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Tourism Observatories as an intelligent centre in **tourism planning and management**: The case of A Coruña (Galicia, España)

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Abstract | In the last decade, Big Data has emerged as a great opportunity for the tourism sector, with tourism observatories being an optimal framework for the management and analysis of this large volume of data. This article aims to present and analyse a practical case study related to a tourism governance structure such as the Tourism Observatory of the City of A Coruña. This observatory has been taken as a case study, as the University of A Coruña has participated in its creation and development. The methodology used is mainly qualitative and focuses on determining the categorical variables of presence, use, and scope of this type of tourism management tools, also employing a quantitative analysis with the study of press evolution through the identification of 413 news articles. This research provides an overview of the current situation of these structures in Spain and proposes a model for the optimal creation of observatories, divided into pre-implementation and implementation stages.

Keywords | tourism observatories, tourism management, tourism intelligence, tourism innovation, smart destinations

Resumo | Na última década, o Big Data emergiu como uma grande oportunidade para o setor de turismo, com os observatórios de turismo a constituirem um ótimo framework para a gestão e análise desse grande volume de dados. Este artigo tem como objetivo apresentar e analisar

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um estudo de caso prático relacionado com uma estrutura de governança do turismo, como o Observatório de Turismo da Cidade de A Coruña. Este observatório foi tomado como um estudo de caso uma vez que a Universidade da Coruña participou na sua criação e desenvolvimento. A metodologia utilizada é principalmente qualitativa e foca-se em determinar as variáveis categóricas de presença, uso e alcance desse tipo de ferramentas de gestão do turismo, empregando também uma análise quantitativa com o estudo da evolução da imprensa através da identificação de 413 artigos de notícias. Esta pesquisa fornece uma visão geral acerca da situação atual dessas estruturas em Espanha e propõe um modelo para a criação ótima de observatórios, dividido em etapas de pré-implementação e implementação.

Palavras-chave | observatórios de turismo, gestão do turismo, inteligência do turismo, inovação do turismo, destinos inteligentes

1. Introduction

As an increasingly changing and dynamic environment, it seems necessary that the structuring and definition of tourism policies are consistent with the realities that emerge in tourism. For this reason, it is of utmost importance to take as a point of reference truthful and most up-to-date information possible on the development of tourist activities (Molina e Báez, 2017; Martínez e Cruz, 2023). With such in mind, more destinations are betting on the creation of Tourism Observatories.

Tourism observatories could be defined as tourism intelligence organizations that began to be launched in Europe in the 1980s but that experienced their greatest development until the year 2000 (Molina and Báez, 2017). However, even though one of its missions is to be a stable structure for collecting and analysing data (Blasco e Cuevas, 2013) in order to be able to count a historical series of information that is really useful for the managers, some of them have ceased their activity.

This paper is structured in three phases to comprehensively address the study of the Tourism Observatory of A Coruña and its role in decision-making. Firstly, a review of the presence of tourism observatories in the written media is presented, using the Factiva tool to analyse the scope and focus of the news about these observatories. In the second phase, of qualitative nature, interviews were carried out with social actors involved in tourism in A Coruña, both public and private, to find out the initial situation of big data in the destination. Finally, a

practical phase was developed, where the steps and actions carried out in the implementation of the Tourism Observatory of A Coruña are described.

2. Literature review

Big Data and artificial intelligence are potential tools for the creation of new tourism products, providing unique and original offers based on the interests and the digital footprint that a tourist leaves behind (Xiang et al., 2015; Ivars-Baidal & Vera, 2019). This digital footprint allows for the collection and analysis of large volumes of data from various sources (both primary and secondary). In this way, data monitoring structures, such as tourism observatories, can obtain a more precise and real-time understanding of tourists' preferences and behaviours, which adds significant value to the decision-making process (Fantoni, 2022).

All in all, Big Data and Artificial Intelligence (AI) are presented as a complement to traditional statistics, so this does not imply discarding traditional data sources, but rather generating an ecosystem of data sources through a combination of methodologies capable of accounting for behaviours with greater precision and, a posteriori, projecting and predicting them (Li, et al., 2018; Li, et al., 2020). Thus, thinking about a triangulation of different types of sources can shorten the margins of error in consumer behavioural prediction.

However, there are still certain limitations and/or obstacles to be faced. On the one hand, Brandão and Costa (2008) mention that the available information sometimes presents gaps, temporal breaks, outdated data, is unreliable and is not available in an accessible form or for the destination under study. On the other hand, Scuttari et al. (2023) indicate that this problem may be due to the lack of knowledge about procedures, approaches and instruments for the implementation of evidence-based destination management. With this scenario, Observatories focused on tourism emerge as necessary structures that provide continuous, reliable, useful, contrasted, and transparent information consolidating themselves as a tool for tourism management and planning that facilitates decision-making and the generation of new public policies and implementation of strategies that enable the sustainable development of a destination (Palafox & Segrado, 2008; Brandão & Costa, 2008; Molina & Baez, 2017; Doumet, N.Y. et al., 2023), as well as of the companies within it (Brandão & Costa, 2008; Marco et al, 2009; Quintero, et al., 2018).

In the 1980s, the first Tourism Observatory (from now on TO) was created in France in Cote d'Azur and it was not until the 1990s that the first TO in Spain emerged: the TO of the Canary

Islands (Molina & Báez, 2017). It was in the 2000s when there was a strong proliferation of these bodies, and the UNWTO created, in 2004, the "International Network of Sustainable Tourism Observatories" (INSTO), positioning itself as one of the first to monitor tourism sustainability and encourage networking activities globally (Scuttari et al, 2023). However, despite its early creation, it currently has 44 observatories, 6 of them in Spain.

The diversity of TOs at the national level is evident, manifesting itself through notable disparities in their level of development. Firstly, it is imperative to highlight the existence of TOs that cover different territorial levels, since they are present at the municipal, provincial, autonomous community and even at national levels. Secondly, it is pertinent to point out that WOs at the local level tend to be concentrated in regions where the tourism sector plays a role of considerable relevance, as is the case of the “Benicàssim TO”. Thirdly, observatories that address the tourism situation at the national level tend to focus on a specific tourism product, as exemplified by the “Observatorio Turístico de las Rutas del Vino de España”. However, it should be recognized that, in the boom in the creation of observatories, there are many cases that are either conceived but do not last over time, or simply do not materialize.

In fact, these structures have a number of common characteristics, since they are usually managed by a public entity with the participation of the private and academic sectors (Hortelano & Gil, 2012; Carrera & López, 2013; Hernández & Dancausa, 2016), which helps to make them more dynamic from different points of view. Likewise, they handle diverse data sources (primary and/or secondary) and base their operation on indicators that stand as central components of the process and their monitoring allows for continuous and constant information, as well as foreseeing and identifying in advance the needs and new trends of the sector, thus allowing redirecting tourism policies (Brandao & Costa, 2008; Parada, 2015).

Among the most common sources are supply and demand indicators, sustainability measurements and periodic surveys, among others. This is why collaboration with the private and academic sectors is enriching, in order to build and make these data sources available. At this point, it is worth noting that the most common data sources in national tourism observatories (Spain) are secondary sources, using data provided by public entities (Statistical Institutes) and private entities (generally hotel chains or tourism offices). The statistical data obtained over time can be used for time series comparisons and evolution analysis. Finally, these data are shared for the use by the tourism sector, researchers and the rest of the public through static reports or Business Intelligence tools on a web page, facilitating the interpretation of data and information in real time if required by the situation (Hernández et al., 2023).

The main objectives pursued by TO are to solve the lack of statistical data about a region or destination, to generate updated data sources that allow the visualization of consolidated information on the tourism sector and, finally, to satisfy the need for data on competitiveness, evolution and trends of the destination (Carrera & López, 2013; Hernández & Dancausa, 2016).

Among the advantages provided by the creation of a TO (Bertocchi et al., 2020) is the anticipation of the dynamics of the sector through the use of different sources of updated data, i.e., that predictability provided by the targeted use of Big Data. On the other hand, another advantage is strategic, since it allows us to obtain a global and multidimensional vision of the sector, which is essential to design a competitive business strategy. The information provided is also an advantage that stakeholders can use to support their decision-making processes (Perinotto et al., 2022). Besides that, observatories generate debate among the agents involved, serving as a mechanism for dialogue and consensus among stakeholders and fostering spaces for reflection in decision-making, while citizens are able to keep themselves informed through the available data.

With regard to the structure and functionalities of an observatory, it is worth highlighting the reliability of the information provided, which must come from reliable sources free of bias, reproducibility by ensuring that the data is open, filtering of topics by means of standard topics such as the World Economic Forum's tourism competitiveness index, attractive visualization that allows users to find the information more easily, open access that allows interaction and downloading of the reports, and, finally, legality respecting privacy by making the data anonymous without sensitive or reserved information (Bertocchi et al., 2020). One of the integrating characteristics of TO is the ability to motivate the different sectors of the destination to contribute with information to the network, creating new synergies and promoting equal opportunities in the pursuit of a common interest (Carrera Burneo & López, 2013).

In addition, quality standards linked to the user experience (UX) and accessibility of WEB design must be followed.

In terms of implementation of observatories, Bertocchi, Camatti, and Van der Borg (2020) designed a model to do so - a methodology that was used as the foundation for establishing the TO of A Coruña. This model consists of identifying data sources, assembling the database, designing indicators and measurements together with visualizations and graphics, performance simulations that consist of creating scenarios by adjusting some indicators according to their own criteria and the presentation of new scenarios that are useful for stakeholders.

3. Methodology

This research aims to present and analyse a practical case study related to a tourism governance structure such as the "TO of the City of A Coruña" (Galicia), an urban destination in the north of Spain.

The research, of an exploratory-descriptive nature, has mainly used a qualitative methodology and focuses on determining the categorical variables of presence, use and scope of this type of tourism management tools. Therefore, the data collection techniques have been:

In the first phase, exploratory-descriptive research with mixed methodology is carried out, since a quantitative-qualitative content analysis of news is performed through the FACTIVA $^{(R)1}$ tool. Subsequently, in the second phase, ten interviews were conducted with the main actors involved: regional and local entities linked to tourism in both the private and public spheres. Finally, in the third phase, the steps to be followed for the creation and implementation of the "Tourism Observatory of A Coruña" are described.

3.1. First phase

The FACTIVA$^{(R)1}$ tool was used to search for news about TO, downloading all the news on the same day - February 19th. The aim was to determine and identify the final sample of news about TOs in Spain. With this, other more specific objectives will be achieved:

(i) To identify the stages with the highest volume of news about TOs;

(ii) To determine the national TOs that have a presence in the press;

(iii) To know the status of the news about the "TO of A Coruña".

As seen in Table 1, a search was carried out for the keyword "observatorio turístico" with the search time frame delimited between January 1st, 2022, and December 31st, 2023. Therefore, all the news from these two full years are analysed between March 11-15$^{th.}$ The choice of the keyword was made for convenience since the aim consisted in knowing the diffusion of this term in the sector. Likewise, this period of time was analysed, as it is known from the literature that one of the greatest problems of observatories is continuity over time, and the intention of the study was to identify observatories in operation in Spain in order to examine the current context of reference.

Table 1. Search criteria in the FACTIVA platform

Serch keywords	Applied language	Cohort serch	Total news collected
Observatorio turístico	Spanish	2022 - 2023	1.036

Source: Own elaboration

Likewise, after carrying out the search, a series of inclusion and systematic exclusion criteria were established, determining the following as exclusion criteria:

(i) Publications outside the national scope (Spain).

(ii) Duplicate publications when it is observed that the headline and content are the same.

In the same way, news items were excluded if, even if they belonged to the national scope, they do not refer to tourism observatories understood as a tourism data management tool, as the presence of news items on astronomical and bird observatories that included the term "tourism observatory" (15) and others referring to the termination of the “Logroño TO” (4) was observed (Figure 1).

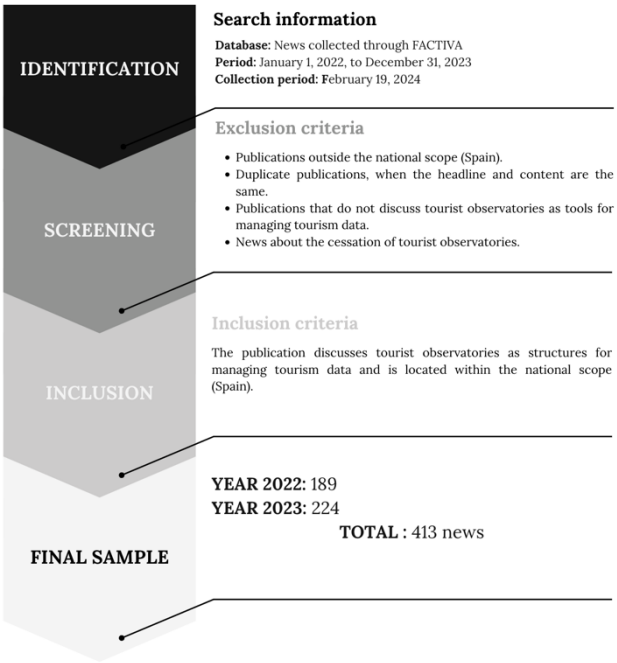

Figure 1. Flowchart of the process to delimit the final sample

Source: Own elaboration

Table 2 shows the methodological process carried out by month and year to determine the final sample for analysis.

Table 2. Methodological process for sample determination

Month	Total news	Duplicated	Outside the scope	Other cases	Sample
YEAR 2022					
January	61	14	22	4	21
February	22	1	12		9
March	25	2	18		5
April	43	8	10		25
May	36	11	6		19
June	53	7	25		21
July	46	10	19	1	16
August	21	2	13		6
September	24	7	7		10
October	47	6	12		29
November	37	12	6	1	18
December	25	4	11		10
TOTAL	**440**	**84**	**161**	**6**	**189**
YEAR 2023					
January	33	3	13		17
February	21	7	6		8
March	140	107	14		19
April	32	4	15		12
May	101	48	11	5	37
June	27	0	14	8	5
July	46	5	19		22
August	32	12	7		13
September	51	8	14		29
October	35	3	19		13
November	55	10	7		38
December	23	4	8		11
TOTAL	**596**	**211**	**146**	**13**	**224**
TOTAL 2022-2023	**1036**	**295**	**308**	**20**	**413**

Source: Own elaboration based on Factiva

For the textual analysis of the published contents, the following variables will be taken into account (Table 3):

Table 3. Variables analysed in the news

Variable	Description
Year and month of publication	The variable year and month will be considered to analyze the evolution of press publications related to TOs.
Medium of publication	The medium of publication will be analyzed to determine which newspapers most frequently mention TOs in their publications.
Physical space	In order to determine the scope of action of the aforementioned TO, the physical space referred to in the publication will be analyzed.
Type of content described	At this point, it should be noted whether the publication refers to the results of TOs that have been set up or, on the contrary, to the intention of creating a TO.

Source: Own elaboration

3.2. Second phase

The methodology involved conducting open and semi-structured interviews with ten social agents related to the tourism sector in A Coruña, Galicia. The interviews aimed to gather detailed information on existing tourism data, data collection and recording methods, and ongoing tourism intelligence projects in the city. The open and semi-structured format allowed for an in-depth exploration of interviewees' perceptions, experiences, and practices, with flexibility to adapt to participants' responses. Interviews were conducted individually to ensure confidentiality and encourage candid expression, with participants selected based on their expertise in tourism to ensure data relevance and quality (see Table 4).

Table 4. Interviews conducted with the agents involved with the tourism sector

Interview	Date	Sector	Code
Tower of Hercules Management	February 2023	Tourism – Public tourism resource manager	TS01
Aquarium Finisterrae Management	January 2023	Tourism - Public tourism resource manager	TS02
Colón Theater Management	February 2023	Tourism - Public tourism resource manager	TS03
Management Casa de las Ciencias	December 2022	Tourism - Public tourism resource manager	TS04
Management Alvedro Airport (AENA)	March 2023	Transport – Public company	TRS01
Management RENFE A Coruña	April 2023	Transport - Public company	TRS02
A Coruña Parking Company	December 2022	Transport – Private company	TRS03
Municipal Bus Company A Coruña	December 2022	Transport – Private company	TRS04
A Coruña City Council Innovation Department	December 2022	Public – City Council of A Coruña	PS01
Mobility Department City Council of A Coruña	December 2022	Public – City Council of A Coruña	PS02

Source: Own elaboration

Given the interest of certain participants in not being recorded during the interview, it was decided to take notes digitally, focusing on recording the main ideas and some key phrases. All these records will be presented in a clear and concise manner in the results section, ensuring a complete understanding of the perceptions and opinions expressed during the study.

3.3. Third phase

The third phase of this study focused on determining the steps to be followed for the creation of the TO of A Coruña, as well as a detailed description of its implementation. To this end, an

action report was drawn up describing the objectives of the tool, each of the phases for its constitution (Figure 2) and the deadlines established for the achievement of each of them.

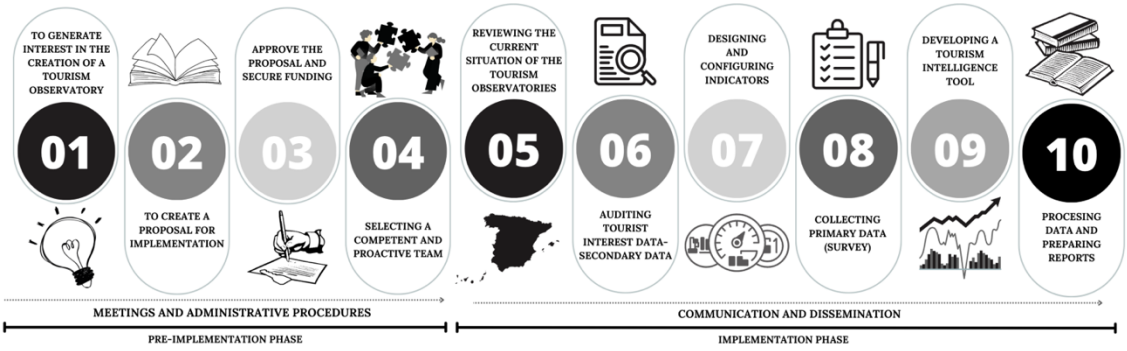

Figure 2. Summary of the steps identified for the implementation of an observatory

Source: Own elaboration

Likewise, based on the financial resources, a detailed description was made in terms of the human and logistical resources required.

4. Results

4.1. The impact of tourism observatories in the press

4.1.1. The presence and evolution

With regard to the monthly evolution of the news in the press about TOs in the years 2022 and 2023, a first view shows a dispersion in the trend since there are months of greater publication about TOs.

In the year 2022, the months with the highest concentration of news occurred in January, April, May, June and July, rising again in October and November, the highest points being April (coinciding with the Easter holiday) and October (after the summer holiday period). On the other hand, in 2023 the months with the highest frequency of news occurred in January, March, May, July, September and November with the highest peak in May (after the Easter holiday) and November (with a high number of news about the TO Wine Routes of Spain and the OT of the Provincial Board of Cadiz). Likewise, it is imperative to highlight that in October 2023 there is the same number of news items as in September 2022 (Figure 3). Therefore, it can be

determined that there are increases in news after the most common vacation periods, such as the Easter and the summer months.

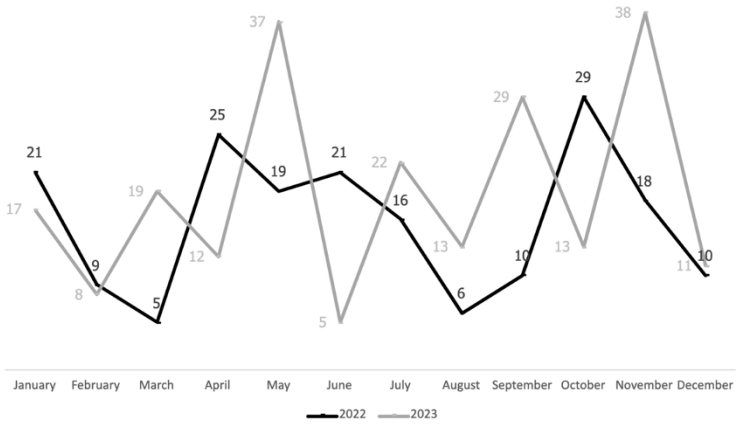

Figure 3. The evolution of tourist observatories in the press (2022-2023)

Source: Own elaboration based on Factiva

As for the presence of the observatories in the press, a total of 70 structures have been detected in different Spanish communities, each of them associated with different types of news that will be analysed in the content section.

Table 5 shows the TOs that have the greatest impact in the press as they are the most cited if the years 2022 and 2023 are added together.

As can be seen, the highest number of news items belongs to the TO of the Provincial Council of Cadiz, which remains constant in its publications throughout the years, since there are news items referring to it for 16 of the 24 months examined, as occurs with the Observatory of Wine Routes of Spain. However, in the latter it is not so surprising, because the news usually reflect results about wine tourism applied to different territories.

Likewise, it is imperative to highlight that many of the news items identified talks about the creation of a TO within the framework of a Tourism Sustainability Plan in Destination (mostly financed by Next Generation funds), a Strategic Tourism Plan or an Action Plan/Director.

Table 5. Tourism observatories with more presence in the press (2022-2023)

Tourism Observatory	2022 N (%)	2023 N (%)	TOTAL N (%)
Diputación Provincial de Cádiz	43 (22,75%)	42 (18,75%)	85 (20,58%)
Rutas del Vino de España	14 (7,40%)	43 (19,19%)	57 (13,80%)
Navarra	13 (6,87%)	12 (5,35%)	25 (6,05%)
Pontevedra – Tourism Sustainability Plan for Destinations	8 (4,23%)	11 (4,91%)	19 (4,60%)
A Coruña	2 (1,05%)	13 (5,80%)	15 (3,63%)
Córdoba	4 (2,11%)	11 (4,91%)	15 (3,63%)
Marbella - Intelligent Tourism Destination Master Plan	10 (5,29%)	4 (1,78%)	14 (3,38%)
Salamanca	6 (3,17%)	6 (2,67%)	12 (2,90%)
Euskadi	8 (4,23%)	4 (1,78%)	12 (2,90%)
Mérida - Tourism Sustainability Plan for Destinations	4 (2,11%)	3 (1,33%)	7 (1,69%)
Granada	6 (3,17%)	1 (0,44%)	7 (1,69%)
Oviedo – Tourism Sustainability Plan for Destinations	1 (0,52%)	6 (2,67%)	7 (1,69%)
Observatories ≤ 6 related news	70 (37,03%)	68 (30,35%)	138 (33,41%)

Source: Own elaboration based on Factiva

4.1.2. The content

TOs play a crucial role in the collection and analysis of data related to tourism activity. Through press coverage, it is possible to observe how these observatories provide valuable information on various aspects of tourism, from general results to specific studies and future prospects. The six categories established in Table 6 were created based on careful reading and detailed analysis of the content of each news item. This process involved identifying recurring themes, keywords, and the main focus of each news item, allowing them to be grouped into coherent and representative categories.

Table 6. Practical classification of news content (2022-2023)

	Results	Studies	Functioning	Creation	Intention	Necesity	Total N (%)
2023	126 (56,25%)	18 (8,03%)	3 (1,33%)	52 (23,21%)	15 (6,69%)	10 (4,46%)	224 (100%)
2022	124 (65,60%)	5 (2,64%)	2 (1,05%)	50 (26,45%)	2 (1,05%)	6 (3,17%)	189 (100%)

Source: Own elaboration based on Factiva

(i) TO data monitoring results:

News related to tourism outcomes analysed using OT provides a comprehensive view of tourism activity in different destinations. The most common indicators include the number of visitors, their geographic origin, overnight stays, hotel occupancy and, to a lesser extent, the motivations driving their trips. In terms of data collection methodology, surveys and the National Institute of Statistics are cited, the latter very frequently in the Provincial TO of the Cadiz Tourist Board.

(ii) Specific studies carried out through the TOs:

News reporting on specific studies conducted through TOs shed light on specific aspects of tourism. Examples include data on MICE tourism (Meetings, Incentives, Conventions and Events) collected mainly by the TO of Salamanca or the TO of Cordoba and sustainability reports prepared by the TO of the Canary Islands. At this point, the tourism news related to the TO of the Canary Islands reflect a great concern for the sustainability of the territory and the reduction of the impact of the carbon footprint.

(iii) Functioning and utilities of the TOs:

News coverage also picks up in fewer cases the functioning and utilities of TOs in the tourism industry. The functions of data collection, analysis and dissemination are highlighted, as well as their role in decision making and strategic planning within the tourism sector. However, it is also worth mentioning a published news item of an interview with the president of the Valencia Hotel and Catering Business Federation, Manuel Espinar (Valencia Plaza, 2023), where he highlights "a TO was created that was useless".

(iv) Creation of a TO based on public funds:

This type of news reports on the future creation of new TOs within the framework of funding initiatives. These news items provide details on the objectives and scope of the new observatories, as well as expectations regarding their contribution to sustainable tourism development. At this point, it is worth mentioning the following TOs that cite the source of funds for their creation:

- Tourism Sustainability Plans: Pontevedra (Galicia), Ribeira Sacra (Galicia), Extremadura, Allariz (Galicia), Granada Geopark, Ribera del Duero Wine Route (León), Balearic Islands, Granada, Goierri (Basque Country), Santander (Cantabria), Puente Genil (Córdoba), Mérida, Los Alcázares (Murcia), El Ejido (Almería) and Puig de Santa María (Valencian Community);
- Strategic Tourism Plans: Valladolid, Zamora, Huesca, León and Murcia;
- Tourism Reactivation Plan: La Laguna (Tenerife);
- Intelligent Tourism Destination Master Plans: San Sebastian and Marbella.

(v) Intentionality of the creation of a TO:

The news coverage also addresses the intention behind the creation of new TOs, however, they are not considered in the previous section, as the news do not indicate that it is backed up by any type of fund, nor that there is an elaborated project. In this area are Puerto del Rosario (Fuerteventura), La Rioja, Castellón and Ibiza.

(vi) Claiming the need for the implementation of a TO:

Finally, there are vindicating news items that underline the importance and the need to establish new TOs. These news items are mainly provided by business associations or opposition political parties. However, it is important to mention the case of Asturias, as a news item in La Nueva España (2022) highlights: "The TO is a demand that we have been asking the different governments for ten years. Now the Principality has presented an initiative that is practically the same thing, although it has a different name...said José Luis Álvarez Almeida" (president of OTEA).

4.1.3. *A Coruña Tourism Observatory in the press*

In the case of the “Tourism Observatory of A Coruña” (from now on OTC), a total of 15 news items referring to the creation of this structure were registered. Of these, eight speak entirely of the city of A Coruña and six of them, of the OTC, while the other seven are in the framework of the municipalities that have been recognized in May 2023 for their management, by the Institute Coordenadas, a national level. In the latter, published in their entirety in Europa Press, only the creation of this observatory is mentioned, so they are not considered for the content analysis of Table 7. For the analysis of the OTC news, categories were established to reflect the content covered in each of them. These categories include: structure (5), where the configuration and organisation of the observatory is analysed; objectives (5), which address the specific goals and purposes of the OTC; studies (4), focused on research and analysis conducted by the observatory; project (3), on the conception and development of initiatives within the framework of the OTC; deadlines (2), which mention deadlines or implementation times; funding (2), which refer to the sources and management of funds; results (4), on achievements and findings; and highlights (1), which highlight achievements or special mentions.

Table 7. Content analysis of OTC news

Date | Press	Title	Content
28 June 2022| La Voz de Galicia	La ciudad contará con un bus turístico eléctrico y señales digitales en la Ciudad Vieja	**Objective:** to improve knowledge of the tourism sector and promote strengths and opportunities and address weaknesses and threats.
20 July 2022| La Opinión A Coruña	El Consorcio convocará un concurso de moda y campeonato de videojuegos	**Structure:** Consortium in collaboration with the University of A Coruña (UDC). **Studies:** analysis, recommendations and predictions on tourism supply and demand.
9 January 2023| La Opinión A Coruña	Investigadores de la Universidad estudiarán los datos turísticos de la ciudad	**Structure:** agreement between Consorcio de Turismo y Congresos, UDC and Fundación Universidade da Coruña (FUAC). **Objective:** to analyze data related to tourist flows. **Deadline:** May 19 to carry out the work. **Project:** work through indicators, with a scorecard and a collaborative and shared tool. **Funding:** €50,000 **Studies:** accommodation, demand, culture and leisure, expenditure, and carbon footprint measurement.
9 January 2023| Europa Press	El Ayuntamiento de A Coruña creará un observatorio turístico en colaboración con la UDC	**Objective:** to analyze data related to tourism flows. **Structure:** Consortium, UDC and FUAC. **Project:** data audit, analysis and organization, among other actions.
9 January 2023| Quincemil	La UDC pone en marcha un Observatorio que analizará los flujos de turismo en A Coruña	**Structure:** consortium, UDC and FUAC. **Deadline:** May 19. **Project:** data audit, control scorecard and collaborative and shared tool. **Funding:** €50,000 **Studies:** accommodation, demand, culture and leisure, expenditure, and carbon footprint measurement. **Results:** integration into a website.
6 March 2023| La Opinión A Coruña	Más de 700 encuestas para leer a los turistas que llegan a la ciudad	**Objective:** to generate data to learn about tourism and make decisions. **- Survey objective:** to know the tourist profile. **Results:** presented in February by the OTC coordinators.
6 March 2023| Quincemil	Observatorio Turístico de A Coruña: Datos en tiempo real, informes y huella de carbono	**Structure:** A Coruña City Council, Tourism Consortium, UDC (University of A Coruña), A Coruña Convention Bureau, HOSPECO. **Highlight:** First municipal observatory in Galicia aiming to become a reference. **Objective:** Real-time monitoring of tourist flows and aiding decision-making. **Studies:** Real-time monitoring, report generation, and carbon footprint measurement. **Results:** Demographic study of demand, carbon footprint measurement at BioCultura and Ecosystems 2030.
25 April 2023 | Quincemil	A Coruña supera los datos de turismo de antes de la pandemia con 34.000 visitantes en marzo	**Results:** The OTC, a project of the UDC, will allow for better analysis of tourism data to implement improvement and effort actions.

Source: Own elaboration based on Factiva

4.2. Starting point for the creation of the OTC

The primary purpose of conducting these interviews was to understand the depth of involvement of these actors and gather detailed information about the current situation based on the existing data and initiatives related to smart planning and management in the city. Close collaboration and a full understanding of the perspective of each involved entity are crucial to

maximizing the effectiveness of the observatory and ensuring its ability to provide valuable and relevant information in the tourism domain (Figure 4).

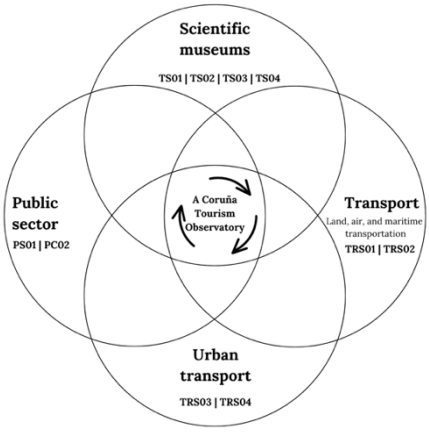

Figure 4. Infographic summarizing the result of the interviews

Source: Own elaboration

4.2.1. Existence of Big Data related to the tourism sector of A Coruña

Based on interviews TS01, TS02, TS03, and TS04, all of them highlighted the temporal coincidence of the launch of the OTC with a technological change mainly focused on online ticket sales, which, once fully implemented, will allow its integration into the tool and facilitate the identification of visitor origins. "This innovation will be essential for obtaining precise data on visitors in real time, including their geographic origin and the duration of their visit" [TS03]. The integration of this new data source will significantly contribute to a comprehensive understanding of visitor patterns and behaviour in these cultural spaces. However, to this day, in-person ticket sales still lack the ability to distinguish the visitor's origin.

In parallel to previous experiences, in interviews TRS03 and TRS04, the issue of reading license plates of vehicles entering the city was addressed. These devices have already been installed. Both private parking control devices and public parking regulation allow for license plate identification, enabling, in conjunction with traffic sources, the inference of visitor origin and duration of stay. However, the current lack of availability to seamlessly integrate with the monitoring system implemented in the observatory is highlighted. Likewise, based on statistics of passengers on tourist routes within the city, it is noted that despite exhaustive records of

ticket sales and transits on all lines, "the inability to distinguish between local and foreign users when boarding the bus/train" [TRS04] constitutes a limitation.

Similarly, it has been identified that those involved in conversations TRS01 and TRS02 possess databases on visitors arriving in the city both by land and air. In light of this, it is crucial to highlight the need to establish a governance structure that allows for the integrated management of all this data.

After conducting these interviews with various relevant actors, the aim is to promote awareness and dissemination of the OTC, as well as establish foundations for future collaborations that facilitate the creation of a shared database. The primary objective of this initiative is to provide a comprehensive view of the destination's tourism situation, which will be crucial for informed decision-making and the design of effective public policies.

4.2.2. Smart projects implemented

Regarding the new smart projects being carried out in the city, the implementation of several initiatives related to the monitoring of ground traffic was addressed.

In this regard, it is noted that, currently, "despite the existence of these units and technologies for the analysis and monitoring of traffic in the urban environment, there is currently no technology available that allows the identification of the origin of vehicles entering and leaving the city until the license plate reading system is fully implemented" [PS01]. Consequently, while it is possible to detect areas or roads with different levels of congestion in real-time, it is not feasible to determine whether this is due to increased tourist influx, the presence of visitors, or local residents of A Coruña.

Following the same line, various projects that have been launched have been studied. These projects are being carried out by the City Council, "which is currently involved and focusing its efforts on making A Coruña a Smart City, as actions based on traffic control and monitoring in the city are being implemented, directed towards license plate reading" [PS02]. In both cases, it represents a great opportunity, as it can provide relevant information for the observatory in terms of understanding the entries, stays, and exits from the city, especially concerning vehicles with foreign license plates. This would open the possibility of obtaining significant data to assess the number of foreign visitors and tourists entering and staying in the city in real-time.

However, it is important to highlight that the project is still in the implementation phase, so there are not enough validated data available for its integration into the observatory. Despite this, the interest in this type of information is considerable, as it could be used to cross-reference data with other indicative sources of the presence of foreign visitors and the number of overnight stays in the city.

4.3. Steps to follow for the implementation of A Coruña Tourism Observatory

In this section, we will address theoretically the creation of the OTC, which was structured into two main stages: the preliminary preparation phase, consisting of four phases, and the implementation phase, consisting of six phases.

4.3.1. *Pre-implementation phase*

In the first phase, the idea of creating the OTC was conceived. As a result of this initiative by tourism experts from academia and public agents, a collaboration emerged between the City Council of A Coruña, through its Tourism and Congress Consortium, and the University of A Coruña for its creation.

In the second phase, academia was responsible for preparing a detailed proposal for the implementation of the TO. This proposal was structured into six different implementation stages, each planned to be executed in specific months (Figure 5), considering that the first phase of the project would span from January 1 to May 31, 2023.

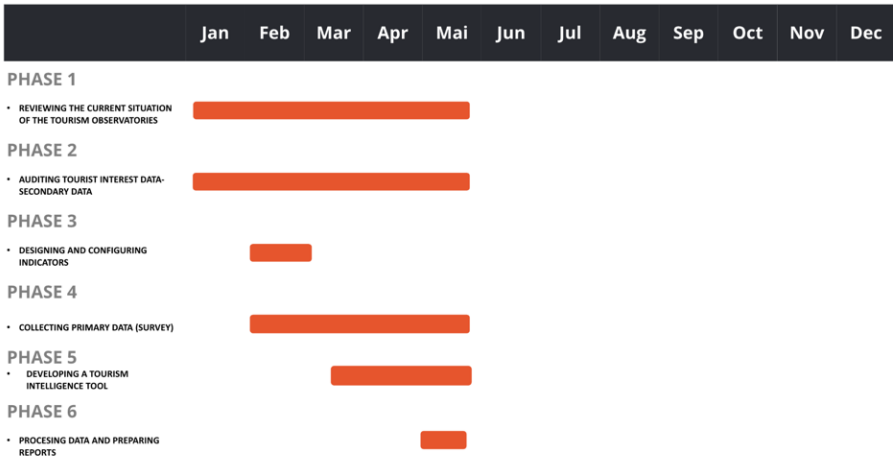

Figure 5. Stages and timeline for the implementation of the OTC

Source: Own elaboration

In the third phase of pre-implementation, the proposal was approved, and a budget allocation from the A Coruña Tourism and Congress Consortium was designated for the creation of the observatory. The implementation and development of the observatory were entrusted to academia. At this point, the fourth phase took place, involving the recruitment of research personnel, configuring the OTC's organizational chart as an entity that actively integrates the public sector through a consortium, the private sector through associations or other related entities, and academia, whose contribution is essential in centralizing information from both spheres and directing efforts through informed studies (Figure 6).

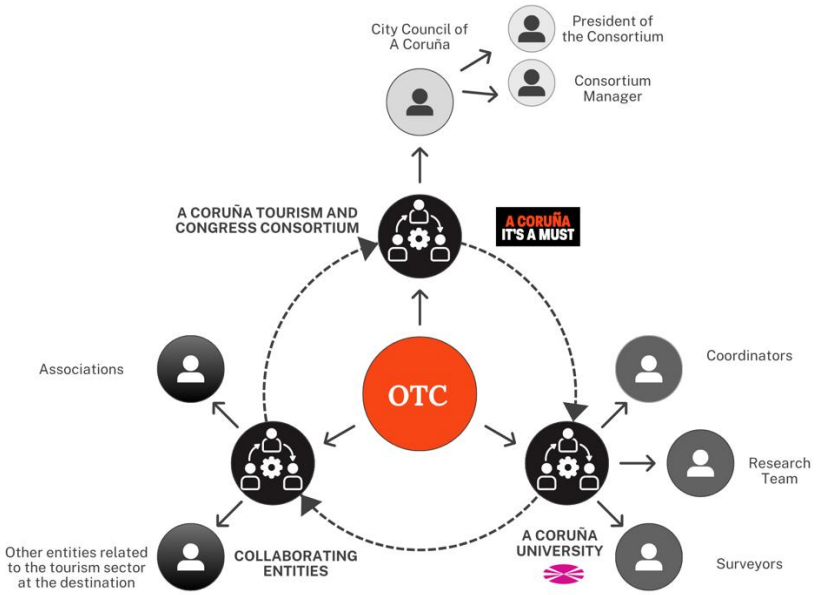

Figure 6. OTC Organizational Chart

Source: Own elaboration

4.3.2. Implementation phase

(i) Reviewing the current situation of the tourism observatories

To achieve the first stage of implementing a TO, it is proposed to conduct a comprehensive study and analysis of the initial situation of TOs in the territorial context of application. As contemplated in a review of observatories in Spain, the structure and level of development of each of them differ, so it is advisable to have successful references to use as benchmarking and establish synergies and collaborations. At this point, the main successful cases identified were the Tourism Observatories of the International Network of Sustainable Tourism Observatories (INSTO) of the World Tourism Organization (UNWTO) (Table 8).

Table 8. Spanish Tourism Observatories affiliated with INSTO

Observatory	Year of affiliation to INSTO	Web	Main areas of monitoring	Principal publications	Real-time data
TO of Navarra	2019	https://www.visitnavarra.es/es/web/turismoprofesional	Accommodation; Tourist offer; Tourist demand; Tourism economics; Resources and hiking; Tourist Offices; The Way of St. James; Air traffic	Annual and half-yearly (last in 2024)	Yes (Tableau)
TO of the Canary Islands	2020	https://www.gobiernodecanarias.org/turismo/estadisticas_y_estudios/index.html	Tourist profile; Cruises; Holiday rentals; Impactur	Annual (last in 2023) and ad hoc studies	No
Sustainable TO of Mallorca	2021	https://stomallorca.com/	INSTO Categories (16); Mallorca 2030 (17); ETIS indicators (4); Frontur; Egatur	Annual (last in 2022)	Yes (Power-BI)
Tourism Intelligence System of Biscay	2022	https://www.visitbiscay.eus/es/web/profesionales-y-medios/observatorio-turistico-bizkaia	Tourist flow; tourist markets; tourism in the counties; public perception; visitor's profile	Annual, monthly (last in 2024) and others (society and tourism...)	Yes (Power-BI)
Sustainable TO of Malaga	2022	https://visita.malaga.eu/es/	Tourism supply; economic impact; visitor and excursionist profile	Annual (last in 2019)	No
TO in Barcelona: city and region (OTB)	2022	https://www.observatoriturisme.barcelona/	Monitoring and Perspectives of Tourism Activity; Profile and Habits of Tourists; Sustainable Tourism Indicators System - SITS OTB; Specialised monographic studies; Online Tourism Reputation	Annual, monthly reports and ad hoc studies (last in 2024)	Yes (Power-BI)

Source: Own elaboration based on INSTO

The main results after a web review indicate that the sources, they use are diverse, including supply and demand indicators, sustainability measurements, and periodic surveys, among others. The statistical data obtained, over time, can be used to make comparisons of time series and evolution analyses that will also facilitate decision-making in situations of uncertainty.

Through a review among the different observatories, it is confirmed that the main tools used are Tableau or Power BI. These platforms operate similarly and function by systematically collecting data in Excel sheets.

(ii) Auditing tourist interest data

In parallel with the previous action, we will proceed with the identification, analysis, and organization of relevant tourism data, in relation to the corresponding territorial delineation of the project, in this case, the City Council of A Coruña.

To do this, all secondary data provided by entities directly or indirectly related to the tourism sector were considered, in order to assess their scope and categorise them according to the relevant criteria for destination tourism planning and management. At this point, the following will be taken into consideration:

- Data generated at the national level by the National Institute of Statistics (INE);
- Data generated at the regional level by the Galician Institute of Statistics (IGE);
- Data generated at the local level by the various tourism agents in A Coruña.

Understanding the status of big data for the tourism destination is crucial. While INE and IGE data are open-access and easily integrated into the observatory, data from local tourism agents require close interaction to assess their databases and integration feasibility. Fieldwork conducted in scientific museums, tourist offices, and municipal departments in A Coruña revealed gaps in key statistical data needed for destination planning, such as visitor motivation and spending. Despite advancements in making A Coruña a Smart City, there is a need to integrate all relevant data to provide a precise and timely view of tourism information from the OTC.

(iii) Designing and configuring indicators

At this point, a governance process becomes necessary where all actors involved in the tourism sector contribute to establishing the indicators they consider most pertinent and relevant. In the case of the OTC, due to the initial lack of knowledge about the main tourism indicators, priority is given to data analysis and information gathering focused on the visitor profile, which acts as the focal point for informed strategic decision-making (Figure 7).

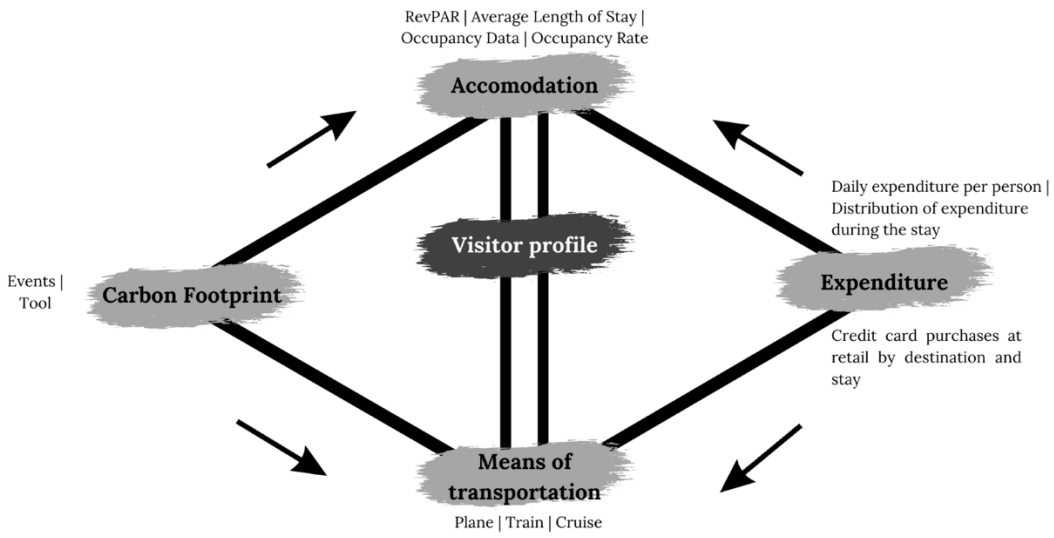

Figure 7. List of OTC Indicators

Source: Own elaboration

This approach is complemented by the selection of key indicators, including carbon footprint, mode of transportation used, expenditure incurred, and type of accommodation chosen by visitors. It is essential to highlight that the development and evolution of the OTC can influence how these indicators are affected, modified, and/or expanded over time, underscoring the importance of maintaining a continuous process of review and updating of the indicators used.

Each of these indicators not only aims to provide relevant information about visitor behaviour but also to establish new relationships and synergies that can be leveraged in future stages of the project. For example, carbon footprint analysis may reveal trends in the sustainability of tourism activities, which could drive initiatives to reduce environmental impact. Similarly, studying the mode of transportation used can offer insights into the region's accessibility and visitor preferences, thereby informing decisions related to transportation infrastructure and urban planning.

(iv) Collecting primary data

Once the indicators are defined, it is crucial to establish the appropriate methodology for data collection. In the case of the OTC, it was determined that the best methodology would be the collection of primary data through an on-site survey, known as a street intercept survey. This survey consists of a total of 17 indicators (Figure 8), which are converted into survey questions

and transferred to an online form using Microsoft Forms. The purpose of this tool is to enable automatic collection of information in an Excel document.

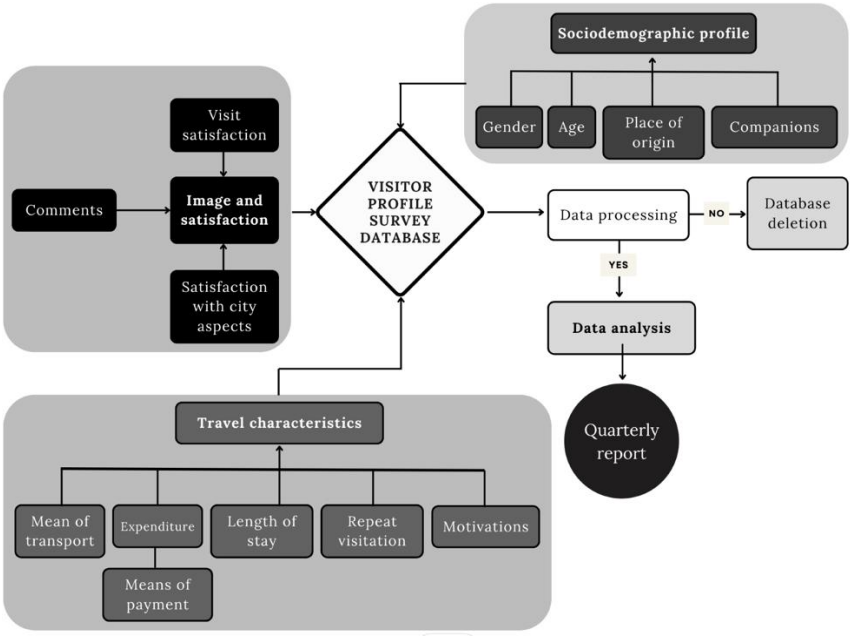

Figure 8. Internal functioning of the survey

Source: Own elaboration

This Excel document, in turn, is linked to the OTC's web platform, enabling real-time visualization of survey results. This technological integration facilitates efficient data management and provides an accessible platform for analysis and interpretation of results by the observatory's managers and other relevant actors in A Coruña's tourism sector (See next section).

(v) Developing a tourism intelligence tool

It is essential that all selected indicators are continuously updated and accessible to the public through a platform. In A Coruña, data analysis revealed a significant shortage of secondary data related to tourism. However, available secondary data has been integrated into the OTC website using PowerBI. Through the National Institute of Statistics (INE) hotel occupancy survey, key indicators such as average stay, occupancy rates, RevPAR, and ADR have been included. A model based on proprietary indicators was developed to analyse variables like

sociodemographic characteristics, expenditure, motivations, and evaluations, providing high-quality information for decision-making. Primary data collection is ongoing, with daily reviews ensuring data accuracy and timely adjustments. The platform's visualizations enable descriptive evaluations that are supplemented with interpretative insights in reports.

(vi) Processing data and preparing reports

Finally, it is worth noting that mere accumulation of data without proper analysis does not constitute true knowledge. In the context of big data, it is crucial to complement the vast amount of data with a deep understanding of the territory in question. This involves considering the geographical, cultural, and social particularities that influence data interpretation. Additionally, it is essential to have a multidisciplinary team composed of professionals with training and experience in relevant areas such as data analysis, statistics, social sciences, and geography. The combination of data, territorial knowledge, and team expertise allows for more precise and meaningful analysis, as well as making informed and effective decisions (Figure 9).

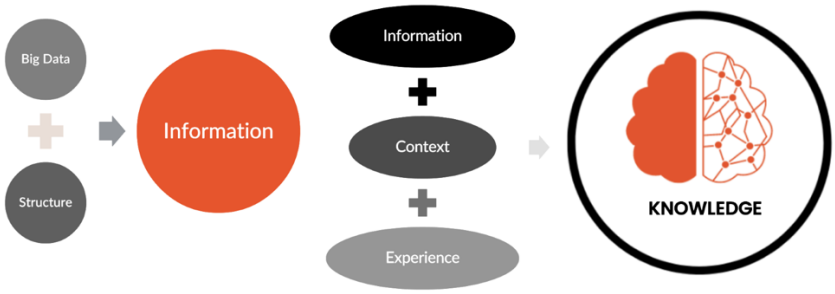

Figure 9. Knowledge generation through Big Data
Source: Own elaboration

In A Coruña, data is analysed and presented in quarterly reports on the sociodemographic profile of tourists and visitors. The report is organized into seven sections: introduction, methodology, results, SPSS analysis, buyer persona, conclusions, and annexes. The results section offers a descriptive analysis of sociodemographic profiles, travel characteristics, and visitor satisfaction, both overall and by survey point, allowing for comparison. The report includes descriptive analysis through PowerBI and deeper statistical analysis with SPSS to explore correlations and provide insights into the data.

5. Conclusions

The analysis of press publications conducted through Factiva has allowed us to identify a total of seventy TOs at the national level, either already established or with clear intentions of creation. Additionally, it has been observed that the periods of higher publication regarding these structures occur after summer, and that such publications mainly focus on the obtained results.

Focusing on the city of A Coruña, it has been witnessed that the creation of its TO has generated a significant impact in the local press, where the objectives, structure, and expected results of the observatory have been mainly mentioned.

Furthermore, interviews conducted with sector stakeholders reveal a widespread recognition of the need for organized and analysed tourism data. Additionally, efforts are being made to transform A Coruña into a smart city, highlighting the importance of the observatory as a central structure to integrate and analyse all this data, thus becoming a complete ecosystem for tourism management.

Finally, the necessary steps for both the pre-implementation and effective implementation phases of a TO are established. This demonstrates that, although they are academically proposed, they have already been put into practice in various contexts, providing a clear guide for those wishing to establish this type of structure in the future.

5.1. Limitations and future research directions

As a primary limitation for the continuation of the OTC project, the need for public funding is highlighted. Despite the evident advantages of the OTC in this initial phase, the short time period has prevented convincing the private sector to provide direct economic support.

Regarding future lines of work, several key areas for the continuous development of the observatory are identified. Firstly, it is crucial to maintain uninterrupted data collection at different tourist points of interest in the city through visitor surveys. This will ensure that the database is always up-to-date and comprehensive, facilitating decision-making and prospecting.

Additionally, implementing a standardized tourist data collection system that can be applied in the city's different Interpretation and Visitor Assistance Centres (CIAVs) is proposed. This will enable more efficient and consistent data collection throughout A Coruña's tourist information network.

Another suggested line of work is monitoring the online presence of the city's tourist resources on various platforms and social networks. This will provide valuable information about the perception and popularity of online tourist resources, which can influence promotion and marketing strategies.

Integrating new collaborating entities into the OTC will not only expand access to different sources of tourist information but also promote the visibility and integration of various actors in the local tourism sector.

Furthermore, integration with other platforms for monitoring and analysing tourist data in the city, as well as with sectoral platforms at the regional or national level, is suggested. This will allow for a broader and more comprehensive view of the tourism landscape and facilitate collaboration and information exchange between different entities.

Finally, considering the potential success of the carbon footprint measurement tool during selected events, expanding this methodology for future implementation in establishments in the city is proposed. This will contribute to the sustainability of tourism in A Coruña and demonstrate the destination's commitment to responsible tourism practices.

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