B2B - Open data approach
        - B2B - Data monetisation on a data marketplace
        - B2B - Data exchange in a closed platform
        - B2G - Data donorship or civic data sharing
        - B2G - B2G data partnership
        - B2G - Intermediaries (platform or dedicated centres)
        - Other
    - Public
- **EU/national legal constraints for data handling:** Useful to better frame data flows and possible barriers to the structural implementation of smart tourism solutions based on enhanced data management/sharing.

4.2. Analysis of challenges and solutions for data uses

After the identification and classification of the different data for tourism uses in destinations, the following step included the analysis of challenges and solutions associated to them.

The study team employed a number of data collection techniques including additional desk-based research and semi-structured interviews conducted with experts and industry actors, as described in the following paragraphs.

4.2.1. Complementary desk research

Building upon the body of literature reviewed in the early stages of the study, the project team conducted further desk research in order to identify additional relevant datasets and pieces of literature. The aim was to gather additional information that could help identifying conditions enabling the different data use in destinations leading to a prioritisation of the challenges identified, also in consideration of the potential public budget constraints that destinations might face. It was therefore possible to develop an initial list of priority challenges and solutions to be further investigated and analysed.

The following table includes some of the additional pieces of literature mapped and reviewed in this phase:

Table 12 – Additional sources consulted for the analysis of challenges and solutions for data uses

#	Source title
1	Alcántara-Pilar, J. M., del Barrio-García, S., Crespo-Almendros, E., & Porcu, L. (2017). Toward an understanding of online information processing in e-tourism: Does national culture matter? Journal of Travel & Tourism Marketing, 34(8), 1128–1142.
2	Alepis, E., Kabassi, K., & Virvou, M. (2017, November). Personalized museum exploration by mobile devices. In Interactive Mobile Communication, Technologies and Learning (pp. 353-360). Springer, Cham.
3	Ardito L., Cerchione R., Del Vecchio P., Raguseo E. (2019). Big data in smart tourism: challenges, issues and opportunities, Current Issues in Tourism, 22:15, 1805-1809.

	Scientific journal article.
4	Beinat, E. (2001). Privacy and location-based services: Stating the policies clearly. Geoinformatics, 4, 14–17 and Narayanan, A., & Shmatikov, V. (2009). De-anonymizing social networks. In Proceedings of the 30th IEEE Symposium on Security and Privacy (pp. 173–187). Berkeley, CA: IEEE.
5	Brandt, T., Bendler, J., & Neumann, D. (2017). Social media analytics and value creation in urban smart tourism ecosystems. Information & Management, 54(6), 703–713.
6	Buonincontri, P., & Micera, R. (2016). The experience co-creation in smart tourism destinations: A multiple case analysis of European destinations. Information Technology and Tourism, 16(3), 285–315.
7	Celdrán Bernabeu, M.A., Mazón, J., Giner, D., Baidal, J. (2016). Big Data and Smart Tourism Destinations: Challenges and opportunities from an industry perspective, 9.
8	Crotts, J. C., Mason, P. R., & Davis, B. (2009). Measuring guest satisfaction and competitive position in the hospitality and tourism industry: An application of stance-shift analysis to travel blog narratives. Journal of Travel Research, 48(2), 139-151.
9	Da Rugna, J., Chareyron, G., & Branchet, B. (2012). Tourist behaviour analysis through geotagged photographies: A method to identify the country of origin. In 2012 IEEE 13th international symposium on Computational Intelligence and Informatics (CINTI), Budapest, Hungary.
10	European Commission (2021). The EU Pact for Skills – Skills Partnership for the Tourism Ecosystem.
11	Figueredo, M., Cacho, N., Thome, A., Cacho, A., Lopes, F., & Araujo, M. (2017). Using social media photos to identify tourism preferences in smart tourism destination. 2017 IEEE International Conference on Big Data (Big Data).
12	Fuchs, M., Höpken, W., & Lexhagen, M. (2014). Big data analytics for knowledge generation in tourism destinations–A case from Sweden. Journal of Destination Marketing & Management, 3(4), 198–209.
13	Furht, B., & Villanustre, F. (2016). Introduction to big data. In Big Data Technologies and Applications (pp. 3–11). Cham: Springer International Publishing.
14	Gajdošík T. (2019) Big Data Analytics in Smart Tourism Destinations. A New Tool for Destination Management Organizations? In: Katsoni V., Segarra-Oña M. (eds) Smart Tourism as a Driver for Culture and Sustainability. Springer Proceedings in Business and Economics. Springer, Cham.
15	Gretzel, U., Reino, S., Kopera, S., & Koo, C. (2015). Smart tourism challenges. Journal of Tourism, 16(1), 41-47.
16	Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. Electronic Markets, 25(3), 179–188.
17	Gretzel, U., Zhong, L., Koo, C., Morrison, A., & Morrison, A. (2016). Application of smart tourism to cities. International Journal of Tourism Cities, 2(2), 216–233.
18	Hjalager, A. M. (2002). Repairing innovation defectiveness in tourism. Tourism Management, 23(5), 465–474.
19	Jackson, S. (2016). Prediction, explanation and big(ger) data: A middle way to measuring and modelling the perceived success of a volunteer tourism sustainability campaign based on 'nudging'. Current Issues in Tourism, 19, 643–658.
20	Janet E. Dickinson, Karen Ghali, Thomas Cherrett, Chris Speed, Nigel Davies & Sarah Norgate (2014). Tourism and the smartphone app: capabilities, emerging practice and scope in the travel domain, Current Issues in Tourism, 17:1, 84-101.
21	Kuusik, A., Tiru, M., Ahas, R., & Varblane, U. (2011). Innovation in destination marketing: The use of passive mobile positioning for the segmentation of repeat visitors in Estonia. Baltic Journal of Management, 6(3), 378-399.
22	Lee, P., Hunter, W. C., & Chung, N. (2020). Smart tourism city: Developments and transformations. Sustainability, 12(10), 3958.
23	Li, J., Xu, L., Tang, L., Wang, S., & Li, L. (2018). Big data in tourism research: A literature review. Tourism Management, 68, 301–323; Xiang, Z., Du, Q., Ma, Y., & Fan, W. (2017). A comparative analysis of major online review platforms: Implications for social media analytics in hospitality and tourism. Tourism Management, 58, 51e65.
24	Li, X., Wu, Q., Peng, G., & LV B. (2016). Tourism forecasting by search engine data with noise-processing. African Journal of Business Management, 10(6), 114.
25	MacCannell, D. (2013). The tourist: A new theory of the leisure class. University of California Press.
26	Masseno, M. D. (2016). Personal data circulation from the EU to USA and now what for the American Tourism Industry with business in Europe. In 23rd International Tourism Safety Conference, Las Vegas.
27	Masseno, M. D., & Santos, C. T. (2018). Assuring Privacy and Data Protection within the Framework of Smart Tourism Destinations. MediaLaws-Rivista di Diritto dei Media,(2), 251-266.
28	Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Smart technologies for personalized experiences: a case study in the hospitality domain. Electronic Markets, 25(3), 243–254.

29	Nilbe, K., Ahas, R., & Silm, S. (2014). Evaluating the travel distances of events visitors and regular visitors using mobile positioning data: The case of Estonia. Journal of Urban Technology, 21(2), 91-107.
30	Raun, J., Ahas, R., & Tiru, M. (2016). Measuring tourism destinations using mobile tracking data. Tourism Management, 57, 202-212.
31	Shi, Y. (2014). Big data: History, current status, and challenges going forward. Bridge, 44(4), 6–11.
32	Shoval, N., & Ahas, R. (2016). The use of tracking technologies in tourism research: The first decade. Tourism Geographies, 18(5), 587-606.Segarra-Oña (ed.), Smart Tourism as a Driver for Culture and Sustainability, chapter 0, pages 15-33, Springer.
33	Sobolevsky, S., Sitko, I., Des Combes, R. T., Hawelka, B., Arias, J. M., et al. (2014). Money on the move: Big data of bank card transactions as the new proxy for human mobility patterns and regional delineation. the case of residents and foreign visitors in Spain. In 2014 IEEE international congress on big data, Anchorage, USA.
34	Song, H., & Liu, H. (2017). Predicting tourist demand using big data. In Z. Xiang & D. Fesenmaier (Eds.), Analytics in Smart Tourism Design, Tourism on the Verge (pp. 13–29). Cham: Springer International Publishing Switzerland.
35	Tiru, M., Kuusik, A., Lamp, M. L., & Ahas, R. (2010). LBS in marketing and tourism management: Measuring destination loyalty with mobile positioning data. Journal of Location Based Services, 4(2), 120-140.
36	Tribe, J., & Mkono, M. (2017). Not such smart tourism? The concept of e-lienation. Annals of Tourism Research, 66, 105-115.

The complementary desk research helped also to set-up an interview round involving tourism experts from the industry and the academia. This activity was beneficial not only for the preparation of the questionnaire and the selection of topics, but also to actually identify additional relevant experts who could be involved in the round of interviews.

4.2.2. Round of interviews with selected experts

Between July and September 2021, 13 experts were consulted through semi-structured interviews. Accordingly, the interviews were conducted following a pre-developed high-level guide that covered the areas of data uses for tourism, challenges and potential solutions.

During the discussions, many additional contacts and references were shared by the interviewees that proven to be highly valuable for the further development of the ‘database of data uses for tourism and also for identifying challenges, potential solutions and future trends of smart tourism.

Selection of interviewees

Following the mapping of project stakeholder, a long-list and then a short-list of potential interviewees were created. The main criteria for choosing the interviewees were their relevant expertise in the fields of tourism and data management, years of experience and current position within their organisations. In order to grasp a broader understanding of potential challenges and opportunities in data uses for tourism, interviews outside of the EU (US, Brazil, Nepal, Israel) were also conducted.

As a result, the final list of 13 experts included the following individuals (type of organisation/expertise in bold):

- Research director of a **national tourism agency**
- Integrated program coordinator of a **DMO**
- Director of a **smart tourism company**
- Marketing and research officer of a **national tourism board**
- CEO of a **company providing data driven solutions**
- Director of Tourism Research, Development & Innovation of a **national tourism statistical office**
- Tourism research professor at a **university**
- Head of international sales of a **company providing data driven solutions**
- Cabinet Assessor of a **regional tourism office**
- Chief innovation officer of a **smart tourism company**
- Alliances and channels manager of a **company providing data driven solutions**

Questionnaire structure

The above-mentioned semi-structured interviews were conducted following a guidance document specifically designed by the study team, which wasthe actual interview questionnaire.

The questionnaire was developed according to the following sections, each one including multiple potential questions, envisaging an overall duration of the interview of approximately 45 minutes to 1 hour:

Table 13 - Questionnaire for semi-structured interviews on data management challenges in the tourism sector

1. Innovative solutions	
1.1	Could you please give us an overview of your experience – and more broadly your organisation's experience – in the field of tourism and, more specifically, data use for tourism?
1.2	Could you tell us about one or more cases – either already implemented or just potential – in which data are used to make tourism smart (for instance by facilitating access to tourism and hospitality products and services, by making tourism more accessible and sustainable, or by leveraging on the cultural heritage to improve the tourism experience)? • What technological enablers are needed to implement this(these) data use(s)? • In what urban tourism destinations would this(these) data use(s) be especially applicable, considering factors such as size, tourism assets, availability of skills, overall digitalisation level, etc.?
2. Challenges	
2.1	In general terms, what are the challenges that may hamper the use of data for tourism?
2.2	In your experience, what are the most significant ones?
2.3	Focusing on one of the previously mentioned data uses at a time, what specific challenges does this practice pose? Consider all the following areas: policy, governance, IT infrastructure, availability of skills and resources, perception of risks and benefits, business model and business planning, availability of knowledge, cooperation networks, etc. • How do you see the EU/national legal constraints for data handling? • How challenging is the financing of these smart tourism solutions? • What data management issues do you see? (Data collection, data fragmentation, data growth, etc.) • What are the challenges to face when working with a third-party data provider? • What are the challenges to face when including other stakeholders from the tourism ecosystem?
2.4	Are these challenges particularly severe for certain types of destinations? In other words, are there certain conditions in EU tourism destinations that may exacerbate such challenges?
2.5	What are the underlying causes of these challenges?
3. Solutions	
3.1	In general terms, what are the conditions that facilitate the overcoming of the key challenges urban tourism destinations are facing nowadays in the use of data for tourism? What is required from the different stakeholders (policy makers, municipalities, tourism destinations, etc.) of the tourism ecosystem to overcome these challenges?
3.2	Considering one challenge at a time, what has been or may be the solution?
3.3	What factors could hamper the implementation of this solution?
3.4	Conversely, what factors could facilitate it? In this respect, how can EU urban tourism destinations be assisted/supported in the implementation of such a solution?
4. European data space for tourism	
4.1	Would you be in favour of the creation of a European data space for tourism?
4.2	What benefits would such tourism data space generate for both authorities and operators?
4.3	How would such tourism data space foster the previously mentioned data uses?
4.4	Do you expect any challenges (e.g. opposition or resistance from certain stakeholders) in connection with the implementation of the data space for tourism?

5. Conclusions	
5.1	Are there any sources that you may share regarding the data uses, their challenges and the corresponding solutions that we discussed together?

4.2.3. Triangulation of sources and analysis of evidence

For each interview, a small report was produced by the study team, in order to keep track of the evidence emerged in a consistent and comparable way. The comparison of the interview outcomes with the classification of the activity performed previously and with the preliminary list of challenges and solutions developed by the study team allowed the study team to validate (or discard) their initial hypothesis and preliminary evidence.

The output of this activity has been included in the main body of the study(Section 2.2. ‘The challenges in using data for tourism’).

5. Mapping and analysis of good practices

The study includes a compendium of 30 smart tourism 'good practices'. Good practices showcase inspirational examples that witness the benefits of adopting smart tourism solutions, potentially replicable in other EU destinations.

5.1. Selection of good practices

Starting from the 200 data uses in tourism collected and mapped in the previous phases of the study (Section 3 'Good practices'), the study team developed a specific approach to evaluate and select them. The top 30 data uses were selected as 30 good practices and subsequently analysed in greater detail in order to be presented in a smart tourism compendium.

The project team, based on the evidence collected previously from multiple sources, identified a **set of 8 evaluation criteria**.

1. **Sustainability**: One of the pillars of the smart tourism concept is the increase in operations efficiency and costs optimisation linked to the structural adoption of data-driven approaches. This not only leads to long-term sustainability of the business model of the destination, but it also implies positive spill-overs in terms of overall environmental and social sustainability.
2. **Accessibility and inclusivity**: Making data-driven services available to the widest possible number of stakeholders and end-users is part of the concept of smart tourism. Making data sets and information easily end largely available to the entire tourism ecosystem is functional to the establishment of synergies, the generation of economies of scale and to the creation of new services and value chains.
3. **Cultural heritage**: The combination of history, architecture and traditions is an integral part of a unique tourism experience from the visitor's side and creates additional and specific business streams for the local tourism ecosystem. Supporting and enhancing the cultural heritage is therefore crucial to strengthen the destination value proposition and brand.
4. **Data usage**: The types of data shared and the structure of data flows have a direct impact on the successful adoption of a data-driven solution in the long-term, as well as positively contribute to sustainability, inclusivity and accessibility.
5. **Innovativeness of the solution**: Smart tourism is closely linked to the uptake of new technologies, which often increases digitalisation and computing capabilities to improve destination management and tourism services.
6. **Relevance of technology**: In line with the previous criterion, technology is a pivotal element in the adoption of smart solutions, also when it comes to tourism. Smarter solutions are technology-intensive and sometimes highly innovative, with the potential to foster modernisation of the entire tourism ecosystem.
7. **Tourists-residents relationship**: Smart tourism also aims at improving the interaction between local citizens and tourists to favour a quality tourism experience and ensure that tourism flows do not impact negatively on locals' lives.
8. **Stakeholder Involvement**: The successful adoption of smart tourism solutions based on data sharing and data mastering often runs in parallel with a wide engagement of stakeholders from the entire ecosystem, often involved in private-public synergies.

Each data use was evaluated against each criterion, on a low-medium-high scale. The following table shows the application of the evaluation scale chosen for each criterion, briefly explaining the rationale behind it.

Table 14 – Overview of evaluation criteria

	Evaluation scale		
Evaluation criteria	**Low**	**Medium**	**High**
Sustainability	The good practice does not aim at improving the sustainability of the destination	The good practice does not focus on sustainability; however, it has positive effects on it	The improvement of the sustainability of the destination is one of the key aims of the good practice
Accessibility and inclusivity	The good practice does not aim at improving the accessibility and inclusivity of the destination	The good practice does not focus on accessibility and inclusivity; however, it has positive effects on it	The improvement of the accessibility and inclusivity of the destination is one of the key aims of the good practice
Cultural heritage	The good practice does not aim at enhancing the cultural heritage of the destination	The good practice does not focus on cultural heritage, however; it has positive effects on it	The enhancement of the cultural heritage of the destination is one of the key aims of the good practice
Data usage	Data is used by one actor only	Some sort of data exchange between different actors takes place	Data-driven insights and results are openly available to any interested actors
Innovativeness of the solution	The technological solution is already widely available on the market	The technological solution has already been piloted, but it is not widely available on the market yet	The technological solution is completely experimental and requires research and development activities
Relevance of technology	The technological solution is not essential for the implementation of the good practice	The technological solution adopted contributed to the effectiveness and efficiency of the good practice	The good practice would not even exist without the technological solution adopted
Tourists-residents relationship	The good practice does not aim at improving the relationship between tourists and residents	The good practice does not focus on the relationship between tourists and residents; however, it has positive effects on it	The improvement of the relationship between tourists and residents is one of the key aims of the good practice
Stakeholder Involvement	The good practice does not involve any stakeholders (in addition to the implementing organisation)	The good practice is characterised by the involvement of 2-3 stakeholders	The good practice is characterised by the involvement of more than 3 stakeholders

Source: Author's elaboration

In addition to the scores across the 8 evaluation criteria, a set of 3 secondary criteria was used to balance the final list of the 30 good practices to be included in the compendium:

Table 15 – Secondary evaluation criteria for good practices selection

Secondary criteria	
Location	The selection of good practices considered the geographical balance, ensuring to cover many different countries, and also to select a few good practices from outside the EU
Size	The size of the destinations where the data uses took place was also factored/taken into account during the selection, with the aim of including destinations of many sizes (metropolitan areas, regions, big cities, small municipalities, etc.)
Duplication	Attention was finally paid to select good practices not previously included in other collections and compendia of good practices

Source: Author's elaboration

The following table corresponds to the data uses evaluation grid (included also in Section 3.1 of the study). Out of the 200 cases analysed, the table includes the evaluation of the 30 selected good practices and 30 runners-up, which were identified as 'second-bests'.

Table 16 – Good practices evaluation grid

Rank	Data use	Sustainability	Accessibility and inclusivity	Cultural heritage	Data usage	Innovativeness of the solution	Relevance of technology	Tourists-residents relationship	Stakeholder involvement	Total Score
1	**Italy**, Venice – Smart Monitoring System	2	3	3	3	2	3	3	2	21
2	**Spain** – DATAESTUR	2	3	3	3	2	3	2	2	20
3	**Finland**, Helsinki – MyHelsinki Open API	1	2	3	3	3	3	3	2	20
4	**The Netherlands**, Amsterdam – iBeaconMile	2	2	1	2	3	3	3	3	19
5	**Sweden**, Gothenburg – Event Impact Calculator	3	3	2	2	1	3	3	2	19
6	**Norway**, Stavanger – KvikktestNordic Innovation	2	2	1	3	3	3	1	3	18
7	**Italy**, Florence – Silfi Smart City Control Room	2	2	2	2	3	2	3	2	18
8	**Ireland**, Dublin – Smart Dublin Programme	2	2	3	3	2	2	2	2	18
9	**Portugal**, Lisbon – Shops with History	1	3	2	2	2	2	3	3	18
10	**France**, Grand Chambéry – Open data for eco-tourism	2	3	2	2	2	2	2	3	18
11	**The Netherlands**, Aruba – Biometric authentication	1	2	1	2	3	3	3	3	18
12	**United Kingdom**, London – Digital LITH	2	3	2	3	2	2	2	2	18
13	**Japan**, Kyoto – Sightseeing Comfort Map	2	2	1	3	3	3	1	2	17
14	**France** – DATA tourisme	2	2	2	2	2	2	2	3	17
15	**Spain,** Valencia – Intelligent Tourism Destinations	3	2	2	2	2	2	2	2	17
16	**Belgium**, Brussels – Neighbourhood walks	2	3	3	2	1	1	3	2	17
17	**Argentina**, Buenos Aires – City Smartvel's technology	2	2	2	1	1	3	3	3	17
18	**International** – Open tourism for people with disabilities	1	2	1	2	2	2	3	3	16
19	**Vietnam,** Ho Chi Minh City – Go!Bus application	2	3	2	2	1	1	3	2	16
20	**Spain,** Seville – City Past View	1	1	3	2	2	3	3	1	16
21	**Sweden,** Gothenburg – The Knowledge Hub	2	3	2	2	1	2	2	2	16

Rank	Data use	Sustainability	Accessibility and inclusivity	Cultural heritage	Data usage	Innovativeness of the solution	Relevance of technology	Tourists-residents relationship	Stakeholder involvement	Total Score
22	**Finland**, Helsinki – Real Time Crowding heatmap	1	2	1	3	3	3	2	1	16
23	**Italy,** Lombardy Region – Digital Tourism Ecosystem	1	2	2	3	1	2	2	3	16
24	**Germany,** Berlin – Virtual Experiences	1	1	3	2	1	3	3	2	16
25	**Romania,** Brasov – Augmented Reality Application	1	2	3	2	1	3	3	1	16
26	**Singapore**, Singapore –Virtual City Platform	2	2	2	2	2	2	2	2	16
27	**The Netherlands**, Nijmegen – Smart Tourism Management	2	2	2	2	1	2	2	3	16
28	**Belgium,** Antwerp – Crowd Monitoring	2	2	1	2	2	2	2	3	16
29	**Spain,** Gipuzkoa Region – Big Data Solution	2	2	2	2	2	2	2	2	16
30	**United States of America,** New York City – Link NYC	2	3	1	2	2	2	2	2	16
31	**Italy,** Florence – Museo dell'Opera interactive visit	2	3	3	1	1	1	2	2	15
32	**United Kingdom**, London – Connected London	2	2	2	1	2	2	2	2	15
33	**Italy,** Ravenna – MyRavenna (platform)	1	2	2	3	1	2	2	2	15
34	**France,** Bordeaux – Cite du Vin	2	2	2	1	2	2	2	2	15
35	**Italy,** Bologna – Open Data Comune di Bologna – Eventi Cultura Bologna	1	2	3	3	1	1	2	2	15
36	**France** – Banque Populaire data portal	1	2	1	2	2	2	2	3	15
37	**Sweden**, Gothenburg –101 sustainable ideas for better tourism	2	2	1	3	1	1	2	3	15
38	**Spain,** Andalucía –Tourism of Tomorrow Laboratory	1	2	2	1	1	2	3	3	15
39	**Spain**, Costa del Sol –Secure Destinations Dashboard	2	2	1	2	1	3	2	2	15
40	**Spain,** Valladolid – STILE (Smartness and Sustainability Evaluation Tool)	3	2	1	2	1	2	2	2	15
41	**Sweden,** Växjö – READY project	2	2	1	2	2	2	2	2	15
42	**Spain**, Malaga – Big Data Tourist Costa del Sol	2	1	1	2	1	3	2	3	15
43	**United Kingdom**, London – Smart London Plan	2	2	2	2	1	2	3	1	15
44	**Austria,** Vienna – Smart Traffic Lights	1	3	1	2	2	3	1	2	15

Rank	Data use	Sustainability	Accessibility and inclusivity	Cultural heritage	Data usage	Innovativeness of the solution	Relevance of technology	Tourists-residents relationship	Stakeholder involvement	Total Score
45	**Ireland**, Dublin – Mobility As A Service (MaaS) program	2	2	1	2	2	1	2	3	15
46	**South Korea**, Busan –TaaS (Travel as a Service)	2	3	1	2	2	2	2	1	15
47	**Japan**, Osaka – Grand Front Osaka - NEC ICT	2	2	1	2	2	2	1	2	14
48	**Spain**, Malaga – Sustainable LED Light Projects	3	2	1	2	1	2	2	1	14
49	**Spain**, Valencia – Valencia MAtchUp Project	2	2	2	1	2	2	2	1	14
50	**Spain**, Palma – Nautical Pole - Ramon Llull Initiative 2030	3	2	1	1	1	2	2	2	14
51	**Spain**, Palma – The Green Belt Project	3	2	1	1	2	2	1	2	14
52	**Canada**, Vancouver – VanDashboard	2	2	1	2	1	2	2	2	14
53	**Australia,** Coogee – Smart Beaches Project	2	2	2	2	2	1	2	1	14
54	**Spain**, Barcelona – Mapping gender in tourist behaviour based on instagram	1	2	1	2	2	3	1	2	14
55	**Spain**, Andalucía – Smart Data	2	2	2	2	2	2	1	1	14
56	**Spain**, Valencia – GO2	3	1	1	1	2	2	2	2	14
57	**Spain**, Madrid – PLUS (Platform for Legacy with us)	2	2	1	2	1	2	2	2	14
58	**Slovakia**, Bratislava – A campaign called “Tourist in one’s own city”	2	2	2	1	1	2	3	1	14
59	**Denmark**, Copenhagen – Copenhagen Card	2	2	1	2	1	1	2	2	13
60	**Slovenia,** Ljubljana – Urbana Smart Card	2	2	1	1	1	1	2	3	13

Source: Author’s elaboration

5.2. Assessment of good practices replicability

The purpose of the compendium of good practices is also to inspire other destinations in adopting smart tourism solutions. Therefore, the study team focused on analysing the replicability potential for all the 30 identified good practices. To this end, a specific methodology was adopted in order to assess the replicability potential.

Out of the 8 criteria used to evaluate data uses, the project team selected the two criteria that together help to describe the feasibility of the data use, namely: i) Innovativeness of the solution and ii) Stakeholder involvement. For all the good practices identified, the two dimensions were evaluated by adopting a Low-Medium-High scale. The table below provides a description of the rationale behind the assignment of the scores.

Table 17 – Approach to replicability potential evaluation

	Replicability potential evaluation scale		
Evaluation criteria	**1 (Low)**	**2 (Medium)**	**3 (High)**
Innovativeness of the solution	The technological solution is completely experimental and it requires research and development activities	The technological solution has already been piloted, but it is not widely available on the market yet	The technological solution is widely available on the market
Stakeholder Involvement	The good practice is characterised by the involvement of more than 3 stakeholders	The good practice is characterised by the involvement of 2-3 stakeholders	The good practice does not involve any stakeholders (in addition to the implementing organisation)

Source: Author's elaboration

The above methodology allowed the study team to obtain, for each good practice, a compounded score made up of the sum of the score assigned to each evaluation criterion. The table below provides an overview of the replicability potential evaluation for all the 30 identified good practices.

Table 18 - Replicability potential of selected good practices

#	Good Practice	Evaluation Criteria		Total score
		Innovativeness of the Technology (score)	**Stakeholder Involvement (score)**	
1	**Sweden**, Gothenburg – Event Impact Calculator	1	2	**3**
2	**Finland**, Helsinki – MyHelsinki Open API	2	2	**4**
3	**Spain** – DATAESTUR	2	2	**4**
4	**Italy**, Venice – Smart Monitoring System	2	1	**3**
5	**The Netherlands**, Amsterdam – iBeaconMile	2	2	**4**
6	**Ireland**, Dublin – Smart Dublin Programme	3	1	**4**
7	**Norway**, Stavangar – KvikktestNordic Innovation	1	2	**3**
8	**Italy**, Florence – Silfi Smart City Control Room	3	2	**5**
9	**Portugal**, Lisbon – Shops with History	3	2	**5**
10	**France**, Grand Chambéry – Open data for eco-tourism	2	3	**5**
11	**The Netherlands**, Aruba – Biometric authentication	2	2	**4**
12	**United Kingdom**, London – Digital LITH	3	2	**5**
13	**Japan**, Kyoto – Sightseeing Comfort Map	3	2	**5**

#	Good Practice	Evaluation Criteria		Total score
		Innovativeness of the Technology (score)	Stakeholder Involvement (score)	
14	**France** – DATA tourisme	3	1	**4**
15	**Spain,** Valencia – Intelligent Tourism Destinations	2	2	**4**
16	**Belgium**, Brussels – Neighborhood walks	3	2	**5**
17	**Argentina**, Buenos Aires – City Smartvel's technology	3	2	**5**
18	**International** – Open tourism for people with disabilities	3	2	**5**
19	**Vietnam,** Ho Chi Minh City – Go!Bus application	3	3	**6**
20	**Spain,** Seville – City Past View	3	2	**5**
21	**Sweden,** Gothenburg – The Knowledge Hub	3	2	**5**
22	**Finland**, Helsinki – Real Time Crowding heatmap	3	3	**6**
23	**Italy,** Lombardy Region – Digital Tourism Ecosystem	3	1	**4**
24	**Germany,** Berlin – Virtual Experiences	3	2	**5**
25	**Romania,** Brasov – Augmented Reality Application	3	2	**4**
26	**Singapore**, Singapore – Virtual City Platform	2	1	**3**
27	**The Netherlands**, Nijmegen – Smart Tourism Management	3	1	**4**
28	**Belgium,** Antwerp – Crowd Monitoring	3	1	**4**
29	**Spain,** Gipuzkoa Region – Big Data Solution	2	1	**3**
30	**United States of America,** New York City – Link NYC	3	2	**5**

Source: Author's elaboration

Finally, based on the total score, the replicability potential of all the good practices analysed was identified, on a 1 to 6 scale, divided as follows:

- **Score 5 to 6**: Good practices scoring 5 and 6 were considered as highly replicable solutions being characterised by a combination of rather available technologies, to be adopted by groups of stakeholders not too large and, therefore, easier to coordinate.
- **Score 3 to 4:** Good practices that obtained a final score between 3 and 4 were considered to have a medium replicability potential. These initiatives show some factors, either on the technological side or in terms of number/types of stakeholders involved, that could hinder their implementation and their potential for replication.
- **Score 2**: Good practices with the lowest scores have a low replicability potential. These practices show critical aspects in terms of innovativeness of the technology adopted or stakeholders involved, either or both (e.g. implementation of cutting-edge/experimental technologies, involvement of a very broad spectrum of stakeholders, etc.).

5.3. Good practices drafting

As a last step of the activities related to the good practices, the study team prepared a compendium including 30 factsheets, one for each good practice.

A standard format was designed and agreed with the European Commission, in order to provide a synthetic, yet comprehensive, description of all the main aspects of the selected smart tourism good practices. While some sections were intended to be in the form of open

text, others were structured to be a set of close-ended options to allow for comparability, according to standard categories adopted in other parts of the study. The sections on 'Purpose areas of data use' and 'Field of application', for instance, were filled-in according to the categories developed for the database of data uses for tourism.

The table below provides the structure of the good practices factsheets that has been subsequently populated by the study team with all the relevant information:

Table 19 - Good practices factsheet structure

#ID | Good practice name	
Geographical area	*Name of the country(ies) and destination(s) involved*
Purpose areas of data use	*One or more of the following:* • *Improve interaction and engagement with the tourist* • *Conduct market analyses and inform decision-making* • *Improve planning and operations of tourism services* • *Increase destination sustainability and accessibility*
Type of data users	*One or more of the following:* • *Tourism destinations and public authorities* • *Private sector – Tourism industry* • *Private sector - Other*

Source of data	*One or more of the following:*
	• *User-generated data*
	  ○ *Textual*
	  ○ *Photo*
	• *Device data*
	  ○ *Geospatial and satellite datasets (GPS, mobile roaming, RFID, Bluetooth, WiFi networks, meteorological)*
	  ○ *Smart city (pollution, traffic, waste, etc.)*
	• *Transaction data*
	  ○ *Web-search and webpage visiting*
	  ○ *Online booking and purchasing*
	  ○ *Consumer card transactions*
	• *Other datasets from public or private entities*
	  ○ *Business information (restaurants, hotels, etc.)*
	  ○ *Statistics*
	  ○ *Context-specific information*

Actors involved	*List of actors involved (both public and private)*
Implementation period	*Year in which the good practice implementation started or was completed*
Context and background *Short description of the context and background of the good practice with focus on the need(s) to be satisfied*	
Solution adopted *Short description of the identified solution in relation to the needs described in the background section, focusing on the technologies adopted and data management aspects*	
Key challenges *Short description of challenges and/or barriers encountered throughout the implementation of the smart tourism solution*	
Impacts *Expected impacts deriving from the implementation of the identified solution (e.g. policymaking, sustainability)*	
Replicability potential *Overall potential for replication of the solution and indication of the replicability factors*	

The completion of all the fields of the good practices structure required additional desk research in order to identify key documents and online sources which could inform the description of each section. A list of key contact persons was also developed in order to collect further relevant information by means of surveys or phone interviews.

The outcome of this activity has been included in the main body of the study, in particular 5 good practices under Section 3, par. 3.3 ‘Good practices’ and 25 as part of Annex A.

6. Analysis of future trends and roadmap to anticipate change

After the analysis of challenges and solutions associated to tourism data uses, the study team focused on the identification and analysis of trends that are likely to deeply affect the tourism ecosystem in the short, medium and long term.

Consistently with the overall approach adopted across the different parts of the assignment, the study team employed a number of data collection techniques, to carry out the analysis of the future trends and develop a roadmap to anticipate change.

The overall approach followed to achieve the desired goals can be summarised in three consecutive stages, progressively analysing relevant information and isolating patterns:

1. **Sources screening:** First the study team analysed the technological, demographic, and policy goals that are currently modelling how the destinations use the available data.
2. **Trends elicitation**: The team identified the relevant trends on data uses according to a three-fold time horizon (namely the years 2024, 2030, and 2050).
3. **Trends analysis and impacts**: The study team addressed how the selected trends could drive change in the entire tourism ecosystem, ranging from companies to destinations.

Following these three stages approach, the team set up the analysis to generate the desired outcome of foreseeing the future evolution concerning data uses in tourism destinations. The output of this activity has been a set of recommendations on concrete actions to be taken by tourism destinations to anticipate trends, matched by a roadmap on future trends.

6.1. Complementary desk research

Further desk research has been performed to complement the previous literature review and the analysis of data uses previously carried out (Section 4). This allowed to identify additional relevant datasets and pieces of literature that could help to list a series of megatrends affecting the tourism ecosystem over different time horizons, drawing a specific roadmap.

This additional research effort and preliminary analysis helped develop an initial list of megatrends to be further investigated and detailed.

The following table includes some of the additional pieces of literature mapped and reviewed in this phase:

Table 20 – Additional sources consulted for the analysis of future trends

#	Source title
1	Badidi, E., & Maheswaran, M. (2018). Towards a Platform for Urban Data Management, Integration and Processing. IoTBDS; M. Knudsen and J. Kaivo-Oja, “Collaborative Robots: Frontiers of Current Literature”.
2	Buhalis, D. and Law, R. (2008), “Progress in information technology and tourism management: 20 years on and 10 years after the internet – the state of eTourism research”, Tourism Management, Vol. 29 No. 4, pp. 609-623.
3	Charlotte van Ooijen and David Osimo, “Unlocking the Hidden Data Pearls in Digital Government Monitoring: Measuring Uptake at the Source,” Co-VAL blog, 07 May 2021. https://www.co-val.eu/blog/2021/05/07/unlocking-the-hidden-data-pearls-in-digital-government-monitoring-measuring-uptake-at-the-source/
4	European Commission, “Commission Proposes a Trusted and Secure Digital Identity,” accessed January 31, 2022, https://ec.europa.eu/commission/presscorner/detail/en/IP_21_2663
5	European Parliament resolution of 25 March 2021 on establishing an EU strategy for sustainable tourism (2020/2038(INI)). 2021, pp. 107–119.

6	Gretzel, Ulrike & Scarpino-Johns, Michelle. (2018). Destination Resilience and Smart Tourism Destinations. Tourism Review International.
7	Nam, K., Dutt, C. S., Chathoth, P., & Khan, M. S. (2019). Blockchain technology for smart city and smart tourism: latest trends and challenges. Asia Pacific Journal of Tourism Research, 1–15.
8	Neidhardt, J. and Wörndl, W. (Eds), Information and Communication Technologies in Tourism 2020, Springer International Publishing, pp. 3-14;
9	Reinhold, S., Zach, F.J. and Krizaj, D. (2017), "Business models in tourism: a review and research agenda", Tourism Review, Vol. 72 No. 4, pp. 462-482.
10	Tsaih, Rua-Huan and Hsu, Chih Chun (2018) "Artificial Intelligence in Smart Tourism: A Conceptual Framework". ICEB 2018 Proceedings (Guilin, China). 89.
11	W. Wang et al. (Novembr/December 2020), "Realizing the Potential of the Internet of Things for Smart Tourism with 5G and AI," in IEEE Network, vol. 34, no. 6, pp. 295-301.

The complementary desk research helped also to inform the setup of an interview round involving tourism experts from the industry and the academia aimed at validating the initial list of trends and at identifying additional ones.

6.2. Round of interviews with selected experts

A number of experts has been consulted through semi-structured interviews, conducted following a pre-developed high-level guide that covered the areas of future trends in tourism. During the interview rounds conducted in the context of the 'Analysis of challenges and solutions for data uses' (Section 4, par. 4.2.2), the study team had already prepared a set of additional questions on future trends, to be asked to interviewees and reported in the following box:

Box 2 – Interviews on challenges and solutions for data uses: additional set of questions on future trends of data for tourism

Depending on the interviewee's expertise and availability, and also on the relative progress of Task 1.3 (Analysis of future trends in the data management of urban tourism destinations), it may also be possible to ask additional questions on the trends of data for tourism.

1. Independent. What trends (in terms of both technology and policy) do you identify that will shape data management of urban tourism destinations in the short, medium and long run?
2. Independent. What are the key enabling technologies, demographic changes and policy objectives that drive this process? Do you envision other key elements apart from those?
3. Independent. In your view, what are the practical implications of these factors on the future of data management?
4. Independent. How do you envisage data helping cities in tourism management in the future?
5. Independent. What new data use cases will be possible?
6. Independent. How do you think destination management organisations and public administrations can anticipate these changes?
7. Independent. What targets can you identify to be attained by destinations on the different timescales, in order to be at the forefront of digital innovation in tourism?
8. Independent. In your view, what are the main obstacles that hinder destinations in attaining these targets?
9. Independent. What do you think are the necessary preparatory tasks and skills that destinations need to undertake to attain these targets?
10. Independent. What are the stakeholders that should participate in the process of fostering data uses for a future green and digital destination management?
11. Independent. How do you think citizens might convey their opinions for properly informing and directing the development of smart tourism destinations?

The interviews conducted as part of the activities of the analysis of tourism future trends were therefore based also on the preliminary evidence collected during the first round of interviews which involved 13 experts from industry, academia and DMOs.

Selection of interviewees

As mentioned above, the following 8 experts were subsequently chosen to be interviewed (type of organisation/expertise in bold) in order to investigate tourism future trends in depth as well as the hypothesis of a roadmap developed by the study team:

- Director at a **state-owned company focused on technology and digitalisation**
- Smart tourism programme coordinator of a **regional tourism board**
- Scientific officer at a **European Union Agency**
- Head of Research and Development of a **European tourism organisation**
- CRM expert of a **DMO**
- Tourism and digital economy research professor at a **university**
- CEO of a **company providing data driven solutions**
- Coordinator at a **national ministry for tourism**

Questionnaire structure

The above-mentioned semi-structured interviews were conducted following a guidance document specifically designed by the study team. The guidance document included an introductory section which described the objectives of the study and the preliminary list of tourism trends – to be presented to each expert at the beginning of the interview – as well as a questionnaire including a mix of independent and dependent questions.

The questionnaire was developed according to the following sections, each one including multiple potential questions, envisaging an overall duration of the interview of approximately 45 minutes to 1 hour:

Table 21 – Questionnaire for semi-structured interviews on future trends in the tourism sector

1. Most important trends related to data management of urban tourism destinations	
-	Could you please present a brief overview of your experience (and if applicable: your organisation's experience), in the field of tourism data management, and/or related fields?
1.1	**Independent.** Considering the trends identified so far and outlined in the introduction: • In your opinion, which trends linked to data management of tourism destinations are the most important in the short term (until 2024), medium term (until 2030) and long term (2050)? (Please select up to 4 trends in total) • For which of these trends, do you have more knowledge/experience? a. Trends of high importance for TD and data management b. Trends for which the interviewee possesses a high degree of knowledge
1.2	**Independent.** Referring to the study preliminary results: Which other important trends do you think are missing to shape data management of urban tourism destinations in the short, medium and long term? Is there any trend that you would remove from the list?
1.3	**Independent.** What actions do you think destination management organisations can take, in order to anticipate trends and changes in the tourism ecosystem? **Prompt question**: Do you think the local government supports enough actions taken by destination management organisations? **Prompt question:** What are the stakeholders that destination managers should involve in the process of anticipating change and preparing to meet the demands sprung from technology and policy trends?
1.4	**Independent.** Overall, how do you think citizens and/or enterprises should be involved in the improvement of policies and experiences related to smart tourism destinations? Which channels and modalities should they use to convey their opinions?
1.5	**Dependent.** Note that the following questions 6 to 11 are linked to each of the most important trends discussed in Questions 2 and 3. As far as possible, please focus on one trend at the time when

	answering them. You may of course focus on the ones where you have more knowledge and experience.
2. Key drivers and expected impact	
2.1	**Dependent.** What are the key drivers behind each of the trends described/discussed in Questions 1.1 and 1.2?
2.2	**Dependent.** How do you think the trends described/discussed in Questions 1.1 and 1.2 will impact on tourism data management of destinations in the future? For example: Which new data uses or business models will be possible? How do you expect data to help destinations in tourism management, in the future?
3. Implications on destinations management – actions and targets needed	
Considering the three different time horizons – short (until 2024), medium (until 2030) and long term (2050) – we would like to learn more about the probable practical implications of these trends on the future of data management for destinations.	
3.1	**Dependent.** What are the necessary actions – and related target levels – for tourist destinations to be at the forefront of digital innovation? **Prompt question**: For example, actions and targets linked to: Human resources, Operations and processes, Implementation of technologies, Policies
3.2	**Dependent.** What are the main obstacles that hinder destinations in reaching these targets? How could these obstacles be overcome in the future?
3.3	**Dependent.** What do you think are the necessary preparatory tasks and actions that need to be undertaken to attain these targets, and by which stakeholder (tourist destination managers, citizens, tourists, firms or institutions)? **Prompt question**: Do you think the local government supports enough actions taken by destination management organisations?
3.4	**Dependent.** What are the actions the EU institutions could undertake to support destinations to anticipate change and address future tourism trends?

6.3. Triangulation of sources, gap analysis and roadmap

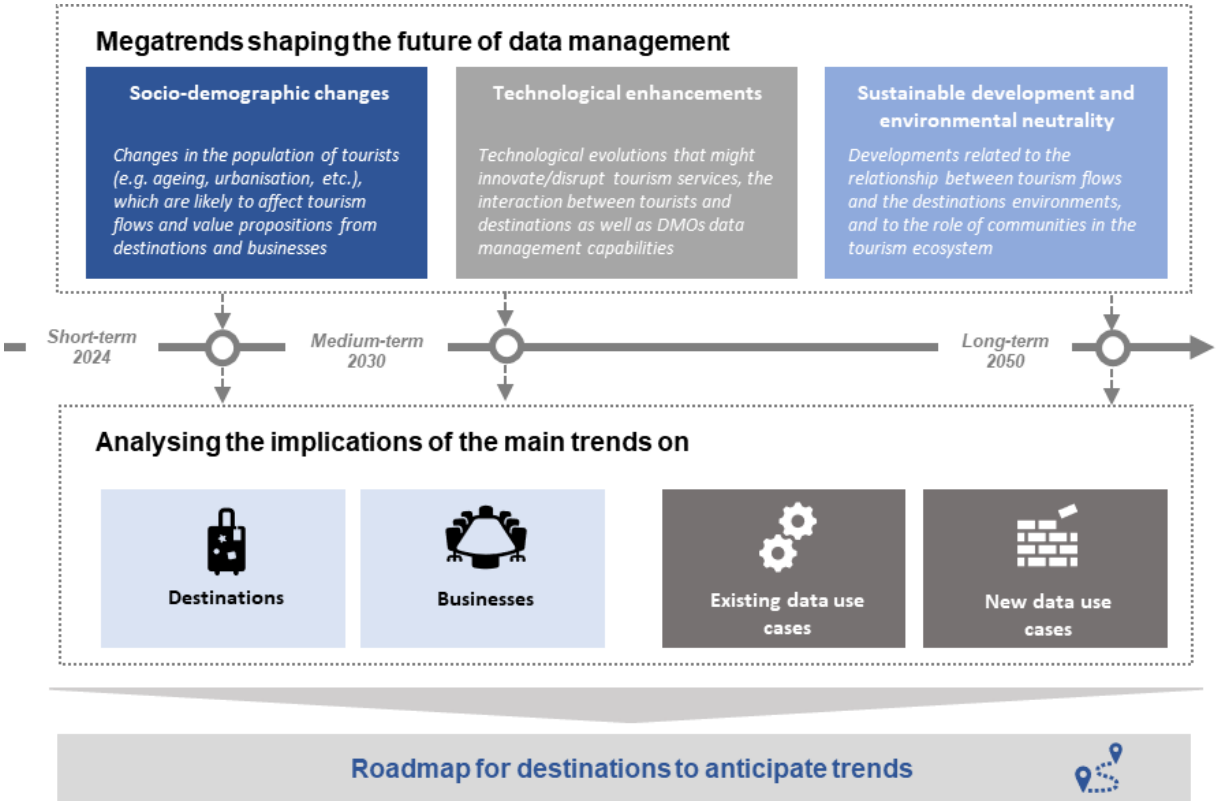
Data triangulation has been applied as often as possible to enhance the reliability and objectivity of the results of the analysis, going beyond the mere analysis of sources and data uses for tourism.

The adoption of a consistent reporting format for all interviews allowed to compare interview outcomes with the evidence emerged from the desk research activity performed and with the preliminary list of trends identified by the study team.This activity helped perform a gap analysis that shed light on the potential actions to be implemented in order to boost the development of Smart Tourism Destinations.

The study team consequently drafted a roadmap on tourism trends and a set of recommendations aimed to provide guidance on how to cope with future developments and trends that are likely to affect the tourism ecosystem.

The following scheme summarises the approach followed to develop the roadmap, and the recommendations derived from the gap analysis.

Table 22 – Approach to the structuring of a 'Roadmap for destinations to anticipate trends'



Source: Author's elaboration

The output of this activity has been included in the main body of the study under Section 4, 'Future smart tourism trends' and in particular par. 4.2 'Roadmap for destinations to anticipate change'.

7. Analysis of opportunities and areas for stronger cooperation on data

The study team conducted an extensive analysis of areas and opportunities for stronger cooperation in the field of smart tourism between destinations.

The output of the activity consisted in 10 factsheets on virtuous smart tourism cases of cooperation among destinations as well as in a set of recommendations and priority actions that destinations should undertake to strengthen cooperation.

The following sections describe the methodology adopted by the study team to conduct the analysis and draft the above-mentioned outputs.

7.1. Selection of case studies of cooperation

The methodology for the selection of the case studies of cooperation follows the same approach adopted for the identification of the smart tourism good practices. Starting from the 200 data uses for tourism collected and mapped in the previous phases of the study, the study team adopted a specific approach to rank and select them (described in Section 3).

Following the above methodology, out of the 200 data uses, a short list of 50 cases was first identified by the study team, as those being most suitable to be presented as good examples of cooperation. Such shortlist has been analysed to better understand opportunities and potential areas of cooperation, collecting information from their websites and secondary sources.

This process led to select 10 of them as the best ones for being included in the final compendium of cases of cooperation, balancing – as done for the smart tourism good practices – secondary aspects such as: i) Location; ii) Extension/coverage of the cooperation and; iii) Duplication. The following table provides an overview of the countries involved in the 10 case studies of cooperation, grouping them according to the number of represented countries.

Table 23 – Geographical coverage of the smart tourism case studies of cooperation

Number of countries involved	List of countries involved	Total number of case studies of cooperation per countries
6 countries	Bosnia and Herzegovina, Croatia, France, Greece, Italy, Spain	**3 cases of cooperation**
	Cyprus, Greece, Italy, Malta, Portugal, Spain	
	Belgium, Croatia, Finland, Italy, Netherlands Spain	
4 countries	Croatia, Greece, Italy, Spain	**1 case of cooperation**
3 countries	France, Ireland, Spain	**1 case of cooperation**
2 countries	France, Italy	**2 cases of cooperation**
	Croatia, Italy	
1 country*	Finland	**3 cases of cooperation**
	Italy	
	Slovenia	
Total number of cases of cooperation		***10***

Number of countries involved	List of countries involved	Total number of case studies of cooperation per countries

**Cases involving only one country relate to cooperation taking place between actors at sub-national level, such as regions, communities of municipalities and cities.*

The final list of smart tourism case studies of cooperation was subject to further in-depth analysis by the study team concerning their potential areas for cooperation on data management. Therefore, the following paragraph reports the findings of the analysis.

7.2. Assessment of case studies of cooperation replicability

Following the same approach adopted for assessing the replicability potential of the smart tourism good practices (Section 4.2 above), the study team adopted a tailored methodology in order to identify how feasible replicating a specific case of cooperation in other tourism destinations would be.

Accordingly, the replicability potential is the compounded result of the analysis of two key dimensions of each case of cooperation, which, as previously described for the good practices are: i) Innovativeness of the solution and; ii) Stakeholder involvement. For each dimension, a three-level complexity scale – 1 to 3 – is applied, assigning the highest value when a dimension has small or no particular complexity and vice-versa. The final result corresponds to the overall replicability potential of the case studies of cooperation – made-up of the sum of the scores under the 2 dimensions.

As a result, each case study was assigned a compounded score from 2 to 6, with the highest scores (5 to 6) identifying cases with the highest replicability potential, intermediate scores (3 to 4) those with 'medium' replicability and the lowest score (i.e. 2) as the cases that are the most difficult to replicate. Accordingly, in the case studies factsheets, these scores are presented in qualitative terms, labelled as 'high', 'medium' or 'low' for easier consultation.

7.3. Presenting smart tourism case studies of cooperation

As done for the presentation of good practices, also for the case studies of cooperation, as a last step, the study team prepared a compendium of factsheets. The compendium includes 10 factsheets of smart tourism case studies, described according to a consistent format agreed with the European Commission.

The template adopted, reflects the one developed for the good practices and made up of a combination of open text fields and others characterised by pre-determined options (e.g. 'Purpose areas of data use' and 'Field of application'). The table below reproposes the structure of the case studies factsheets that has been subsequently populated by the study team with all the relevant information:

Table 24 Cases of cooperation factsheet structure

#ID | Case of cooperation name	
Geographical area	*Name of the country(ies) and destination(s) involved*
Purpose areas of data use	*One or more of the following:* • *Improve interaction and engagement with the tourist* • *Conduct market analyses and inform decision-making* • *Improve planning and operations of tourism services* • *Increase destination sustainability and accessibility*
Type of data users	*One or more of the following:* • *Tourism destinations and public authorities* • *Private sector – Tourism industry*

	• *Private sector - Other*

Source of data	*One or more of the following:*
	• *User-generated data*
	  ○ *Textual*
	  ○ *Photo*
	• *Device data*
	  ○ *Geospatial and satellite datasets (GPS, mobile roaming, RFID, Bluetooth, WiFi networks, meteorological)*
	  ○ *Smart city (pollution, traffic, waste, etc.)*
	• *Transaction data*
	  ○ *Web-search and webpage visiting*
	  ○ *Online booking and purchasing*
	  ○ *Consumer card transactions*
	• *Other datasets from public or private entities*
	  ○ *Business information (restaurants, hotels, etc.)*
	  ○ *Statistics*
	  ○ *Context-specific information*

Actors involved	*List of actors involved (both public and private)*
Context and background *Short description of the context and state-of-the-art and the data mastering capabilities in the destinations involved in each case of cooperation, before the implementation of the smart tourism solution. Needs and areas for improvement were highlighted, in order to understand why a specific solution was adopted*	
Solutions adopted *Short description of the identified solution in relation to the needs described in the background section, focusing on the technologies adopted and main features*	
Reasons for cooperation *Drivers for cooperation among destinations and different public and private actors which would lead to develop common solutions and overcome differences (e.g. in data formats, software interoperability, etc.)*	
Areas for cooperation *Main objectives of the cooperation, to understand the aspects of tourism planning and management where destinations already tend to join forces for developing common solutions*	
Typology of data shared *Datasets and information already shared among destinations, at the basis of the current cases of cooperation and potentially representing a starting point for powering further data sharing endeavours (e.g. data spaces)*	
Approach to data management and sharing *Focus on data management and data sharing characteristics related to the solution adopted, taking into consideration types of data shared and governance aspects*	
Key challenges *Any relevant challenges and barriers, from technology, to legal or business aspects, hindering cooperation and limiting the implementation of the smart tourism solution at the basis of each specific case of cooperation*	
Impacts *A qualitative analysis of the expected impacts deriving from the implementation of the identified solution (e.g. policymaking, sustainability), supported whenever possible by official reports and sources*	
Success factors *Aspects that proved as key enablers in the establishment of cooperation among destinations, at different levels: policy, technology, stakeholders engaged, etc.*	
Replicability potential *Overall potential for replication of the solution and indication of the replicability factors of the case of cooperation*	

The drafting of the final version of the cases of cooperation was informed by further desk research aimed at identifying additional sources. A list of key contact persons was also developed to collect further relevant information by means of surveys or phone interviews.

The outcome of this activity has been included in the main body of the study, 5 factsheets under Section 5, par. 5.2 ‘Case studies of cooperation’ and other 5 as part of Annex B.

7.4. Gap analysis and recommendations

In parallel with the drafing of the cases of cooperation, the study team conducted a gap analysis on the opportunities and potential areas for cooperation on data management in the tourism sector.

The analysis covered the many dimensions included in the case studies factsheets in order to highlight areas where further cooperation is possible or desirable, to strenghten the data economy and foster growth and modernisation in the European tourism ecosystem.

By analysing strenghts but also common points for improvement across the different case studies of cooperation, the study team drafted a short list of recommendations, dedicated in particular to DMOs. The list consitutes a set of advices (some quite practical) that, if followed, can help destinations and their tourism ecosystem to effectively implement data-driven solutions related to smart tourism.

Considering that enhanced data sharing is becoming increasingly relevant in multiple sectors, also cross-sector and cross-border, the study team also briefly analysed possible enablers and opportunties for the setting up of a data space dedicated to the European tourism sector.

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