

BODAH Project Report

The use of New Information and Communication Technologies in the Atlantic Arc for the promotion of tourism and cultural heritage: case studies.

University of Pau and the Pays de l'Adour

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Warning:

This report, drafted within the framework of the BODAH programme, has been prepared in the context of the COVID 19 health crisis from January 1st 2020 to June 1st 2021. The research work was very much impacted by the context of the crisis, which particularly limited movements within the EU countries, especially to the British Isles. The report was mainly compiled through "remote" research, as most institutions were subject to temporary closure or remote working which limited access to documents, or even to the heads of these institutions.

Table of Contents

General introduction	5
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ANGERS

I. Tourism diagnosis	10
A. Network accessibility	11
1) How to get there?	11
2) Getting around the area	11
B. Study of audiences	12
1) The town's tourist offer	12
2) Place of origin of the public and the economy linked to tourism in the town	10
II. ICT Diagnosis	15
A. Visitor support materials	15
B. Communication	16
III. Study of Terra Botanica and the Château d'Angers (Castle)	17
A. Terra Botanica	17
1) Presentation of the site	17
2) Audiences and mediation	17
3) Information and Communication Technologies	18
B. The Château d'Angers	19
1) Presentation of the site	19
2) Audiences and mediation	19
3) Information and Communication Technologies	20
Conclusion	21

BRUGES

Introduction	23
I. Tourism diagnosis	25
A. Network accessibility	25
1) How to get there?	25
2) Getting around Bruges	25
B. Study of audiences	26
1) The town's tourist offer	26
2) Audiences in Bruges	27
II. ICT Diagnosis	30
A. Visitor support materials	30
B. Communication	30
III. Study of the Beer Museum and the Belfry	32
A. The Beer Museum	32
1) Presentation of the site	32
2) Audiences and mediation	32

3) Information and Communication Technologies	33
B. The Belfry	35
1) Presentation of the site	35
2) Audiences and mediation	35
3) Information and Communication Technologies	36
Conclusion	36
SANTANDER	
Introduction	39
I. Tourism diagnosis	41
A. Network accessibility	41
1) How to get there?	41
2) Getting around Santander	41
3) accommodation	42
B. Study of audiences	42
1) The town's tourist offer	42
2) Town's audience	44
II. ICT Diagnosis	45
A. Visitor support materials	46
B. Communication	46
III. Study of the Prehistory and Archaeology Museum of Cantabria and the Fire Road	47
A. Museum of Prehistory and Archaeology of Cantabria	48
1) Presentation of the site	48
2) Audiences and mediation	49
3) Information and Communication Technologies	49
B. Fire road	50
1) Presentation of the site	50
2) Audiences and mediation	51
3) Information and Communication Technologies	52
Conclusion	53
DOURO VALLEY	
Introduction	55
I. Tourism diagnosis	56
A. Network accessibility	56
1) How to get there?	56
2) Getting around the area	56
B. Study of audiences	56
1) The tourist offer of the Douro Valley	56
2) Audiences in the Douro Valley	57
II. ICT Diagnosis	59
A. Visitor support materials	59
B. Communication	59
1) ICT in the Douro Valley territory	59

2) ICT on inventoried sites	60
III. Study of Peso da Régua and the Douro National Park	61
A. Peso da Régua	61
1) Presentation of the site	61
2) Audiences and mediation	62
3) Information and Communication Technologies	62
B. The Douro National Park	64
1) Presentation of the site	64
2) Audiences and mediation	64
3) Information and Communication Technologies	65
Conclusion	65
BIBLIOGRAPHY	69
Angers	69
Bruges	71
Santander	71
Douro Valley	71
ANNEXES ANGERS	71
ANNEXES BRUGES	71
SANTANDER ANNEXES	72
ANNEXES DOURO VALLEY	75

Introduction

This report presents and lists digital "good practices" in certain activities of the "culture sector" and in its use in tourism within the Atlantic area. It therefore seeks to evaluate the use and impact of digital tools from a quantitative and qualitative point of view in the culture sector. In other words, the first step is to assess the use of NICTs (New Information and Communication Technologies) in the development of the heritage of the territories studied and to suggest, on the basis of the expertise carried out, recommendations for the development of certain digital practices aimed at increasing these flows. This work is part of the WP4 task of the INTERREG BODAH (Big Open Data Atlantic Heritage) project.

Four territories were the focus of the study: the Douro Valley in Portugal, the town of Santander in Spain, the town of Angers in France and, finally, Bruges in Belgium. The ambition of the project was to offer a heritage analysis for one territory of each European country of the Atlantic coast. It also aimed at studying different types of heritage (cultural heritage, natural heritage, intangible heritage, and so on.).

At the outset, two limitations to this work should be noted, both of which are unfortunate consequences of the Covid-19 health crisis: no fieldwork could be carried out due to the difficulties and uncertainties of travel and the closure of many cultural sites since February 2020. Similarly, we had to curb our ambition by excluding three sites in the British Isles from this study.

The goal of the BODAH programme, which has been supported since 2018 by the Town Council of Santiago de Compostela (Spain), is inter-European cooperation for the joint planning and better management of cultural destinations, using data and intelligent technologies. In the long term, this project should make it possible to collect, generate, analyse information and offer a diagnosis in order to help make the best decisions in terms of tourism¹ development. The centres studied in this report, under the responsibility of the laboratory of the University of Pau and the Pays de l'Adour (France), allow a particular and in-depth look at these areas. In order to carry out this work, information was collected to create a database for the four sites targeted above. This database lists the tourist sites as well as all the ICT (Information and Communication Technology) modes used by each of these structures. This report provides a qualitative synthesis of the interpretations of the data collected.

ICTs refer to all the telematic fields that allow users to access, store, produce and convey information in different forms: through text, sound, video or interactive graphic interfaces (GUI). These new communication tools have today become not simply a prospective tool, but a real challenge for cultural and tourism policies from an economic point of view as well as from the point of view of enhancing the value of cultural assets.

¹<https://www.bodah.eu/>.

In the course of this work, we briefly reviewed the history of the four sites studied and their relationship with tourism before focusing the analysis on the role of NICTs. This was necessary in order to understand the logic of each case study in terms of cultural and tourism policy.

The case studies in question are :

- Bruges, Belgium
- Angers, France
- Santander, Spain
- The Douro Valley, Portugal

ANGERS (France)

The town of Angers (France), capital of the ancient province of Anjou, cradle of the Plantagenêts dynasty, is a metropolitan area of about 296,000 inhabitants in 2021 (the town centre has about 150,000 inhabitants). It is a medium-sized town located in the Pays de la Loire region, capital of the Maine-et-Loire department, on the communication axis between the Paris area and the Atlantic Ocean. This strategic position of the town (1H30 from Paris by TGV) is a real asset for its development.

Identity card

In addition to its administrative functions, Angers has a fully-fledged university and a real economic dynamism. The economy of Angers is based on historical sectors. With 10,000 employees in 250 companies, the agri-food industry is the leading industrial sector in the department. But the region is above all the **leading horticultural area in France**. Plants are a sector of excellence and innovation. Angers is home to **Végépolys Valley, the world-class competitiveness cluster**. Other areas of excellence in full growth are: **digital technology and the electronics industry of the future**. After a difficult phase in the 2000s, digital industries and start-ups are expanding in Angers, particularly in the fields of **IoT (Internet of Things) and manufacturing**. Since 2015, the region has been awarded the French Tech label. The We Network cluster and the deployment of the Electronics and IoT Technocampus are assets for the digital transition of the region. The town, which was for a long time an industrial area, has also managed to retain some industries, particularly in the car subcontracting sector (the Scandinavian company Scania has its French headquarters there).

The town is very much oriented towards the new century, multiplying experiments, keeping in mind its economic structure. Thus, the social and solidarity economy is highly developed, representing 22% of employment. Similarly, the population is often put to work as a "test town", for the experimentation of "franchises", through its school of agronomy and in partnership with INRAE, **the Grappe laboratory dedicated to the evaluation of the quality of food products**; or even new digital tools via various platforms, in particular the Pavic platform which carries out "Smart Town" experiments

Cultural wealth

Its historic centre, with its many cultural and heritage structures, enabled the town to obtain the label of Town of Art and History in 1986, a status which was

renewed in 2014. It is a town located at the junction of the Maine and Loire rivers, and is the natural outlet for the "Château de la Loire" region, a UNESCO World Heritage site. In addition, the town is surrounded by vineyards of international renown, notably its sweet white wines (Côtes du Layon).

The remains still visible in Angers tell the story of the town since ancient times. The ruins of aqueducts, baths, amphitheatres and ancient roads are a real tourist attraction for the town. The latter, coupled with the medieval heritage, give a glimpse of its history through its streets. Angers experienced strong development from the VIIIth century onwards, thanks to the Counts of Anjou. Indeed, four dynasties of Counts of Anjou succeeded² one another, influencing the architecture and urbanization of the town. Many of these vestiges are still visible today, such as the Hôtel-Dieu Saint-Jean, built at the request of Henry II Plantagenet. This hospital is admittedly one of the oldest in France. In 1232, under King Louis IX of France, the town was equipped with a large fortified enclosure and a castle, which was transformed in the 15th century at the request of the Dukes of Anjou to make it their seigneurial residence. The Great Tapestry of the Apocalypse according to Saint John is also a heritage from the princes of Anjou. This tapestry, commissioned by Louis Ist of Anjou, is today one of the oldest and largest tapestries known in the world, and contributes to making Angers a town with a rich heritage.

Over the centuries, the town established itself as an important cultural and intellectual area, welcoming new institutions such as the Royal Academy of Sciences and Belles-Lettres and a new theatre. In the 19th century, the town hosted numerous art exhibitions and opened new art schools, confirming its place as a cultural and artistic site. That position continued in the 20th century, with a particularly dynamic cultural policy for half a century: the Ministry of Culture created the National Centre for Contemporary Dance; numerous festivals were produced, notably the European film festival "Premier plan"; and a plant museum was opened (Parc Terra Botanica), and so on.

Angers' current development policy involves highlighting the vestiges of the past, but also a new tourism facilities, based largely on new information and communication technologies. The development of these new technologies has effectively changed the way we think about tourism policies. These NICTs can be a real asset in meeting the expectations of the public if they are used correctly. The analysis that we have carried out seeks to highlight the use that the town of Angers has made of them, in order to find out the improvements that could be made.

An innovative tourism policy

The town, capital of the Anjou region, is located in the Val de Loire, an area classified as a Unesco World Heritage Site. Its attractiveness as a tourist destination must also be measured in its wider context. An innovative policy implemented over

² The first was created by Foulque le Roux in 929.

the last half-century has enabled it to be particularly dynamic, often leading the way in the use of new information and communication technologies.

The first asset of this dynamic was the development in 1982 of the [Esthua - Tourism & Culture](#) - component of [the University of Angers](#), which is a reference in terms of training and research on a European scale: with more than 3,000 students, in 2019 it will be the leading European centre for higher education in the tourism sector. New technologies, changes in tourist habits, new ways of experiencing discovery are all being studied: **Angers and its region are a real laboratory for new practices, particularly around the regional [Angers TourismLab](#) scheme**, which promotes the development of research, training and innovation in tourism. This innovation accelerator federates and leads a network of young companies that develop a service or product for the tourism market, created in 2018. In this context, which makes the Angevine town a major innovative space for tourism policy, an [International Tourism Festival](#) has been taking place since 2017, with four days of scientific symposiums, a event for professionals on innovation in tourism, known as the "Tourism Innovation Meetings", and numerous events for the general public. The Festival identifies a "guest country" which is used as the common thread of the edition, in each of its components: academic, professional and general public.

It therefore appears that in the context of the study, the case of Angers appeared to be a promising example.

Tourism in Angers

Network accessibility

How to get there?

Angers' geographical position is a considerable asset, as the town is easily accessible by road, rail and air. It is less than 90 minutes by high-speed train (TGV) from Paris, which makes the development of business and tourism easy. Indeed, Angers is at the crossroads between Val-de-Loire, Paris region and the Atlantic coast. With a dense motorway network, the town is linked to the other major towns of the north-western quarter of France (Nantes, Rennes, Tours). By rail, Nantes is only 35 minutes away and other major cities have a direct link (Lyon, Marseille, Lille in particular *[Appendix 1]*). Angers Loire airport is located twenty minutes from the town and though it is mainly used for freight, you can get business and tourist flights, and it is intended to complement Nantes Atlantique airport.

Finally, Angers has an original tourism tool, the existence of a river port, mainly for tourism. It is located at Cale de la Savatte, is managed by the tourist office of the agglomeration community and it mainly welcomes pleasure boats, which sail in the Loire basin. Recently, cruises to Nantes have been developed.

Getting around the area

The town of Angers can be reached by individual or collective transport. Angers has over 9,500 parking spaces in the town for cars. Vélib' (urban bicycle hire) is available from the station and throughout the town. Public transport consists of thirteen urban and thirteen suburban bus lines to cater for the 1.1 million users who travel around the area every day. A tramway, which has been in service since 2014, will be extended with the inauguration of a second line in 2022³.

Study of audiences

The town's tourist offer

Angers has a strong tourist potential. According to the available data, the town has welcomed between 750,000 and 800,000 visitors each year for the past twenty years. This figure can be explained by the large number of activities offered in the area, the various sites [Annex 2] and the appraisal of the Angers' heritage.

First of all, the town of Angers is characterised by strong urban and business tourism. Numerous sites in the downtown receive the bulk of visitors. One of these flagship sites, the Château d'Angers, welcomed 261,000 visitors in 2019⁴. The tourist offer is completed by various museums, such as the Musée des Beaux-Arts or the Musée Jean-Lurçat. Thus, the town offers varied cultural facilities, made up of museum and heritage structures and numerous events such as the Premiers Plans, Accroche-Coeurs or Soleils d'hiver festivals. The town of Angers has also been able to develop two aspects of its tourism offer *thanks to* the creation, in 2010, of the Terra Botanica park, which welcomed more than 330,000 visitors in 2019⁵. First, this park enables the development of landscape tourism, thanks to the display of 500,000 plants from all over the world, allowing visitors to discover a real plant heritage. Then, it also allows business tourism, notably thanks to the presence of an exhibition hall, an amphitheatre and a conference centre, which make Terra Botanica an ideal place to host trade fairs.

Angers is noticeable nationwide thanks to the classification of Val de Loire as a UNESCO World Heritage site since 2000⁶. This designation is an asset for the region, as it gives it greater visibility. What's more, the town is not only known for its museums and its built heritage. The diversity of tourist activities (water sports, hiking, etc.) also allows the town to attract more tourists. Moreover, with a natural heritage

³ Irigo.com website, *Discover the network* [Online].

⁴ Angers. Frequentation record au château en 2019", *Ouest-France*, 7 January 2020 [online].

⁵ Terra Botanica press release, *More than 330 000 visitors at Terra Botanica in 2019 !* [Online], published on 02 December 2019.

⁶ Website dedicated to the Val de Loire, UNESCO World Heritage site: <https://www.valdeloire.org/>

classified Natura 2000 and the presence of rivers (Sarthe and Mayenne), the territory of Angers offers a varied fauna and flora that tourists can observe through various nautical activities or hiking and cycling⁷. In addition, there are a number of routes to discover River Loire, such as the *Loire de Lumière* walk, which can be done by boat. Finally, as the third largest wine-producing region in France, Angers and its surroundings are also known as an important wine tourism destination.⁸

Origin of the public and the economy linked to tourism in the town

Angers has been awarded the "*Ville d'Art et d'Histoire*" (*Town of Art and History*) label⁹ and was classified as *the greenest town in France*¹⁰ in 2017, thanks to its green spaces and its policy of protecting biodiversity. It also has two tourist offices¹¹. The first, located on Place Kennedy, is open all year round. The second, located at the Maison du Port (a branch of the Tourist Office) is only open during the high season (from April to the end of October). In 2019, the Tourist Office welcomed 178,672 visitors¹², which represents a slight increase compared to 2018 (i.e. 178,037 visitors), but a decrease compared to 2017 (i.e. 180,046 visitors). Of these 2019 visitors, 77% are French and 23% come from abroad¹³. The summer season represents half of the annual attendance of the Tourist Office¹⁴.

Concerning tourist numbers in Angers, we note that in 2019, French tourists coming to Angers are mainly from the Pays de la Loire region and Ile-de-France [Annex 3], in other words from neighbouring territories. They represent half of the visitors. The other tourists come mainly from the middle and north of France,¹⁵ or more precisely from the west of Brittany, between Caen and Rouen, but also from Lyon and Limoges... Foreign tourists are mainly from European countries such as the United Kingdom, Germany, Belgium, Italy, Spain and the Netherlands. However, some of these foreign tourists also come from the United States¹⁶.

The high tourist season is from May to August, while the low season is from November to March (see graph below). One reason for this is that July and August are school holiday periods and the climate is more favourable during this time of the year.

⁷ See the website: <https://www.francevelotourisme.com/itineraire/la-vallee-du-loir-a-velo>

⁸ Source : http://www.angersloiremetropole.fr/fileadmin/plugin/tx_dcddownloads/1.2_diagnostic_appro.pdf

⁹ Awarded the label in 1986. Source : <https://www.culture.gouv.fr/Regions/Drac-Pays-de-la-Loire/Actualite/Renouvellement-de-la-convention-Angers-Ville-d-Art-et-d-Histoire>

¹⁰ Geo.fr website, *What are the greenest cities in France?* [Online], published on 04 February 2020.

¹¹ Tourist Office website available: <https://www.tourisme.destination-angers.com/>

¹² Destination Angers, *touristic activity assessment 2019* [Online], published in 2020.

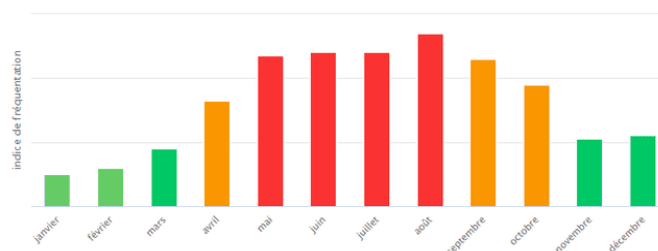
¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ *Ibid.*

¹⁶ Source for the year 2019.

► Graphique : indice de fréquentation de Angers mois par mois



Source : ou-et-quand.net

In 2019, the number of total overnight stays in Angers Loire Métropole (Angers metropolitan area) was 650,347, compared to 623,929 in 2018. This 4.23% increase¹⁷ can be explained by the territory's good tourism dynamics but also by the hosting of several events and congresses at the Convention Hall, since its reopening in May 2019. Nights spent by French tourists increased by 5.33%, for a total of 595,262 in 2019 against 565,104 in 2018¹⁸, while nights spent by foreign tourists decreased by 6.35%, from 58,825 in 2018, to 55,087 in 2019.

Furthermore, the town of Angers accounts for 51% of the hotel capacity of Angers Loire Métropole. Hotels in the town of Angers welcomed a total of 825,376 people, which corresponds to an increase of 26,000 overnight stays compared to 2018, representing 47% of overall overnight stays and 57% of foreign overnight stays in the entire Angers Loire Métropole¹⁹ area. The average length of stay rose from 1.47 days in 2018 to 1.54 days in 2019.

In 2019, tourism represented a turnover of 90 million euros for Angers Loire Métropole, placing it behind Nantes in terms of tourism-related²⁰ revenue. It is equivalent to 42.8% of the total revenue generated in the Maine-et-Loire department, amounting to 210 million euros. Thus, tourism is one of the most important activity in Maine-et-Loire. On average, each year, there are 3030 jobs created in the tourism in the Angers Loire Métropole, rising to 3,720 jobs in high season.

The case of people with disabilities (box)

The town of Angers has set up various actions to facilitate the daily life of people with disabilities, thanks to a proactive²¹ policy. A Handicap Accessibility service has been created, which works in partnership with several disabled people associations. In

¹⁷ Destination Angers, *Bilan de l'activité touristique (Touristic activity assessment) 2019* [Online], published in 2020.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ *Ibid.*

²¹ Source : <http://www.angers.fr/vivre-a-angers/handicap-accessibilite/index.html>

addition, Angers offers a tour, labelled *Tourism and Disability*, the information on which is contained in a brochure produced in partnership with the Tourist Office. This two-kilometre tour makes it easier to get around the historic town of Angers. Signs have been put all along the route. Finally, more and more tourist sites are equipped to make them accessible to all, all year round (aids to visit, adaptation of the route, lifts), eg: the Château d'Angers. Nevertheless, the reality shows the gap between the measures taken and their application. Although the Château d'Angers has adapted tools to assist visitors (such as a Braille panel), the practical accessibility of the site is not at its best throughout the estate. Indeed, although the castle's rooms and the Tapestry of the Apocalypse room are adapted, going from one to the other is not.

The use of ICT in Angers in cultural tourism

Thanks to numerous projects, Angers is said to be a connected town. It uses new technologies to enhance its economy and development. In 2014, the town of Angers was chosen to host the future "Town of connected objects". Another project focuses on the use of new technologies in tourism development: the *Tourism Innovation Lab*, a network created in 2015 to boost tourism innovation. The goals are to encourage the sharing of tourist experiences, and to boost research, training and innovation related to tourism. Thanks to this network, projects have been created such as the AKKEN project, which aims to enhance the value of different tourist locations through immersive and sound-based²² discovery experiences.

VISITOR SUPPORT MATERIALS

The cultural sites of the town of Angers show how aware of the importance of ICT in the world of tourism and culture their managers are. Cultural and other structures have used audio guides, smartphone guides, QR codes, tablets or even film presentations for several years now.

New technologies and virtual reality (such as the 360° observation of the Terra Botanica park) are increasingly used and sought after by visitors. ICTs are now part of our daily lives and are integrated into the strategies of cultural structures. Through immersive shows, special effects, Sound and Light shows, the public discovers new ways of visiting a museum, an exhibition or a monument. It is a new reason for them to go to cultural venues. Indeed, inhabitants and visitors want to discover their museums differently. To make it happen, museums need to offer new activities. ICTs can help by offering new and varied connected activities. In Angers, virtual visits were increasingly offered by the structures. One explanation for this evolution may be the two lockdowns, following the Covid-19 crisis, forcing people to stay at home.

²² PELLEGRIN Hugo, 6 December 2018, <https://www.tom.travel/2018/12/06/a-angers-le-tourisme-innovationlab-mise-sur-un-accompagnement-personnalise-de-ses-startups/>

Indeed, as these virtual tours are accessible on a computer or smartphone, they allow the public to visit a museum or discover an exhibition from home.

To give a more concrete example of the fusion between ICT and visit assistance, we can mention the collections of the Angers Fine Arts museums. Since 2016, these collections have been freely accessible on the Internet²³. This digital approach allows people to contemplate the site in a new way. The catalogue presents more than 42,000 works, i.e. 78% of the collections of Angers' art museums. According to the town, the aim was to provide an illustrated database to help as many people as possible discover Angers' heritage. The aim here was to raise awareness among all audiences through this new digital tool.

Communication



As far as the presence on social media and websites is concerned, the town's institutions still seem to be in transition, even though the majority of the cultural structures in the town of Angers are updating their social media, that have become essential for communication. The cultural structures of the town of Angers mostly use Facebook, Instagram, Twitter and YouTube. Even if their use varies according to the structures, each one makes an effort to be present on them.

Institutions such as the Tourist Office and the Angers Town Council are showcases for the town's tourism offer, as well as important actors in the promotion and enhancement of the town. They therefore have a great responsibility in the way they talk about Angers and its surroundings. These two structures remain active and wish to maintain a link with tourists and inhabitants. With the use of hashtags such as #visitangers or #igersangers, user reposts or information about the town, we notice that this communication channel is not neglected by the town and that it wishes to generate reactions from Internet users.

Having a presence on a website and on social media gives greater visibility and reaches a wider audience. It also allows for interaction with visitors and residents, which is increasingly sought after by the latter, as they check on social media, through bloggers and influencers for example, when preparing their visits or simply for information. Through ICTs, visitors are looking to share their experiences, whether it be through technologies that help them visit or through stories of their experiences.

²³ Portal to the collections of the museums of France:
http://www2.culture.gouv.fr/public/mistral/joconde_fr?ACTION=CHERCHER&FIELD_1=DOMN&VALUE_1=&FIELD_9=MUSEO&VALUE_9=M0748

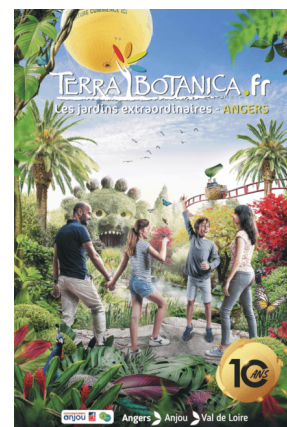
Two examples of the use of ICT: the Terra Botanica Park and the Château d'Angers (a national museum).

Among all the sites inventoried, some stood out in their use of information and communication technologies, notably the Terra Botanica park and the Château d'Angers.

Terra Botanica

Presentation of the site

Created by the Maine-et-Loire department, Terra Botanica opened its doors in April 2010. Since 2015, it has been managed by the Maine-et-Loire department, the town of Angers and the departmental tourism committee²⁴. The twelve hectares of the park track back 600 years of plant history: from the introduction of new species in Anjou by King René to the varieties imported by the great explorers of the 18th century. The park has over 500,000 plants and 5,000 species from all over the world. In addition to helping visitors discover the plants, there is a playground offering some fifty different activities²⁵. There are also ten attractions, including the world's largest blimp. In 2019, the park recorded an increase in attendance of almost 15% compared to 2018, welcoming almost 330,000 visitors²⁶.



Affiche de Terra Botanica, 2020.
©Terra Botanica

Audiences and mediation

The visit of the park is done on ones 'own and the mediators are only present at certain points requiring specific explanations. Terra Botanica offers twelve games and activities scattered throughout the park. These activities range from a giant mascot walking through the paths, to playgrounds for children, to a vegetable garden. Among these activities, the "quiz huts" test the public's knowledge of botany, thanks to touch pads integrated into the setting and furniture. The park also has ten

²⁴ Convention constitutive du Groupement d'intérêt public "Terra Botanica", 19 December 2014, [online] < https://www.maine-et-loire.fr/fileadmin/Departement/Conseil-departemental/grands-projets/GIP_terraborotanica_Convention-Constitutive.pdf>, accessed 30/11/2020.

²⁵ Terra Botanica website, < <https://www.terraborotanica.fr/>>, accessed on 05/11/2020.

²⁶ Press Release, 2 December 2019, [online] < <https://www.terraborotanica.fr/wp-content/uploads/2019/12/Communique-de-presse-Terra-Botanica-Fr%C3%A9quentation-record-en-2019-02-12-2019.pdf>>, accessed 30/11/2020.

other attractions. **One of them, "Terra Virtual Reality", allows visitors to admire the park in 360° thanks to a virtual reality headset.** Similarly, "The Treasure of La Pérouse" is an immersive show using special effects and visual projections to tell a story about the great botanists and explorers of the 18th century. "Extreme weather" is a film that uses **hologram projections** to explain how certain plants manage to adapt to extreme climatic conditions. Finally, **augmented reality** films, using **4D technology**, are also shown in a fitted movie theater twice a day. The park offers a number of tour routes with child-friendly activities and leave the visitor free to organise their visit as they wish.

Terra Botanica does not only offer activities within the park. It also organises events for special events such as "Les printemps de Terra"²⁷. Bringing together enthusiasts, professionals and private individuals for a plant market, a village of craftsmen and a garden sale, this event aims to promote the plant industry (landscapers, horticulturists, and so on).

The park also offers educational workshops for young people and school groups, in partnership with the Ministry of Education and Terre des Sciences (Lan of sciences, Centre of Scientific, technical and industrial Culture, labelled Science and Culture Innovation by the Ministry of Higher Education and Research)²⁸. **This is an interactive tour on a digital tablet** with which they explore the park more independently. An exploration kit is also provided (magnifying glass, binoculars, sketchbook).

The use of Information and Communication Technologies

The Terra Botanica park has a very complete website that provides access to all the information needed to prepare a visit, as well as the activities available²⁹. An interactive map is available, allowing visitors to prepare their visit in advance. Being programmed as responsive design, the site adapts equally well on a computer screen, a tablet or a smartphone. It is available in French and English and gives direct access to the park's various social media. the website appears first on search engines showing it is well referenced, it is thus visible to the greatest number of people.

The park is also very present on social media, even though none of its accounts are certified. Created in February 2010, the Facebook page has over 48,500 subscribers. The publications, which are made almost daily, mainly concern the park's news. Internet users also use this page to give their opinions. These are quite good, with a score of 4.3 out of 5 for a total of 2,157 reviews. As for its Twitter wall, it was created in February 2010 and has more than 3,600 followers. The

²⁷ Terra Spring website: <http://printempsdeterra.fr/>

²⁸ Terre des Sciences website: <http://www.terre-des-sciences.fr/>

²⁹ Terra Botanica website: <https://www.terraborotanica.fr/>

publications are mainly about park news and promotion of upcoming events. The first publication of the Instagram account dates from April 2015 and has 5,500 followers. The publications are a little less regular than those on Facebook and focus more on small details of the park, such as the animals that find refuge there or the plants that are sometimes ignored by visitors. They also run contests using the story system³⁰. The aim is usually to take a picture of yourself with a detail of the park and share this picture on Instagram with imposed hashtags³¹. Using contests helps to improve the visibility of the account on the network. The park also offers solidarity yoga sessions for the benefit of the association "Mécénat Chirurgie Cardiaque". As the last edition could not be held in the park due to the COVID 19 pandemic, it was held on Facebook and Instagram. The number of participants enabled the association to raise over €7,500. The YouTube channel is not directly present on the website but appears in the first search results on YouTube. Created in September 2011, it has 576 subscribers and presents mainly promotional videos but also short videos on current events or learning videos on botany.

In addition, the Terra Botanica website is accessible on several other platforms such as p2p websites presenting what to do in Angers. On review websites such as TripAdvisor or Google, the average rating of the park is 4.5 out of 5 for a total of 8730 reviews. TripAdvisor reviews can also be accessed directly from the park's website.

All in all, the use of new technologies and making them a real tool for its development has become paramount for that place. Not only does it direct a large part of its cultural project by exploiting the innovations most likely to attract the public (virtual reality, augmented reality, etc.), but it also deploys an all-out communication on its website or social media, and is present on related sites. Designed in the 21st century, it is in tune with the customs of the new century and its managers have made it a showcase for modern tourism in the area. The Park's increasing attendance in 2018 and 2019, after less than 10 years of operation, is a sign of the effectiveness of doing so.

B. The Château d'Angers

Presentation of the site

The Château d' Angers, a defensive site since antiquity, is now a national monument managed by the French Ministry of Culture. Famous as the residence of the Dukes of Anjou in the 15th century, it was later used as a prison, garrison and ammunition depot. The castle was transformed into a museum in the 19th century and now hosts permanent and temporary exhibitions. The famous painting of the



Le château
©Caroline

³⁰ Stories are images that are only available for 24 hours. They allow you to interact with your followers through polls, animated images, reactions...

³¹ A "hashtag" is a keyword that makes it easier to find all the messages that refer to it.

Apocalypse is on display. Various tools are available to help you visit: guided tours, discovery workshops and game booklets. It obtained the Historic Monument classification in 1875, and has been managed by the Centre des Monuments Nationaux (CMN) since 2011. In the cultural and heritage field, it is the emblematic historical site of the town of Angers and Anjou.

Audiences and mediation

It is possible to visit the castle and its exhibitions freely. The monument team offers a free booklet to accompany the visitor.

The Château d'Angers also offers free guided tours throughout the year. These tours, whether traditional, narrated or slammed, follow different themes. Private tours are also available on request. The Château d' Angers welcomes groups as well. Twenty-three educational activities are available for pupils from nursery school to high school. They each cover different themes, ranging from architecture to visual arts. It is also possible to book guided tours adapted for people with disabilities.

Finally, the Château offers audio guides in French, English, Spanish, German and Italian as companion to the self-guided tour, which lasts 1 hour 45 minutes. A children's audio guide is also available, but only in French.

Booklets for families are available for sale for the visit.

Visits to the museum are therefore relatively classic, in line with a well-established museography very much in keeping with the museum tradition of the French Ministry of Culture.

Information and Communication Technologies

Managed by the Centre des Monuments Nationaux, the Château d' Angers has its own website but is linked to the CMN network. The page presents all the practical details such as opening hours, access to the monument, as well as the history of the castle or the activities offered. However, the ergonomics are fixed: it can sometimes be complicated to find the information you are looking for among all the tabs and the quantity of information offered.

On social media, the Château d' Angers has its own Facebook page (with 6,357 followers) and Instagram (14,300 followers)³². On the other hand, the Twitter and YouTube accounts, visible from the website, are managed by the CMN, which makes information about the Château d' Angers less visible. As for the Facebook page, created in July 2013, the posts are fairly regular and the team seeks to share

³²It should be remembered that in 2019, Facebook and Instagram were respectively the second and fourth most used applications on mobile in France. See Alexandra Patard, "Étude : le numérique en France en 2020", *BDM*, 12 February 2020. URL: <https://www.blogdumoderateur.com/internet-reseaux-sociaux-france-2020/> Accessed on 13 January 2021.

some new or practical information about the building. With a first publication in July 2016, the Instagram account focuses mainly on the aesthetic side, with photos focusing on small details. This medium makes it easier to stay in touch with their followers by asking them to take challenges or by publishing some of their photographs.

The building has an average rating of 4.5 out of 5 with 13,869 reviews on Google and TripAdvisor, with overall very positive comments.

Two mobile apps, available on Android and iOS, have been created specifically for the Château d' Angers. The first, "The Apocalypse"³³, allows to understand the hanging better and discover its hidden side through videos and interactive images. The application also offers a few games. The second app, "The Walls Speak to You"³⁴, presents the scars that mark the walls of the Castle thanks to an interactive map telling their story. These two apps offer a different kind of visit and show a willingness to use digital tools for individual visit, or even to extend it. However, users complained that they were difficult to launch or that they would switch off in the middle of the tour.

As of 2012, a new animated and immersive film produced by Google Arts & Culture was installed in the tapestry presentation room. On the Google Arts & Culture website, it is also possible to discover the smallest details of three panels of the Apocalypse Tapestry³⁵ thanks to the method of gigapixelisation, allowing access to a tiny detail in very high definition³⁶. Thanks to Google, Google Street View technology has enabled the Château d' Angers to offer virtual tours of certain parts of the gardens, the dungeons, the Gallery of the Apocalypse and the Mill Tower. However, this tool only allows to move around but does not give any specific information. Similarly, the 3D tool of the town of Angers also allows access to certain parts of the castle, without offering any additional explanations.

In total, the Château d'Angers, as a national museum has implemented a two-level museography. It is based on a traditional foundation of on-site visits with long-term communication modes : tours on your own with paper guides, various guided tours, educational mediation or audio guides. However, the museum has made visits more modern by using NICTs for some twenty years now, both for external communication and visit continuations via the website, and through more recent interactive tools. A partnership with Google has enabled to promote the Tapestry of the Apocalypse better. The site is more interactive thanks to apps for tablets and smartphones. It reveals a moderate and cautious use of these tools, as

³³ Link to the "Apocalypse" app on Google Play:
<https://play.google.com/store/apps/details?id=fr.monumentsnationaux.angers>

³⁴ Link to the app "The walls are talking" on Google Play:
<https://play.google.com/store/apps/details?id=fr.monumentsnationaux.mursfr2018>

³⁵ It is possible to discover "The New Jerusalem", "The Myriad Riders" and "The Woman Gets Wings".

³⁶ "The New Jerusalem", Google Arts & Culture:
<https://artsandculture.google.com/asset/la-j%C3%A9rusalem-nouvelle/hOGGwZh02ErPHw>

complements to more traditional modes of visit that are more rooted in museographic practices. Social media are mostly used as tools to communicate with the outside world, for information purposes and to enhance the image of the museum by and for users.

Conclusion

The study of the town of Angers shows that heritage sites considered remarkable because of their national or international labels (UNESCO Natura 2000, etc.), are real political stakes, within a conurbation where the tourist field is essential for economic development. The use of NICTs hence appeared to be at the crossroads of this double phenomenon and therefore an important issue.

Many cultural and tourist operators have taken the lead in technological developments in terms of both communication and mediation. Many of the town's tourist sites have equipped themselves with ICTs, offering various visitor experiences using a variety of tools. The use of websites and social media for communication seems less important. Since March 2020 the COVID-19 crisis has had the effect of highlighting the responsiveness of Anjou sites, which have been able to take advantage of the internet to offer virtual tours and/or live events on social media, which shows a certain responsiveness on the part of site managers.

However, it has been shown that the majority of visitors to Angers are French and come mainly from the Pays-de-la-Loire and Île-de-France areas. This local tourism corresponds to business tourism and urban tourism. *De facto*, visitors are mainly passing through the town, with their stay lasting, on average, less than two days. Thus, the challenge for Angers is to diversify its audience. The important work carried out by the town in terms of mediation and communication is now aimed at a wider national and international, mainly European, clientele. The increased use of ICTs opens up many possibilities for promoting its heritage to foreign tourists. The clever use of the tools that the town has already put in place could enable Angers to make its heritage offer better known.

BRUGES

The town of Bruges is located in the northwest of Belgium, in the province of West Flanders, in the Flemish area. Its geographical location has historically been a real commercial asset, as Bruges is situated halfway between Northern and Southern Europe and is directly connected to the North Sea via the Baudoin Canal. Today, the town covers an area of 138.4 km² and is one of the most important cities in the Benelux as an important European cultural centre. Since 2000, the entire medieval town centre has been a UNESCO World Heritage Site ³⁷, thanks to its many buildings and heritage sites.

The history of the town of Bruges is closely linked to water, which played a major role in its development³⁸. From the Middle Ages onwards, Bruges became a commercial and financial crossroads in the heart of Europe, not least thanks to its port activity. This flourishing international maritime trade enabled the town to grow spectacularly and to become a powerful merchant town. In addition, at that time it was equipped with canals make mobility and the flow of goods easier. The canals also served to protect the town. There were about fifty transverse canals, four of which linked Bruges to the North Sea and to other important cities nearby. This prosperity continued until the 15th century³⁹, the golden age of the town, when trade flourished even more and Bruges became a popular cultural destination, hosting the greatest Flemish primitives.

The decline of Bruges began in the 16th century⁴⁰, when communication with the sea became silted up⁴¹. It was not until 1907 that the town was once again connected to the sea, thanks to the construction of an international port: the port of Zeebrugge. This meant that trade was once again able to develop and Bruges regained its former commercial and cultural image. Today, maritime trade still forms part of the town's economic activities, but the town has also developed the tourist sector, which now plays an active role in Bruges' economy.

Water plays an important role in the tourist development of the town. In the area, tourism initially developed on the coast, particularly around Ostend, which attracted English tourists and then the Belgian royal family during the 19th century, becoming a leading thalassotherapy place. The attractiveness of the coastline also benefits the hinterland and in particular the art cities, of which Bruges is "the jewel"⁴².

Furthermore, boat is one of the means of transport used to get to Bruges. The port of Zeebrugge and the ferry terminal contribute partly to tourism, as many cruise

³⁷UNESCO website, *The historic centre of Bruges* [Online].

³⁸ Website of the Bruges Tourist Office, *A Bruges History* [Online].

³⁹*Id.*

⁴⁰*Id.*

⁴¹*Id.*

⁴²VANHOVE (Norbert), "Belgian coastline", *Men and lands of the North*, n° 4, 1980, p. 55.

ships call there and a dedicated cruise passenger terminal was opened in 2018⁴³. In addition, one of the town's key tourist attractions are its canals. With a picturesque and romantic image, boat trips to discover Bruges are very popular, and five piers allow the various companies to take tourists on a cruise. The latter are highlighted in the communication tools and play a major role in the development of the town. In addition, events linked to water are organised and attract many tourists, such as the "Fête des canaux" during which the lightings are reflected in the water and give the town a magical atmosphere. Moreover, for some years now, the ICTs used by the town, such as its social media and its website, have made it possible to influence the number of tourists and to promote a romantic image of the town, to which the presence of the canals and the banks landscaping contribute greatly.

⁴³VRT NWS website, *New cruise terminal opens in Zeebrugge* [Online], published on 14 June 2018.

Tourism diagnosis

Network accessibility

How to get there?

Bruges, likely the most touristic town in Belgium, welcomed 8.3 million tourists in 2018. It benefitted from its status as "European Capital of Culture" in 2002 to develop its tourist appeal while diversifying its offer, seeking to make room for contemporary art in a town of classical art, marked by its Hanseatic commercial past⁴⁴. Tourism represents 6% of the GDP of Flanders⁴⁵. In order to welcome tourists in the best possible way, the town can be accessed thanks to different means of transport (train, plane, etc.). It also offers an efficient web of public transport within.

First of all, tourists must be able to come to Bruges and then move around the town. Bruges can easily be accessed from abroad thanks to three airports nearby (Ostend-Bruges Airport, Antwerp Airport and Brussels Airport). If you take the three airports into account, there are more than 200 destinations and therefore departure points for potential future tourists. Trainwise, Belgium has a well-developed regional rail network with many possibilities for tourists coming to Bruges. However, it is interesting to note that from an international point of view, the train is not necessarily a viable option. As in France, the international rail network necessarily passes through the Belgian capital, Brussels, making a connection necessary. There is an alternative for international tourists who can easily take the bus to Bruges. From Lorient, Maastricht, Prague and Krakow, there are numerous bus companies that offer trips to Bruges. National and European roads also provide an easy access to the town with Brussels 100 km away and Lille 80 km⁴⁶.

Getting around Bruges

Walking and taking the bus are the main means of transportation. The Bruges railway station [*Annex 1*], located in the southern part of the town's periphery, offers a bus departure every five minutes to inner city, and tickets cost €3. In order to limit road traffic and congestion, cars and tourist coaches are kept away from the historic centre. To encourage drivers to move away from the town centre, the town council offers free parking in areas outside the historic centre. The few spaces in the town centre are located in "blue zones", where free parking is limited to 4 hours between 9am and 6pm⁴⁷. However, driving downtown is not advised, as most car parks are

⁴⁴LUCCHINI (Françoise), "Capitales européennes de la culture. Changer l'image internationale d'une ville", *Les Annales de la Recherche urbaine*, n° 101, 2006, p. 90-99.

⁴⁵ Figures from the Bruges Tourist Office.

⁴⁶Visit Bruges, *Bruges accessible to all map* [Online] < <https://www.visitbruges.be/fr/bruges-accessible-a-tous>>

⁴⁷Visit Bruges, *Bruges accessible to all map* [Online] < <https://www.visitbruges.be/fr/bruges-accessible-a-tous>>

costly. The speed limit is 30km/h and some zones may be difficult to access. Therefore, to get around, there is a wide range of bike rental services, which help to limit traffic. A bike can be rented for a day from around 10 euros. The price may vary slightly depending on the different bike rental outlets ⁴⁸. The town of Bruges thus offers a more ecological and sustainable tourism, and limits the noise pollution produced by cars. Bikes also enable to reduce the flow of tourists in the town, thereby reducing the overcrowding of certain places.

Study of audiences

The town's tourist offer

Since the end of the 20th century, the town of Bruges has been faced to mass tourism ⁴⁹. Bruges inhabitants complain about the number of tourists on the streets and in their living areas ⁵⁰. In response to these complaints, the town authorities have developed various actions to better manage the touristic influx.

As early as 1996, the town council of Bruges tried to find answers to mass tourism, firstly by limiting the number of hotels downtown (just over 100)⁵¹, and in 2002 by limiting the number of holiday homes ⁵². The strategy adopted is to gather tourists in the southwest of the town, in an area connected to the town centre by bus lines and the railway station. Before this, Bruges concentrated these tourist accommodations in the centre. As mentioned earlier, public transport traffic is limited in the town centre. In addition, tourist coaches are only allowed to drive into the town centre to drop off luggage and also tourists with disabilities. Finally, Bruges has an agreement with the port of Zeebrugge. The aim of this agreement is to limit the number of cruise ships, allowing only two ships to dock in the port, as opposed to the four to five that used to be allowed per day.

However, the actions carried out by the town council and the 440 million euro profit linked to tourism have reconciled the inhabitants with tourism. The town centre is also home to a large number of tourist-oriented shops (souvenirs, etc.).

In order to better welcome and inform tourists, the municipality of Bruges has three information offices. The *Zand* information office in the town centre is the most important information point. The second, the *Stationsplein*, is located near the railway station, where tourists arrive. Finally, the last one is located in the Historium, at the Grand Place, the Markt. By dispersing these offices, the town is trying to avoid

⁴⁸ Visit Bruges website, *Bike rental point* [Online] < <https://www.visitbruges.be/fr/verken/fietsverhuurpunten> >

⁴⁹ Businessam website, *How Bruges solved the problem of mass tourism* [Online] < [How Bruges solved the problem of mass tourism - Business AM](#) >

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² *Ibid.*

the concentration of tourists in one area, and to provide them with information by placing these offices in strategic locations, through which tourists must walk by.

In order to fight overcrowding, the town is developing the *Brugge Town Card*⁵³. This card offers discounts at twenty-seven heritage sites and museums in the town for a period of between 48 hours and 72 hours. The card also offers discounts on public transport (parking, buses, trams and bikes) and on town activities (30% for arts and culture centres and boat trips). By purchasing this card for €46, tourists get a free boat trip and a 150-page tourist guide⁵⁴. The purpose of the card is twofold: it is beneficial for small budgets and, as already mentioned above, it helps to limit touristic influx. The limited duration of the card (between 48 and 72 hours) encourages the 1.8 million tourists who stay in Bruges for more than one day to stay for that period only. In addition, the sites listed encourage them to spread out over the town.

In the same way, the town's tourist service has developed six tour tracks to limit the concentration of tourists. Tourists can discover certain heritage sites by taking a tour around a specific theme. Among these six tours, we find a tour on the theme of cinema, series, crafts, antiquity, love or *The White Queen*. Cultural events are also organised every year in the historic centre, such as the Triennial Festival of Contemporary Art and Architecture and the Holy Blood Procession.

Audiences in Bruges

The town of Bruges is located in the most visited region in Belgium. A study conducted by *Statbel* shows that the Flemish region was the most visited one in Belgium between 2015 and 2018, hosting more than 63% of the country's overnight stays.⁵⁵

Nombre de nuitées par région (2015-2018)

	2015	2016	2017	2018
Belgique	38.380.415	36.855.214	38.677.308	41.320.284
Région flamande	24.379.810	23.894.894	24.511.335	26.126.619
Région wallonne	7.557.392	7.749.825	7.830.796	8.200.604
Région de Bruxelles-Capitale	6.443.213	5.210.495	6.335.177	6.993.061

Statbel

⁵³ Ticketbar website, *Discount cards - Brugge Card* [Online] < <https://amsterdam.ticketbar.eu/fr/cartes-de-rduction/carte-brugge-/>>

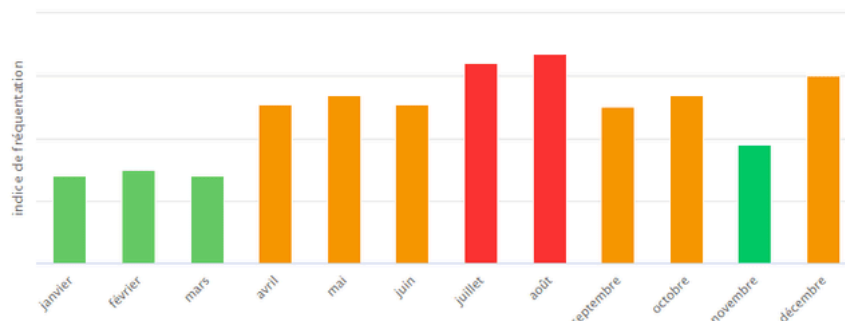
⁵⁴ *Ibid.*

⁵⁵ Stabel website, *Tourism figures 2018* [Online] < [Tourism figures 2018 | Statbel \(fgov.be\)](https://www.statbel.fgov.be/fr/themes/tourisme/figures)>

Between 2015 and 2019, the province of West Flanders recorded 28% of overnight stays, making it the most visited province in Belgium. In 2019, it welcomed more foreign tourists (54.68%) than domestic tourists (45.32%). The most represented countries were the Netherlands (with 1,542,220 tourists), then France (with 1,122,768 tourists) and finally Germany (with 952,461 tourists)⁵⁶. The majority of foreign tourists therefore come from neighbouring countries. This tends to put the international character of Bruges tourism into perspective: the majority of visitors are foreigners, but from nearby countries. The Bruges Tourist Office states that foreign tourists mainly make long stays (one day and at least one night). In 2018, of the 1,107,028 tourists who spent at least one night in Bruges, 907,973 were international tourists and 199,055 were Belgian tourists. The three most represented nationalities overlap with those above: Bruges was visited by 302,186 Dutch tourists, 357,710 French tourists and 340,381 German tourists in 2018⁵⁷. Then, it is obvious that Belgian tourists prefer short stays of one day or even a few hours, hardly surprising given the size of the country. In 2018, of the 5,950,577 short-stay tourists, 3,347,198 were national and 2,603,379 international⁵⁸. In this particular case, tourists are mainly national because it is easier for them to return home once they have visited the town.

Tourist numbers vary over time, concentrated in the summer period (mainly July and August). However, there is also an increase in the number of visitors in December.

► Graphique : indice de fréquentation de Bruges mois par mois



Another difference between domestic and foreign tourists is noteworthy: as we saw earlier, Belgians mainly make short stays and rarely stay overnight. In 2019, tourists in Bruges in that case came more frequently in the months of October, November and December. During that period, there were around 1,652,940 tourists. Tourists from neighbouring towns mainly visit the town in that period. Conversely, the majority of long stays are made during the summer period, with 328,643 tourists⁵⁹. This is due to the relatively pleasant climate of the season and the events scheduled.

⁵⁶SiteToerismeVlaanderen, *Tourism in figures 2019 XL* [Online] < [Tourism in figures 2019 XL | ToerismeVlaanderen](#)>

⁵⁷ Figures from the Bruges Tourist Office

⁵⁸ Figures from the Bruges Tourist Office

⁵⁹ Figures from the Bruges Tourist Office

The local public, for their parts, favours the autumn and spring seasons because the town is less invaded by the flow of tourists and the weather is milder than in winter.

ICT Diagnosis

Visitor support materials

Today, Information and Communication Technologies (ICT) allow to respond to an increasingly important demand in the world of tourism and heritage. Visitors want to discover "differently" and live a real experience by getting out of the straitjacket of the so-called classical visit where they are mere observers of the works. However, it should be pointed out that these technologies, such as virtual tours, should not replace human contact, as many people also wish to be free from the screens during their visits.

Bruges Tourist Office, the showcase of the town and its surroundings, offers a 360 degree tour of Bruges on its website. It allows to discover the town with high-definition pictures and see details of various cultural and heritage sites. It allows to discover the "Venice of the North" from a new angle: the digital one. Tourists can thus prepare their visit in advance, but also discover the town from home which makes it more accessible to as many people as possible.

The Groeninge Museum is also accessible on the Internet. With more than 100 digitised works of art, the museum can be experienced from home. This activity is increasingly used by museums and has become more popular since the Covid-19 crisis, which forced people to stay at home for several months in 2020.

The structures studied in Bruges seem to have understood the importance of ICTs and in particular how paramount it is to integrate them into the visitor support materials. The structures are visibly still in a transitional phase: a phase where digital technology is increasingly present but not yet anchored in each structure. Bruges still has many points to develop in terms of the use of technology. In studying the various structures in the town, we notice a significant gap in terms of the use of ICT in visitor aids. This is the case for the Belfry, which offers very little in the way of digital tour, apart from a few projections on screens in the exhibition rooms, which are proving to be less and less up-to-date. The Historium, on the other hand, is very advanced in terms of ICTs, notably with the use of augmented reality, Google glasses and the implementation of apps to discover the town.

Communication

One of the most important points, for communication strategies, are social media. These have almost become an essential means of communicating about one's region, town, structure, etc. They allow to be visible on a regular, almost daily basis, to a growing number of users of all ages nowadays. Users can interact with them, like and comment on photos, and



keep up to date with news. Social media are a simpler and more instinctive way of interacting than going to a website, which is why it is important to know how to use them.

Visit Bruges, the official website of the town's tourist office, seems to meet the current expectations of internet users. It is available in several languages, is user-friendly, complete and links to social media: Facebook, Instagram, Twitter, Youtube and Linkedin. With approximately 45,000 subscribers on Facebook and Instagram, the tourist office could implement new communication strategies, notably by being present on social media, bringing visibility and more spontaneous interaction with inhabitants and visitors. For Google ranking, the official Bruges tourism website is in fourth place (after Wikipedia, TripAdvisor and Generation Travel), which is still a fair ranking given the number of results that can be found on Google.

Review sites, such as TripAdvisor, provide extra visibility and many people use them to prepare their visits. In the case of Bruges, TripAdvisor is the first site that appears in Google results when people search for the town. This explains why it is important for cultural, accommodation or catering facilities to be well rated by internet users and visitors, who often rely on the ratings and reviews of other internet users who have visited the town.

Bruges cultural structures are present on most social media such as Facebook, Instagram, Twitter and Youtube, although there are some disparities. Indeed, we can take the example of the Belfry and the Historium. They are at opposite ends of the spectrum in terms of the use of ICTs, both in terms of visit materials and the use of social media. The Belfry is not present on any social media and only offers a few film screenings during the visit. Yet it is one of the most visited monuments in the town. We can explain this by the fact that it is on a central and unavoidable place, and thus, the presence on social media is perhaps not of particular interest, even if it would not be counterproductive. The Historium, on the other hand, in addition to having its own website, is present on numerous social media such as Facebook, Instagram, Twitter and Youtube. This presence allows the Historium to keep its visitors informed and to make the site known. We can say that being active on these social media cannot have a negative aspect if they are managed in a professional way and are always a step towards a better visibility. However, it seems premature to conclude that ICTs contribute to increasing the number of tourists.

Study of the Beer Museum and the Belfry

The Beer Museum⁶⁰



Presentation of the site

The Bruges Beer Museum tells the history of beer and introduces visitors to the unique fermentation methods and brewing techniques used in Belgium. Opened in 2014, the museum focuses on Bruges' brewing past and its *gruut*, a subtle blend of spices that is specific to the town. The exhibition focuses on Belgian beer and also beers from 32 countries, with more than 3000 bottles and 500 cans. The slogan "The Beer Experience, discovering and tasting"⁶¹ emphasises the interactive aspect of the visit. The museum is located on the edge of the Grote Markt, in the middle of historic Bruges, but we could not find any specific information about the museum building. The Beer Museum is privately run and supported by the town of Bruges, the province of West Flanders and Tourism Flanders.

Audiences and mediation

The museum offers a sensory experience through the ingredients used: malt, hops, grist and barley. A digital pad is given to visitors at the beginning of the tour. It provides information throughout the visit on the history, production and composition of beer. Headphones and tablets allow visitors to follow the tour at their own pace, in an interactive way, by scanning the codes throughout the visit. This device can be a bit of a pain when it is crowded. Films, experiments, interactive and sensory activities break the traditional museum codes. Interactive games are present throughout the visit. Audio guides are also available at the reception desk and are included in the price. The price of the entrance ticket ranges from €10 to €16 depending on whether

⁶⁰ Photo of the Bruges Beer Museum, taken from "Solent Richard's Cruise Blog": <https://solentrichardscruiseblog.com/2015/06/15/one-way-to-do-bruges/>

⁶¹ *The beer experience, discovery and tasting*

or not you take the tasting option. In both cases, the offer of mediation tools is really qualitative and affordable. They are available in ten languages such as German, English, Chinese, French and so on. This illustrates the museum's desire to address an international audience as well, and not just the local public.

The "Kids tour", designed for children (5-12 years old), allows them to explore the museum in a playful and educational way. It is a short story about Bruges beer that can be read or heard in ten languages. An adventure is presented to them, through the character of "The Bruges Bear", which is the symbol of the town. For children over twelve years of age, a special excursion programme, to be done in groups, is available through various multidisciplinary educational formulas. The main policy of the museum is to have fun while learning. A quiz is also offered to enhance interactivity.

Tastings are also possible. A reservation service is available to block slots for different events such as birthdays or company parties. Several activities are offered, such as an introduction to *food painting*, which teaches drinks and food pairing, and beer tasting ⁶². The museum also has a bar and a shop in addition to the numerous services. In terms of accessibility, the museum offers a visit in sign language thanks to an iPad and an audio splitter for blind and hearing-impaired people.

The feedback from the public studied through TripAdvisor and Google seems rather homogeneous. The museum is rated 4/5 stars on TripAdvisor and 4.4/5 stars on Google with 1770 and 2766 reviews respectively. There are recurring laudatory reviews about the experiences offered, the equipment, the features and the tasting of the three beers at the end of the visit. The most popular features were the quizzes, the games and the tablets, although the public did point out some drawbacks. Some comments suggest that these devices take up too much space on the tour. Nonetheless, interactivity is perceived as an asset of the visit.

Information and Communication Technologies

The Museum of Beer takes an in-depth approach to information and communication technologies. It has its own website with a real work to make it user-friendly, around the headings and links to social media, contacts and other elements of information.⁶³ There is a lot of information on disability accessibility and museum policies.



⁶² Food painting. From the art movement "Food Art".
<https://blog.tramier.fr/food-art-courant-artistique-recettes-tramier/>

⁶³ Screenshot of the website: <https://mybeerexperience.com/fr/experience>

However, the site is lacking information on the content of the devices. The museum makes extensive use of its social media. The Facebook page, formerly called Bruges Beer Museum and then renamed Bruges BeerExperience in 2016, was created on May 1st 2013, i.e. before the museum opened. The number of subscribers is 9,119, with 40,000 stating they have visited the site. When studying the page, it is noticeable that the institution emphasises the idea of an experience rather than a museum. In addition, the numerous memes about beer and aperitifs seem to demonstrate the structure's desire to popularise beer culture, unlike the *in situ* devices which aim to inform the visitor about beer. On Instagram, with 1,696 followers and 269 publications, the museum is developing its image and a certain visual.⁶⁴ The various photos shared generally represent the structure, the devices, beers, the view of the Grand Place or photos of the community. It reinforces the link of transversality and proximity between the visitors and the museum. Conviviality is the key word. Untappd is also one of the museum's social media. Less well known than the previous ones, this social media aims at discovering and sharing new beers and bars. The Beer Museum is not a member, but a tasting point. The unexpected use of this network shows that the institution is turning to a network of people who are new to beer tasting.



⁶⁴Screenshot from Instagram account: <https://www.instagram.com/brugesbeerexperience/>

The Belfry⁶⁵



Presentation of the site

Built between the 13th and 15th centuries, the Belfry of Bruges is an 83-metre-high tower in Gothic style, with 366 steps to the top. During the Middle Ages, it was the top of the market halls where sellers and craftsmen traded and negotiated. The second floor housed the town's vault and records. Trade played a central role in the town's economy at that time, and the Belfry still illustrates Bruges' urban autonomy today. Its location also plays an important role, as it is in the heart of the town, on Bruges' central square, the Markt. Bruges Belfry is undoubtedly one of the most important tourist attractions in the Flemish town. From the top of the Belfry you can enjoy a breathtaking view of the town. Inside, you can also discover the treasure room where the charters, the seal and the town's coffers were kept during the Middle Ages.

During the visit we can see the musical roll, which operates a carillon with 47 bells, and its keyboard. Although the carillon is automated, the town still has its own chime artist.

Audiences and mediation

An audio guide is available in about ten languages. Some exhibitions are equipped with slide shows on digital screens. Due to its many steps, the Belfry is not accessible to reduced mobility people. The latter can get a first impression of the structure of the Belfry thanks to a tactile model, which is located on the Markt square. This allows them to see or touch certain details of the structure and thus to

⁶⁵ Photo of the Belfry of Bruges, taken from the Michelin Guide: <https://travelguide.michelin.com/europe/belgium/flanders/west-flanders/bruges/belfry-and-covered-market-bruges>

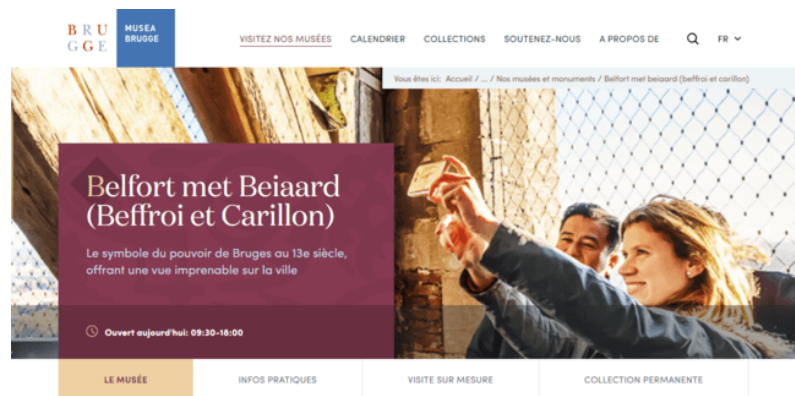
get a closer look at its architecture. There is also a second tactile model that gives a more global view of the town right next to the Belfry model. Information panels in Braille are also available for people with sensory disabilities.

Comments left online by many visitors complain about the long line to get tickets. The climb is quite difficult, although the exhibition hall offers a break. The entrance fee is mostly perceived as expensive, although the price is worth it for many visitors, especially for the 360° view. The visit is rated 4.6/5 on Google with 8,958 comments and 4.5/5 on TripAdvisor with 7,832 comments.

Information and Communication Technologies

The abundance of comments on various sites suggests the popularity of the place. However, a closer look at the Belfry's use of ICT shows that it is not fully adopted. The Belfry is visible on a website that is not its own: Bruges Tourist Office, which includes a number of buildings and museums.⁶⁶ The section dedicated to the Belfry allows to learn more about the museum and the permanent collection, to find out practical information or to prepare your visit with a booking system. Although the Belfry has its own section, with information to help prepare the visit, there is a difference in the data between the sites presenting the Belfry, which do not display the same prices. This can be misleading for visitors preparing their visit and thus dissuade them from coming.

Finally, the Belfry is not present on social media. The Belfry's reputation, correlated with its use of ICT, suggests that it has no need to develop them to improve its attendance.



Conclusion

Bruges, the commercial and cultural capital of Europe, is one of the most touristic cities in Belgium. Thanks to its favourable location and its direct connection

⁶⁶ Screenshot of the section dedicated to the Belfry on the website of the Bruges Tourist Office <https://www.museabrugge.be/fr/visitez-nos-musees/nos-musees-et-monuments/belfort>

to the North Sea, its national and international accessibility is a real asset for the town's tourism. In addition, Bruges has many heritage sites and buildings in its historic centre, which is a UNESCO World Heritage Site, and also offers various events and activities, attracting more and more tourists every year. Faced with mass tourism, the town has had to develop several actions. However, as tourism actively participates in the town's economy and development, the local authority cannot take drastic measures.

The town of Bruges seems to be in a transitional phase with regard to the use of ICT. The majority of its heritage and cultural structures are now starting to integrate them into their mediation tools, often adding value, as is the case with the Historium. Moreover, the use of ICTs is not necessarily needed, depending on the type of institution. Sites such as the Belfry are perfect examples of the fact that not using ICT is not a barrier for tourists, as the Belfry is, on the contrary, one of the most visited sites in Bruges. Moreover, ICTs are becoming major communication elements, giving visibility to the structures and informing people of the latest news. Finally, they allow for interaction with users, thus ensuring post-visit follow-up.

SANTANDER

Santander, a coastal town in northern Spain, is the capital of the autonomous community of Cantabria. Its geographical location has allowed it to develop a tourism and maritime economy through its port, which hosts both commercial and yachting activities. The town itself is divided into several districts, the most visited of which are the town centre and *El Sardinero*, where the Palacio de la Magdalena, one of the town's emblematic buildings, is located.

Like many coastal towns, Santander saw the first tourist activities develop at the beginning of the 19th century. At that time, tourists, notably those from Madrid, were all part of the wealthy classes: aristocrats or rich bourgeois. They also had specific reasons to go to Santander: their health. Even nowadays, tourism in Santander is often linked to thermal baths, water and sea air, which are considered beneficial for the human body. It was in the summer of 1847 that the first *Baños de Ola* de Santander were organised, i.e, the first sea baths from the beaches surrounding the town. The climax of the activities was when Queen Isabel II went to the town in 1862. To welcome her, the town developed new spaces: it transformed the *El Sardinero* district, whose small fishermen's houses were replaced by thermal facilities, built a Casino in 1870 and large hotels such as Castilla, Hoyuela, París, La Esperanza.

In the 20th century, the beginnings of summer tourism led to the transformation of the Magdalena peninsula, with the building of a palace bearing the same at its end. Santander remained a favourite holiday destination for the Spanish king Alfonso XIII and the rest of the Spanish aristocracy of the time. But the success did not last, as the town gradually lost its popularity to cities such as San Sebastian and Biarritz, that more celebrities visited. These two cities suffered less from the Spanish Civil War later on.

The 1950s and 1960s saw an increase in the number of foreign tourists thanks to the reopening of Franco's Spain to tourists, especially French ones, and the creation of festivals, highlighting arts such as dance, music and theatre, with the aim of developing the town's cultural offer.

Mass tourism finally began in the 1970s. This led to an increase in the number of tourists, mainly Spanish. With the arrival of middle-class travellers, the "*So/ y Playa*" tourism began, which continues to this day thanks to the many beaches nearby. However, when we compare the visitor numbers on the Cantabrian coast with those on the Costa Blanca, it is clear that Santander does not enjoy the success of the Mediterranean resorts, which have a milder climate.

Today, as in the past, the port of Santander plays an essential role in the development and influence of the town. It was already important in ancient times, but it was in the Middle Ages that it became really important, as it was home to the shipyard that built the fleet of ships of the Kingdom of Castile. The port remained important throughout history, as it later played an important role in the connection with the Spanish colonies, allowing the consolidation of links with the cities of San Cristóbal de La Habana, Montevideo, Buenos Aires, Cartagena and Veracruz. These privileged relationships enabled the town to develop through its port and to become a real maritime power.

Nowadays, the town's link with its port is reflected in its cuisine, as Santander's typical gastronomy is made up mainly of seafood. This has led to the development of gastro-enological tourism, as the town has a wide variety of restaurants and bars that serve top quality products thanks to their proximity to the sea.

I.

Tourism diagnosis

Network accessibility

How to get there?

To get to Santander, there are four main means of transport. The first, the car, is the most used one. As a large proportion of tourists to Santander and Cantabria are Spanish, it is the most flexible and economical. The second, plane, is the means of transport that has developed most in recent years. *SeveBallesteros-Santander* airport, which was moved to its present location in 1953, only really developed in 2003, when Cantabria joined forces with Ryanair to offer more affordable flights. The airport soared [Appendix 1] and it is now the second largest one in northern Spain regarding passengers per year. The combination has also led to an increase in international tourism in recent years, helped by the fact that the airport is only five minutes from the town centre by transport. The third, train, is a traditional mode of transport. It arrived in the 1850s and 1860s⁶⁷ and was initially used to transport goods, before becoming transport for passengers. Today, the railway network connects Santander to its region and to Spain (some capitals of autonomous communities). The last one, the ferry, is managed by the company Brittany Ferries, which offers weekly connections between Santander and Plymouth or Portsmouth, allowing for a continuous flow of passengers [Appendix 2].

Getting around Santander

Once there, transports can be done by car, bus or bike. Car is the main mode of transport for inhabitants, but also for most Spanish tourists. To deal with cars, the town has numerous car parks, both with fee (in the town) and free (in the outskirts). The peripheral car parks are linked to the town by a bus network (27 bus lines⁶⁸).

As far as tourist transport is concerned, there are tourist buses (City Sightseeing Santander⁶⁹), which pass through the ten main tourist spots in town. Bikes are also available for hire, managed by the companies TUSBIC and TURYBIC, so visitors can enjoy long rides along the seafront and move around the different areas of the town more easily [Appendix 3] than by car or on foot. Finally, cruises or boat trips are offered to discover the bay or the sea bed near the town, reaffirming the ever-present link between Santander and water.

⁶⁷ Article from theDiarioMontanes:<https://www.eldiariomontanes.es/20081116/sociedad/domingo/anos-ferrocarril-cantabria-exposicion-20081116.html?ref=https:%2F%2Fwww.eldiariomontanes.es%2F20081116%2Fsociedad%2Fdomingo%2Fanos-ferrocarril-cantabria-exposicion-20081116.html#comments>

⁶⁸ Interactive map of bus routes: https://moovitapp.com/index/fr/transport_en_commun-lines-Santander-4364-934472

⁶⁹ Tourist bus website: <https://city-sightseeing.com/fr/27/santander/239/bus-touristique-santander>

Accommodation

The results concerning accommodation do not fully reflect the tourist situation in Santander, simply because a part of the Spanish tourists occupy non-market beds (second homes, family, friends) when they come to the town.

As regards paying accommodation ⁷⁰, 41.1% ⁷¹of tourists stay in hotels (2018). Although hotels are still the most popular type of accommodation for national and international tourists, there has been a sharp increase in the supply of tourist flats, which is widespread in Cantabria, between 2001 and 2018 (from 423 to 1,475 beds available⁷²). It reflects a general trend linked to tourists' desire for independence and autonomy. Santander is obviously the place with the highest concentration of tourist accommodation, but also of Airbnb. There are 239 accommodations listed on this website. The interesting point here is that only 79 hosts speak English, 39 French and 11 German (the three most common nationalities of foreign tourists). The data illustrates, first that Santander remains a town mainly influenced by national tourism and then, it shows the difficulties of adapting certain tools and aspects of tourism to the town's desire to attract more foreign tourism.

Study of audiences

The town's tourist offer

Historically, Santander's tourism offer has revolved around its beaches. However, since Santander has applied (2008⁷³) to become "European Capital of Culture" in 2016, the town has begun to steer in another direction. This change is illustrated by the diversification of the town's tourism offer, which is no longer exclusively based on "sol y playa" tourism. Although the town was not elected, San Sebastian was chosen, the momentum that was started has continued.

The new axes developed are mainly: cultural tourism, gastronomic tourism, and MICE tourism (business tourism). The diversification aims at attracting new audiences and, then at making the town's tourism less seasonal. The town (also in Cantabria) is strongly committed to communicating its tourist offers and has modified its logo⁷⁴ accordingly in 2018. The logo, which illustrates the colours of nature and the sea, is used to represent the town's emblematic places.

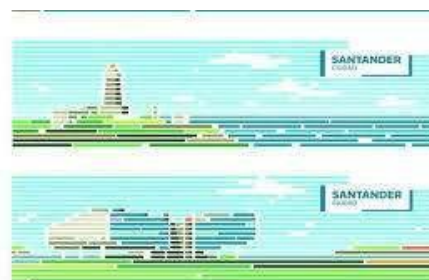
⁷⁰ Inventory of tourist beds carried out by the city of Santander in 2020: <https://www.marseca.es/turismosantander/descargas/Guia%20Alojamientos%20de%20Santander.pdf>

⁷¹ Tourism marketing plan for the Cantabria 2020-2021 promotion campaign. Downloadable from: <https://profesional.turismodecantabria.com/info-y-documentacion/estadisticas-e-informes>

⁷² Final thesis by HOYAS BALBAS, Alba, on the impact of tourism on the economy of Cantabria (1957-2018): <https://repositorio.unican.es/xmlui/bitstream/handle/10902/17449/HOYASBALBAS%20CALBA.pdf?sequence=1&isAllowed=y>

⁷³ ArticleEl *Diario Montañés* (03/09/2008) <https://www.eldiariomontanes.es/20080903/cantabria/santander-candidata-capital-europea-20080903.html>

⁷⁴ Images of the logo of the city of Santander.



In the case of cultural tourism [Appendix 4], the town supports this policy *through* the creation of several events (La Cultura Contraataca) and cultural structures (Archaeological Centre of the Medieval Wall in 2009, Fire Route in 2016, Botin Centre in 2017). The latter is highlighted by the town in its communication as a symbol of the quality of the town's cultural offer. This position is made possible by the work carried out by the structure in the content offered. This work was praised in the report by the "*Observatorio de la Cultura. Lo mejor de la cultura 2019*", in which the Botin Centre was ranked sixth in the national ranking of cultural institutions ⁷⁵. Although cultural tourism is developing in Santander, thanks to the support of the town authorities, which want to make it a major cultural centre in the north of Spain, it is still not the main reason why tourists choose Santander as a tourist destination.

As far as gastronomic tourism is concerned, several points are put forward by the town to attract tourists. First of all, its geographical position (coastal, with mountains nearby) influences the products used and the local specialities. There is a focus on regional and protected products, such as "Carne de Cantabria", a PGI beef. This offer, based on quality products, is confirmed by the fact that Cantabria has six Michelin-starred restaurants ⁷⁶. Although this is only a small proportion of the restaurants in the area, it is an excellent showcase for the region.

The last part of the tourist offer developed by the town is business tourism (or MICE). In 2018, the town of Santander hosted 347 events, for a total of 64,023 people⁷⁷. These figures, which are constantly increasing, are reinforced by the renovations carried out at the Palacio de la Magdalena (the venue in which a large part of these events are held). One of the advantages of this form of tourism is that the people who attend these events generally spend more than 'normal' tourists. In Santander, a foreign tourist spends an average of 105.1 euros per day (2016 data) and a Spanish tourist 52.4 euros per day (2016 data), while MICE tourists spend 241 euros per day (2018 data). The other advantage of this type of tourism is that these

⁷⁵ Voting by professionals of the sector, based on the content offered by the structures (exhibition, workshops, other cultural events...)

⁷⁶ IFOMO article, 15/12/2020: <https://www.ifomo.es/articulo/cantabria/cantabria-cenador-amos-mantiene-estrellas-michelin-bicicleta-consigue-estrella-verde/20201215090046169065.html>

⁷⁷ Conference of 23/09/2020, given by NuriaSalesa AMARENTE. Broadcast on Facebook Live: https://www.facebook.com/watch/live/?v=696456337621575&ref=watch_permalink

people usually come from far away, which allows Santander to be known in geographical areas where the town does not necessarily communicate.

The town's audiences

The majority of tourists in Santander comes from Spain, at 72.6%⁷⁸. Most of them are from the adjacent Spanish provinces (Basque Country, Castilla y León) and from the province of Madrid. Nevertheless, in recent years, especially since the arrival of Ryanair, the share of foreign tourists has increased (27.4% in 2017). These tourists come mainly from France (as a neighbouring country), the UK (thanks to the ferry connection) and Germany. However, the Covid-19 crisis has slowed down this process, and given how recent the transition is, the question of whether this will continue remains uncertain.

The main types of publics observed are families and couples without children. The town's marketing policy is therefore successful in targeting this audience. The main age group is 25-44 years old ⁷⁹, which is younger than that of Cantabrian tourists. Since the 1970s⁸⁰, the trend has been towards a younger age group. This illustrates the partial success of the town's and the region's tourism project, which is based on a dynamic and lively promotional campaign, promoting the different experiences that can be had in the area.

In terms of visitor figures, the first thing that stands out is the difficulty in finding precise data on tourist numbers in Santander. The majority of the figures relate to the Cantabrian region. It is true that Santander is one of the main tourist driving force of the region, but this lack of data hinders the analysis. However, there is a strong seasonality in tourism, concentrated on the period from June to mid-September. This is justified first by the type of tourism historically developed by the municipality, namely "*sol y playa*" tourism, *which is* still very present. The climate of the North Atlantic coast of Spain remains an important marketing element for the town and the region. Then, the seasonality, which already exists, has been accentuated by the arrival of international tourists ⁸¹, who have accentuated the phenomenon. These fluctuations can be seen in the occupancy rate of the town's hotel accommodation [Appendix 5] between the high and low periods. This is also due to the fact that winter visitors stay largely in non-enlisted accommodation.

⁷⁸ Santander Marketing Plan (2018-2020): <https://turismo.santander.es/wp-content/uploads/2018/11/plan-de-marketing-turistico-santander-2018-optimizado.pdf>

⁷⁹ Data for the period 2009-2014. Source: <https://turismo.santander.es/wp-content/uploads/2018/04/plan%20estrategico%20santander.pdf>

⁸⁰ Final thesis by HOYAS BALBAS, Alba, on the impact of tourism on the economy of Cantabria (1957-2018) <https://repositorio.unican.es/xmlui/bitstream/handle/10902/17449/HOYASBALBAS%20ALBA.pdf?sequence=1&isAllowed=y>

⁸¹ Article from the town hall on the evolution of summer tourism between 2018 and 2019: <https://santander.es/content/turismo-internacional-aumenta-santander-julio-agosto-respecto-2018>

ICT Diagnosis

Visitor support materials

According to the information available to us, few of the town's cultural institutions offer tools to assist digital visits. Santander has been a Smart Town since 2014⁸² and *DestinoturísticoInteligente* since 2018⁸³. In the end, the tools are not very present in cultural places, with the exception of a few that benefit from the know-how of Santander Town Council. Of those that use digital tools, seven offer virtual tours⁸⁴. Virtual tours and mobile apps are the most represented in Santander's cultural venues [Appendix 6], but they tend to be visual without adding value. Ideally, they should not replace a real visit, but should instead provide something new.

The diversity of tools to help visit the site seems to be a factor in the number of visitors and their appreciation. Indeed, institutions offering a greater variety of tools are generally rated higher by visitors on TripAdvisor. After an overall study of visitors' comments on all the sites we have inventoried, it is the guided tours that seem to be the most appreciated by tourists among all the support materials available, whether they are digital or physical. Moreover it has often been shown that visitors prefer the human to the digital. Digital tools and human mediation must therefore work together to be effective and reach the widest audience possible⁸⁵. Finally, we can observe an increase in museums admission fees as soon as they have digital devices, but also according to the amenities they offer (restaurant, toilets, Wi-Fi, etc.).

Communication

Cantabria is among the least developed autonomous communities in terms of Internet use: 74.9% of Cantabrians use the Internet daily, while the national average is 77.6%⁸⁶. Nevertheless, Santander, a pioneer in Smart Cities, is even considered an example for other cities.

⁸²Delphine CunySantander: the city of 20,000 sensors, model of the European smart city", *La Tribune*7 November 2014. URL : <https://www.latribune.fr/technos-medias/internet/20141107tribe37bf8af2/santander-la-ville-aux-20-000-capteurs-modele-du-smart-city-europeen.html>. Accessed on 13 January 2021.

⁸³"Santander (Cantabria)", *Red de Destinos Turísticos Inteligentes*[n.d.]. URL : <https://www.destinosinteligentes.es/destinos/santander/>. Accessed on 13 January 2021.

⁸⁴Biblioteca y Casa Museo de Menéndez Pelayo, Centro de interpretación de los antiguos muelles, Centro de interpretación "Historia de la ciudad de Santander", Ruta del Incendio, MUPAC, Palacio de Festivales and Palacio de la Magdalena.

⁸⁵Jean-Thibaut Roofer, *THE ONLINE MUSEUM EXPERIENCES*.l.] : Groupe SOS Culture, June 2019.

⁸⁶"Cantabria, por debajo de la media en el uso de TIC", *La Vanguardia*, sect. Cantabria, 16 October 2019. URL : <https://www.lavanguardia.com/local/cantabria/20191016/471024907950/cantabria-por-debajo-de-la-media-en-el-uso-de-tic.html>. Accessed on 17 November 2020.

The increasing use of the internet in the preparation of trips or holidays gives organisations that use these tools a significant advantage. In order to improve the number of visitors to the sites, we can therefore recommend greater use of social media. It is a simple and generally inexpensive improvement. For example, the Centro Botín, which has known how to use social media since its opening. Similarly, the lack of social media in the Town Council is somewhat surprising for a town as connected as Santander. However, social media could enable the town to attract a wider population, especially a remote or foreign audience. Moreover, it is enough to choose a particular network to target a certain category of the population. These tools are becoming a must, and are becoming more of a criterion for visiting or not visiting, especially thanks to the ratings, opinions and comments of other visitors. There is also a big difference in account activity between the summer season and the off-season. This difference may seem strange for the town, as it is trying to reduce seasonality. Finally, all the posts are entirely in Spanish which can be explained by the fact most tourists are Spanish.

Although Santander is a Smart Town, the ICT used in these tourist institutions is often limited to social media and websites. In addition, some facilities do not have their own social media pages: these often belong to a higher institution, such as the "Museos de Cantabria" site, which groups together all the museums belonging to the Cantabrian government. This generally benefits the institutions by reducing the costs of managing these pages, but they can be less effective. Indeed, finding a particular piece of information can be more difficult when it is lost in a flood of more general information. Similarly, social media sites may be less targeted, reaching an audience that is only interested in one part of the institutions. On the other hand, this type of media or shared website can be effective in showing the global panorama of a destination by bringing together some of the information from tourist sites in one place.

Study of the Prehistory and Archaeology Museum of Cantabria and the Fire Route

In order to illustrate our previous analyses, we have chosen to develop in greater detail two tourist sites in the town of Santander that make use of new information and communication technologies: the Museum of Prehistory and Archaeology of Cantabria and the Fire Route. These two sites have a very different cultural offer and use of NICTs, which is why they have been chosen.

Museum of Prehistory and Archaeology of Cantabria ⁸⁷

1) Presentation of the site

The Museum of Prehistory and Archaeology of Cantabria⁸⁸ is a museum specialising in archaeology. When it was created in 1926 by the Provincial Council of Santander, the management of the institution was entrusted to Jesus Carballo



Garcia, a well-known local archaeologist from Santander. Initially housed in the Santander Institute, now the Santa Clara Institute, the collections were moved in 2008 to the Research Centre, now known as the Mercado Del Este, which was inaugurated in 2010. Since then, the museum has continued to flourish. In 2013, the permanent collection was inaugurated.

Three years later, in 2016, an expansion project was confirmed with the construction of a new building in the car park of the Palacio de Cantabria theatre. With the development of new technologies in recent years, the museum has been able to adapt to the evolution of communication and meet the new demands of the public.

⁸⁷ Website of the museum, on the Cantabrian museums website: [Situación - museoscantabria - cantabria.es \(museosdecantabria.es\)](http://situacion-museoscantabria-cantabria.es/museosdecantabria.es)

⁸⁸Photo of the Museum of Prehistory and Archaeology of Cantabria, [Museo de Prehistoria y Arqueología de Cantabria, MUPAC Cantabria \(cantabrianrural.com\)](http://museo-de-prehistoria-y-arqueologia-de-cantabria.mupac-cantabria.cantabrianrural.com)

Audiences and mediation

Today, the museum offers several different visiting experiences⁸⁹ to suit different types of public. From Tuesday to Sunday, it is possible to discover the collections either on a self-guided tour, lasting an average of forty-five minutes, or on a guided tour. The tours are organised regularly throughout the day at set times, except on Sundays. It is specified that the group must be composed of a minimum of ten people for the tour to take place. It is also possible to use the virtual tour offered by the museum⁹⁰ on its website to tour the collections. In a situation such as the Covid 19 global pandemic, this kind of arrangement is essential to keep museum institutions alive for the public.

Wishing to meet the expectations of as many people as possible, the museum has also invested in new technologies. Equipped with numerous audiovisual and interactive media, digital posters and large-format scenography, the museum wraps visitors in a museographic garment of tactile, sound and light sensations. Moreover, an analysis of the reviews left on Google (1008 reviews) and on the Tripadvisor website (387 reviews) shows that the museum's scenography and itinerary are appreciated, and in particular, the use of new technologies. It is also emphasised that the visit is adapted to all ages, as the museum has taken into consideration adults as well as children of all ages in a playful way to create its route.



In terms of access the museum is ideally located in the heart of the town of Santander and the town's tourist circuit. The museum has been designed on one floor without any access difficulties to provide for visitors with reduced mobility.

In general, the museum has favoured the use of digital tools in order to best meet the needs of the museum public, whether in terms of teaching or the space layout. However, the museum has not developed its accessibility on the Internet.

Information and Communication Technologies

⁸⁹ Photo of the museum's mediation tools, [El edificio - museoscantabria - cantabria.es \(museosdecantabria.es\)](http://El edificio - museoscantabria - cantabria.es (museosdecantabria.es))

⁹⁰ It is available on the museum's website above.

As already mentioned, the Museum of Prehistory and Archaeology of Cantabria has a web page giving access to key information. However, the web page is not specific to the museum but to all the museums in Cantabria. The works in the museum's specialised library can also be consulted from the website. However, these are only available from the museum catalogue, which can be found on the Cantabrian public reading website. The same applies to social media.

The Facebook and Twitter pages, on which the museum is present, are not its own. This sharing of communication tools with other Cantabrian museums does not prevent the museum from offering quality content on the platforms. The use of ICTs made directly by the Cantabrian Museum of Prehistory and Archaeology is therefore focused on technological mediation tools, with the town's tourist sites managing communication through the Internet.

It does not seem to be a hindrance for visitors, but the museum could find an advantage in developing this aspect of its visibility because social media represent a real challenge today. First, it allows the museum to increase its visibility significantly, but also to get closer to its public, to create interaction via its publications.

Fire road

Presentation of the site⁹¹

Unlike the Prehistory and Archaeology Museum of Cantabria, the Route of The Fire is not a cultural institution.



Designed as a tourist route, this tour also has a commemorative purpose. On the occasion of the seventy-fifth anniversary of the fire, the municipality of Santander wanted to highlight the fire that devastated the historic centre of the town on February 15th 1941. On that day, 1,783 houses were destroyed, 115 people were injured and one firefighter was killed. It took 25 years to rebuild everything.

The municipality also wanted to broaden the town's cultural offer, so this exhibition, deployed throughout the historic centre, was conceived as a new cultural route that would remain after the commemorative period. Through ten different stages, visitors are invited to discover the important changes that have taken place in the town as a result of the disaster. The route begins in the historic centre, in the pedestrian street

⁹¹ Photo of one of the totems on the route, [RutadelIncendio.de.Santander\(incendiosantander.com\)](http://RutadelIncendio.de.Santander(incendiosantander.com))

"*Calle Cadiz*", opposite the Cathedral of the Assumption of the Virgin Mary. The last point is in Calle de Herrera⁹². In order to guide the public along the route, various tools have been designed to make it as easy to use as possible.

Audiences and mediation

In order to establish this route as one of Santander's tourist circuits, it was necessary to offer a real visiting experience, adapting to the expectations of different audiences. The route can be followed on a self-guided tour, following the ten totems deployed around the historic centre. They offer an understanding of the changes in the town with the help of explanatory panels, photos and the surrounding landscape. It is also possible to follow a guided tour. From the comments left on Tripadvisor, it seems that this option is the most popular. The only comment referring to the panels themselves was that they were not well maintained.

A final means of visiting is also available on smartphones only. The app is dedicated to the circuit, called "*Incendio Santander*"⁹³. It is available in Spanish, French and English on iOS and Android⁹⁴, and can be downloaded from the phone app stores as well as from the Santander Fire website. It offers an audio-guided tour, using the numbers on the different totems. Proximity sensors placed in the totems makes access to the information easy. The application provides subtitled audio tapes for the hearing impaired and pictorial resources (an image illustrating each audio). A version of the app is also available for the visually impaired. It is one of the only interfaces on which we were able to find the map of the walk and a description of the route. At the time of the commemoration, more specific guided tours had been added, offering different points of view: from witnesses, historians or photographers... A version is also available for the visually impaired, offering an audio description.



Despite this varied offer, several problems should be highlighted. It appears that all these offers are mainly aimed at a Spanish-speaking public. The visits are only offered in Spanish. However, the use of a technological tool such as the app makes it possible to increase the accessibility of the audio comments, firstly for

⁹² The course does not make a loop.

⁹³ Photo of the application, taken from the website of La Ruta de Santander, [APP INCENDIO DE SANTANDER 1941 - Página oficial - \(incendiosantander.com\)](http://www.incendiosantander.com)

⁹⁴ Link to Google Play: [Incendio de Santander - Applications on Google Play](https://play.google.com/store/apps/details?id=com.incendio.santander)

foreigners, offering visits in three languages; but also for the visually and hearing impaired, thanks to the subtitled videos and the audio description option.

Information and Communication Technologies

You can find The Fire Road on social media through its website, Twitter, Facebook, Instagram and Youtube. The website, which is dedicated to the commemorative anniversary and the fire exhibition⁹⁵, is very comprehensive and provides access to various information. This information explains the reasons for the route, but also presents the information found on the panels or on the application. In addition, it is possible to access the virtual tour of this exhibition called "Cenizas" ("Ashes" in Spanish)., the public can discover the fire through stereoscopic photography⁹⁶ and cinema on computer or smartphone. Newspaper articles, testimonies, photo galleries and a map of Santander before the fire are also available. But the site has two problems. Firstly, it is only accessible when you search in Spanish or English, but not in French. Secondly, it does not really give any information about the Route itself, apart from the link to download the app. It mainly lists information about the historical event rather than practical information about the tourist route.

Concerning social media, several pages are dedicated to the route. Created in 2016, the Twitter, Facebook and Instagram pages have several subscribers ranging from 203 for Twitter to 1,362 for Facebook. The latter page was the most active: the last publication was in November 2019. However, they have not been active for a long time, suggesting that they are no longer used. As for Youtube, only 12 testimonial videos are available, posted more than three years ago.

In fact, to get up-to-date information on the route, you should visit the Facebook or internet page "Tour Santander". These pages promote the three historical tours offered by the town: the "Santander, bajosecreto de sumario", the "Rutadelincendio" and a third one currently in preparation. You can only find information about the guided tours offered by the tourist office on this website. However, as with the rest of the information, it is only available in Spanish, as the sites do not offer any translation. The site is not highlighted in internet searches either, making it difficult to access the information. In this case too, it seems that the communication around the "RutadelIncendio", using ICTs, was mainly designed for a local, national audience.

In a nutshell, the Fire Route is a new tourist route offered by the town of Santander which has been able to take into account the new expectations of the local public, which seems to be generally satisfied with the offer. It has great potential, as it offers a route that combines the old Santander with the new one and

⁹⁵ This temporary exhibition was presented to the public from February to May 2016 in the Angel de la Hoz room of the Santander Documentation and Image Centre

⁹⁶A system for distinguishing relief from flat images using a camera with two lenses.

offers different ways of visiting it. However, it is mainly promoted to Spanish speakers and excludes foreign tourists from this cultural offer.

Conclusion

The town of Santander has undergone many transformations over the centuries and tourism has had a hand in shaping the new urbanisation. The sites of cultural interest are, for the most part, clustered in the town centre, facing the ocean. It seems to us that one of the main goals of the town is to strengthen its position as a prestigious seaside resort.

Santander, also a "Smart Town", is an intelligent tourist destination (*destinoturísticointeligente*), serving as an example for other cities wishing to develop their connectivity. The study shows that the presence of both cities and cultural or tourist institutions on the Internet has a significant impact on their attendance. Many of the town's cultural institutions offer virtual tours and digital tools to help visitors. For example, the Museum of Prehistory and Archaeology of Cantabria also includes in its mediation policy tools linked to new technologies, which seem to please visitors. In addition, the *Rutadel-Incendio* urban tourist route shows the town's desire to develop its cultural offer.

The careful observation of these different structures, in addition to that of the town, has thus made it possible to identify some shortcomings in the town's cultural development policy and to make some suggestions to improve it. It seems important, as a first step, to offer tools in several languages, whether in the sites open to the public or on their Internet pages. Similarly, virtual tours, although popular, do not currently provide any real added value to museum visits. Their content could therefore be enriched.

Visitors are showing a certain enthusiasm for the new tools to help them visit the museum and the widespread use of digital technology. Although essential to enable museums to place themselves in a modern dynamic, it seems to us that digital technology should not replace the presence of human mediators. On the contrary, it would be much more interesting to combine the two, because it is the possibility of interaction and adaptation to the human being in front of you that makes the experience richer.

The Douro Valley

The Douro River, which gives its name to the valley, originates in Spain and flows into the Atlantic Ocean at the town of Oporto, in the North West of Portugal. The study is devoted to an area extending from Mirando do Douro to Oporto. It is thus possible to observe a variety of landscapes that give the place its singularity and its fame in the wine industry.

A relief that is favourable for growing vines that has been created by an alternation of shale plateaus [*Appendix 1*] and mountains, reaching 1,400 meters in the west and 1,000 meters in the north. Taking advantage of the climate of the northwest of the Iberian Peninsula, the area is also home to other forms of crop such as olives, almonds and various types of fruit and cereals [*Appendix 2*]. The valley is thus divided into several areas, the most famous of which is the *Alto Douro Vinhateiro (ADV)*, the Upper Douro wine region since 1756.

Growing vines is very old. Traces go back to the Middle Neolithic period and continued during Antiquity and the Middle Ages. Wine tourism on the other hand, is a rather recent practice. This form of tourism developed thanks to two phenomena: the end of the monopoly on the ageing of Port Wine in Vila Nova de Gaia ⁹⁷ and the authorisation to market and export wine directly from the production sites (May 1986).

Following the Carnation Revolution in April 1974, the end of the Salazar dictatorship allowed Portugal to gradually open up to the rest of the world. The Portuguese authorities undertook a modernisation of the country where tourism represented, at the time, an additional option for territorial development. This is how wine tourism was to develop little by little from the 1990s onwards. Major research work was undertaken in order to enable part of the valley to be classified as a UNESCO World Heritage Site.

The river also provides a communication route to Europe, facilitating the transport of goods and merchandise by means of the *barcos rabelos*. The main goods traded by this means were fruit and wine before the gradual arrival of the train at the end of the 1870s. The river is nicknamed the "Golden River", attesting to its economic importance.

The waters of the Douro can sometimes be difficult to control. Indeed, the river is supplied by several inflows, the three most important of which are: the Sabor, the Pinhao and the Corgo [*Appendix 3*]. The dams [*Appendix 4*] allow a better control

⁹⁷ Peso da Régua warehouse, created in December 1978, for the storage and marketing of the generous wines of the Douro Valley.

of the water flow and do not hinder the passage of cruises or the organisation of water sports activities that enrich the tourist offer of the Douro Valley.

Tourism diagnosis

Network accessibility

How to get there?

To get to the Douro Valley, several types of transport are available to tourists. The presence of the Francisco Sá-Carneiro airport in Porto is a first asset for international tourism. This airport serves 95 destinations and can welcome up to 16 million passengers a year.⁹⁸ Tourists can also choose to travel to the region by cruise ship. The port of Leixoes in Porto received 101 ships in 2018, with a total of 117,000 passengers, 22% more than in 2017. Nationally, you can access the valley by railway, thanks to the public company Comboios. There are many regional lines, which allow accessibility from Porto, to different important stations such as Peso da Régua, Tua or Cachão. The region also has many national roads and motorways, making it easy for tourists to reach.

Getting around the area

Traffic in the region is possible thanks to different means of transport. Different transport companies, bus, taxi or cruise companies have developed. Tourists can also choose to travel by car. The company Inbictus offers to pick up customers at their place of residence and drive them for a day, in order to carry out a tourist tour in the region. Several tours are offered, such as the Douro Wine Tour or the Douro Valley Tour. Tourists can choose to take a cruise on the Douro River. The company Cruzeiros do Douro offers cruises, ranging from one day to several days. These cruises leave from Porto, Peso da Régua and Pinhão. Tourists travel by sea and are offered thematic tours to discover the region. Finally, the region can be visited by the "ComboioHistórico do Douro" train. This is a one-day trip that allows tourists to travel on a train from the beginning of the 20th century.

Study of audiences

The tourist offer of the Douro Valley

If the Douro Valley is a territory that revolves mainly around its landscape and its intangible cultural heritage, it is vine growing and wine that make the tourist image of the valley. This is confirmed by the many cruise ships that pass through the river. The same boats will allow vines to be promoted, bringing the numerous *quintas* in the area to life. These quintas continue to sell the "green" image of the Douro thanks to their guided tours of the winery, most often ending with a tasting of their products.

⁹⁸ Porto Airport website: <https://www.porto.fr/aeroporto-porto>

There is a real search for authenticity. The intangible heritage is highlighted by most of the offers made to tourists during their trip. Handicrafts, cuisine and wine, but also the culture of myths and tales, are most often highlighted, as we have already mentioned with the visits to the *quintas*.

Part of the valley has been classified as a UNESCO World Heritage Site since 2001⁹⁹. In the collective imagination, the aim of obtaining this classification was to attract foreign tourists who are often fond of this type of label, following the example of the Americans or the



English. At the same time, there was a significant increase in the number of hotels and restaurants in the UNESCO region between 1995 and 2005. This increase is concentrated around 2003 and 2004, i.e. the years following the UNESCO classification (23.18%)¹⁰⁰. An increase in the turnover of hotels followed with 18,190 thousand figures in 1999 and 94,676¹⁰¹ thousand euros in 2009 [Appendix 5]. However, a large part of the tourism-related infrastructure is located in the classified part of the Douro Valley. It represents 95%¹⁰² of the tourist offer and also 86.8% of the region's turnover. There is a real imbalance between the classified and the unclassified.

Moreover, the classification as a UNESCO World Heritage Site has had a direct impact on the tourist and cultural offer of the Douro Valley. The reasons for the classification, the wine and vine growing, have become the emblems of the territory. The classification has thus fixed the image of the valley around these two notions.

Finally, although one of the first consequences sought with the classification is attracting foreign tourists in the valley, the communication, as well as the tools available to help the visit, are mostly in Portuguese. It is difficult to find materials translated into another language, even English. We are faced with an inconsistency that is still confirmed today, when we look at the different museum or heritage structures inventoried in the region.

⁹⁹Photo of the demarcation of the part of the Douro Valley classified as a UNESCO World Heritage site in 2001

¹⁰⁰Congress on the impact of tourism in the Upper Douro Vinhateiro region: https://bibliotecadigital.ipb.pt/bitstream/10198/10716/1/Sousa%2BMonte%2BFernandes_Atas%20III%20CIT_I_PCA_Out2013.pdf

¹⁰¹*Ibid.*

¹⁰²*Ibid.*

Audiences in the Douro Valley

On average, tourists do not stay longer than one and a half days in the valley. The lack of stopovers for cruise ships in the *quintas* or towns, as well as the lack of reception facilities (hotels) in the area, is the first problem with regard to the length of tourists' stay. Faced with a tourist offer centred on the wine culture, but also on the rural landscapes of the valley, tourists come more for a day to go hiking or visit a *quinta*, before leaving, either for another area of the territory, in the case of foreign tourists, or to go home, in the case of national tourists.

The latter remain the majority, despite an increase in foreign visitors since 1995. However, if between 2007 and 2013, 85%¹⁰³ of tourists were Portuguese, between 2015 and 2020, only 50% were nationals in the Douro Valley. The repartition between national and foreign tourists tends to be balanced. On the other hand, national tourists will go more inland, i.e. to the valley itself, while foreign tourists will prefer to stay close to Oporto or even go to another part of Northern Portugal [*Appendix 6*]. Therefore, the World Heritage listing has not had much effect on the arrival of foreign tourists in the area.

¹⁰³Congress on the impact of tourism in the Upper Douro Vinhateiro region: https://bibliotecadigital.ipb.pt/bitstream/10198/10716/1/Sousa%2BMonte%2BFernandes_Atas%20III%20CIT_I_PCA_Out2013.pdf

ICT Diagnosis

Visitor support materials

Thanks to the development of ICT, tourist and cultural sites are increasingly equipped with support materials. Visitors have access to a growing number of media, ranging from simple screens to mobile apps. However, the analysis reveals that the status of the structures has a direct impact on the choice of media and digital tools. For example, in museums, screens are more present, even if a predominance of audio-guide tools seems to stand out. In the *quintas*, outdoor guided tours and especially tastings predominate. These are generally limited to a website. These sites are rich in content and sometimes offer a blog. In the case of the natural sites or buildings that we have inventoried, there is little or no use of new technologies. Sometimes there are only explanatory panels.

Since April 2020, an app inventoried at the Douro Museum ("*Douro Museum*" on Android)¹⁰⁴ has been developed by the museum team. It has been downloaded more than 100 times. It is available in Portuguese, Spanish, German, English and French. Some of the videos are also available in sign language. This app allows to visit the most important rooms of the museum. There are two types of visits, one of which lasts 38 minutes. Indeed, when you first open the app, you can choose two durations : 25 minutes (audioguide), and 38 minutes (audiodescription). Both versions have the same content, but the audio description contains at the end of each audio commentary on the museum's exhibits, contextualising the story within the institution. The 25-minute audio guide can therefore be listened to outside the museum. When you open the app, you come across an image of the Museum with the words: Welcome - Bienvenue - Bienvenido - Bem-Vindo.

Communication

ICT in the Douro Valley territory

The Douro Valley does not have its own website or social media pages. Tourists have to go to the website of the local or even national tourist office to get the information they need to prepare their trip. The first problem is that the Douro Valley is not a town, but a territory, and it is therefore more difficult to harmonise its communication. The Douro Valley has thirteen municipalities within it, spread over 24,600 hectares.

¹⁰⁴Google Play page of the Douro Museum application:
<https://play.google.com/store/apps/details?id=com.realizasom.museudodouro&hl=fr&gl=US>

Nevertheless, a website allows tourists to get a first impression of the valley: *I Love Douro*¹⁰⁵. The latter includes practical information on activities to do such as *quintas*, visits or even boat trips. In the "Discover" section, tourists can find a map of places of interest throughout the valley, whether they are cultural or heritage sites or simply photo vintage points. This page, which will be extended to the affiliated social media such as Facebook and Instagram, aims to give tourists an experience. From an interview with a winegrower, to landscape photos showing the photo spots for social media influencers, this page details the tourist offer in the valley, focusing on vine and landscape.

Regarding apps on the Douro territory, two can be highlighted: the *TUR4all* app and the *Magnifico Douro*¹⁰⁶ app. With more than 1,000 downloads, the first one presents all the information for future tourists with disabilities on how to access the place so that they can better plan their trip [Appendix 7 and 8]. The user can find data on the practical accessibility of the place, illustrated with photos (entrance, reception area, lift buttons at wheelchair height etc.). The desire to include all tourists through this app, created in 2018, is in line with the national policy on disability accessibility, "*All for all*". This policy itself echoes Portugal's nomination as "Accessible Tourist Destination 2019" by the World Tourism Organisation. The second app, *Magnifico Douro*, is an audio guide dedicated to tourists cruising on the Douro. Created in 2019, the app has been downloaded more than 1,000 times on the Playstore. It allows to take a walk along the Douro and get information about the history and explanations of what makes the landscape. This app is available in five languages (Portuguese, French, English, German and Spanish). Two tracks are offered. The comments give a context to what visitors see and are launched by a Bluetooth terminal detection system.

ICT on inventoried sites

With the exception of religious buildings, the majority of the sites inventoried have a website. Notably, the sites that are most popular, or that are best rated on media such as Google or TripAdvisor, are the sites that offer a high "instagram" potential. The landscapes, which are widely promoted on the social media of the sites or blogs, have become a trademark of the valley and tourists are looking to take the most beautiful photo possible. The presence on the social media of the sites can therefore be a factor in increasing the number of visitors.

¹⁰⁵ Official website of *I Love Douro* :
<https://www.ilovedouro.pt/>

¹⁰⁶ Google Play page of the app:
https://play.google.com/store/apps/details?id=com.realizasom.magnifico_douro&hl=fr&gl=US

Study of Peso da Régua and the Douro National Park

Our tourism and ICT diagnosis led us to study different sites in the Douro Valley and two of them caught our attention in particular: the town of Peso da Régua and the Douro Natural Park.

There are several reasons why we chose these sites. First, from a geographical point of view, if one of them is located in the centre of the Douro Valley, at the crossing of a river and a stream (the Douro and Corgo) and acts as a gateway to the Upper Douro Valley, the second one is located at the extreme North-East of the Douro Valley, bordering with Spain. Secondly, we found it interesting to be able to compare an urban administrative territory, such as Peso da Régua, with a natural national administrative entity such as the Douro Natural Park. Finally, one of the two sites is a nerve centre where a multitude of activities, road networks and, above all, information are concentrated, while the other one presents very little information.

Peso da Régua

Presentation of the site¹⁰⁷



Firstly, it is necessary to give information on the context and the location of the town of Peso da Régua. Founded in 1836, the town was built on an existing administrative entity. Its geographical position, at the mouth of the Douro and Corgo rivers, allowed the town to control the flow of goods from the vineyards to the port of Porto. Moreover, the arrival of the train in 1879, which was relatively early, showed the importance of developing the railway network in this region and thus connecting Peso da Régua to the rest of the territory. Nowadays, the town is part of the Vila-Real district and is divided into eight parishes.

¹⁰⁷Map from the article "The Douro Region - Andrew Jefford takes a visit" Decanter Staff, "The Douro Region - Andrew Jefford takes a visit", 16 February 2007: <https://www.decanter.com/features/andrew-jefford-in-the-douro-247519/>

It is a large town (17,000 inhabitants) when compared to other towns in the valley. Peso da Régua stands out in this very rural valley because of its urban structure and facilities. There are many cultural and heritage facilities: a library, an auditorium, a theatre, chapels, museums, monuments, an archaeological station... Heritage and cultural events are also organised in Peso da Régua such as the Douro Medieval Days, the book fair, religious processions facilitated by the fact that the town is located on the pilgrimage route to Santiago de Compostela.

Audiences and mediation

Among the various sites in the town, the Douro Museum has the particularity of offering mediation facilities. This museum is housed in a building that is emblematic of the valley's history: the former *Casa da Companhia*, which belonged to the General Agricultural Society of the Upper Douro Vineyards, founded in 1756 when the first regulated wine-growing area in the world was created. The museum promotes the history of wine through various tools, including an app called *Douro museum*, which can be downloaded from Android free of charge ¹⁰⁸. It is available in several languages and offers two types of mediation: a 25-minute audio guide and a 38-minute audio description, both of which deal with different themes. The audioguide can be used outside the museum, as it deals with the general history of the valley. The audio description, on the other hand, contains an additional 13 minutes of commentary on the objects on display in the museum and must therefore be used *in situ*. Moreover, the app shows a desire to integrate the hearing impaired audiences by offering a reading in sign language. Each audio reading is followed by a MCQ, thus reinforcing the interactivity between the visitor and the app, to make it interactive for visitors instead of simply listening.

Apart from the museum, the town has also invested in 2019 in a mobile app called *VisitPeso da Régua*. This app has few downloads, just over 500, and seems to be only for Portuguese as it is only available for that language. It has six sections that tell the user what to visit, what to do, where to eat with the types of cuisine offered and where to sleep. In each case, the cards contain information on social media associated with the structure or place of interest, contacts, geographical coordinates to enable the user to access the places, photos and a description. The app provides information on important contacts to be made during the Covid-19 period, such as emergency services and hospitals. By centralising the data and the themes covered (museums, lookouts, *quintas*, etc.), the app could serve as a good territorial development tool to inform visitors and tourists. The fact that there is only one language offered seems to be due to the fact that the majority of tourists are Portuguese.

¹⁰⁸Google Play page of the application:
<https://play.google.com/store/apps/details?id=com.realizasom.museudodouro&fbclid=IwAR1G2LqUg96Y3JtKR3KsgyYEHk5BAv1ZFjTs0A5XpwTEqD-wD40pigEPHjY>

Information and Communication Technologies

In terms of the use of information and communication technologies, the town has taken advantage of several tools. It has had a Facebook page since 2011. More recently, the town has opened up to other platforms with, in 2018 and 2019, an appearance on Youtube and then on Instagram. The Youtube channel serves as a promotional showcase. Indeed, at its launch, the channel broadcasted a lot of videos about wine and local gastronomy. Then, in the summer of 2020, during the covid period, the channel turned to the promotion of cultural, heritage and natural places through short videos of 1 or 2 minutes. This allows the channel to attract a larger number of Portuguese internet users. The Instagram page also focuses on the visual promotion of the town and its surroundings, by publishing tourist photos modified with filters. They can come from the accounts of visitors who are then identified, which reinforces the proximity and interaction with Internet users. The videos of the YouTube channel are also published on Instagram, creating a harmonization between the different media used.

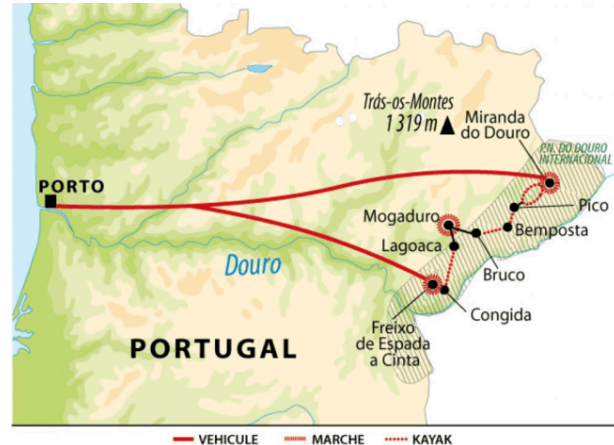
Overall, there is strong use and visibility on Facebook (19,000 *likes*) and Instagram (2,700 followers). The publications, which are very frequent, revolve around local actions and are mainly aimed at national internet users. Indeed, the publications are only communicated in Portuguese and are not translated for the most part. This is confirmed by the themes addressed and the number of people who subscribe to the pages. Some of the publications focus on wine-growing activities, know-how and local gastronomy, for which the Douro Valley and the town of Peso da Régua are renowned.

The town, although of average size, is trying to incorporate different tools around ICT but there is a lack of visibility on a large scale. The tool that seems to be most open to the international scene is the town's website, available in nine languages, most of which are European.

Douro National Park

Presentation of the site

The Douro International Natural Park (PNDI) or *Parque Natural do Douro Internacional* is one of the thirteen natural parks in Portugal. It was created by ministerial decree on May 11th 1998 and covers an area of approximately 87,000 hectares. The park straddles the border between Spain and Portugal, hence the name "Douro International". Its primary purpose is to protect the landscape, fauna and flora¹⁰⁹.



The biodiversity of the park is varied: there are several species of birds that are often threatened with extinction. The park is managed by the Institute for the Conservation of Nature and Forests (ICNF in Portuguese), a public body created in 2007. It is rather autonomous; notably regarding administrative and financial competences and the Portuguese State does not directly manage the institution¹¹⁰. Despite the name "Douro International", there does not seem to be any cross-border management of areas or joint actions with Spain.

Audiences and mediation

This site is managed by an administrative entity for the protection of the landscape, fauna and flora, and it is difficult to identify the types of mediation. Information on outdoor activities available includes hiking trails, canoeing, horseback riding and an "environmental cruise" offered by the International Biological Station located in Miranda. Picnic areas are available throughout the park. Some of the outdoor routes are signposted. In short, these are recreational activities. Popular festivals are also organised in the park, especially those directly related to biodiversity, such as the almond blossom festival. The lack of presence of the Douro Natural Park on the networks as well as the lack of available mediation seems to attest that the cultural and heritage mediation skills are the initiative of museum structures and local authorities.

¹⁰⁹Douro Valley, Northern Portugal Source: Douro Internacional. Map from the [ICNF](http://www2.icnf.pt/portal/ap) website <http://www2.icnf.pt/portal/ap>

¹¹⁰The exact management system cannot be found, and the *Protectedplanet* website, which lists the various protected areas in the world based on public data, cannot determine how the ICNF, which manages the nature park, operates: <https://www.protectedplanet.net/169019>

Information and Communication Technologies

It is very difficult to get information about the park. Indeed, there is no park page on social media. As for the website¹¹¹, it did not function during a good part of the analysis, making it difficult to access information. This also shows that the park is not being promoted digitally. The information is therefore rather patchy, scattered and terse. Most of the information on the park can be found on websites or travel blogs in the region. There is a TripAdvisor listing with only 52 reviews and a Google listing with just over 4,000 reviews and a rating of 4.7 out of 5 stars. The reviews praise the undeniable quality of the biophysical elements, but also of the hikes, as well as the quality of the welcome. In short, there is a difficulty in accessing information from institutional sources.

It is therefore necessary to dig a little to obtain information on the park's activities and the missions to promote and conserve the various heritages that have been set up. Finally, it is more difficult to manage information on the scale of a park than on the scale of a municipality, which concentrates resources and communication equipment. The park, in spite of its promotion tasks, does not seem to have any great tourist ambitions. There is little communication about lookouts, remarkable sites, points of interest, places to stay¹¹². The multiplication of websites, coupled with the absence of pages dedicated to the natural park on the various social networks, makes it difficult to access information. Unlike Peso da Régua, which invests in various networks and promotes tourism, the nature park does not communicate on its development actions, cultural events, or an application offering hiking or walking routes. And there is no publication of photos to invite people to come, which is however the basis of tourist promotion to attract people. The emphasis is rather on the preservation of the park and the quality of the landscape. However, the comments on the Google page show a good number of tourists and a good experience on site. The park authorities do not seem to want to rely on NICTs to achieve success.

The natural park, faced with the fame of the Douro Valley and its vineyards, classified as UNESCO sites, which absorb information and therefore digital visibility, seems to have step down.

Conclusion

The Douro Valley is a very dynamic and internationally renowned area, despite its landlocked nature. The Douro River acts as a powerful tool for territorial development, as man has developed it in order to alleviate natural constraints. The valley has many faces. The vineyard is one of the main ones. Indeed, the *quintas*

¹¹¹<http://www2.icnf.pt/portal/ap/p-nat/pndi>

¹¹²<https://natural.pt/protected-areas/parque-natural-douro-internacional?locale=pt>

and hillsides have historically structured the territory and the landscape. The history of part of the valley is linked to the growing of vine, creating its own identity, with ancestral know-how passed down from generation to generation. Landscapes and vines are at the heart of communication strategies put forward by local authorities on social media.

More and more public and private actors are investing in social media: Facebook, and more recently, Youtube and Instagram. The majority of publications are still in Portuguese, reflecting the fact that the main target audience is local and national. Nevertheless, some websites remain available in several languages. Focusing mainly on photos of landscapes, the river or vineyards, the publications demonstrate how dear the landscape, historical and gastronomic heritage are to the local population.

Wine tourism is used as the main lever for territorial development and tourist attraction, especially thanks to the fame of the *Alto Douro Vinhateiro*, a UNESCO heritage site. Other types of tourism are developing, such as outdoor tourism, with physical activities, as well as a certain museification of the history of Douro.

The use of ICTs is uneven, and it is sometimes difficult to access information due to the absence of certain institutions on social networks. With the subjective view of authors, travel blogs can fill this gap for the external user,. This inequality can be explained by the fragmentation of the valley: there is the Douro Valley and there is the Alto Douro Vinhateiro, at the centre of powerful dynamics of heritage, cultural and tourist promotion. Porto, one of the largest cities in Portugal, acts both as an outlet and a gateway to the Douro Valley, thanks to the river, a historic fluvial route, completed by roads and railways. If social media fill in the gaps of institutional sites. The promotion of the valley through communication tools is therefore a process still under construction.

CONCLUSION/SYNTHESIS

The study presented on the use of ICTs to enhance the tourist value of cultural sites highlights four types of comments.

1. An overabundance of information through ICT.
2. Ubiquitous and uneven pre-visit information through ICTs used as communication tools to stimulate the attractiveness of the sites
3. A very uneven presence of ICTs at the service of cultural sites
4. Institutional sites overtaken by visitors?

1. ICT allows for information overload

The four case studies reveal uneven rhythms in the use of ICTs in heritage/tourism links. It is clear that cultural operators as a whole have become aware over the last twenty years that new modes of communication based on the development of websites and, more recently, social media, have become a necessity in order to attract tourists who are keen on interactive and rapid information via new tools, particularly smartphones. In all the areas studied, coverage is abundant, sometimes overabundant and above all growing over the last 10 years, the phenomenon having also been reinforced during the COVID crisis since March 2020.

This abundance of information through digital networks is drowning out other forms of information, particularly for young people (paper tourist guides, books, etc.), even if they continue to exist. The abundance of this communication requires the Internet user to sort through the information in order to find the most relevant information, which is very difficult to evaluate.

2. ICTs showcasing sites: a tool for attractiveness

Prior information for visitors is more oriented towards these tools than in the past, with the most visible or reactive sites proving to be more attractive (Bruges). In this sense, in all four areas, institutional operators in tourism and culture sectors (local authorities, tourist offices, companies, museums, etc.) have taken on these tools in great numbers, and they have become important or even priority goals of their policies. However, the actions are very scattered and quite uneven, sometimes within the same town depending on the operators (Angers). The use of NICTs seems to be very dependent on the policies implemented by the heads of the institutions and the financial resources allocated to them. Few areas neglect this method of communication (Douro Natural Park). The communication policy on the institutions' websites or social networks has an openly economic goal aimed at capturing

potential audiences. It is impossible to evaluate the return on investment in the context of this study.

3. ICT A tool for the enhancement of cultural heritage

ICTs are also used in cultural spaces as a tool to enhance the value of heritage collections. The use here is twofold. It is a question of providing tourists with innovative technological experiences that add value to the visit, by adapting them to the diversity of the public. It can be observed that these tools do not replace the old ones (guided tours by lecturers, audio guides), but rather add to them. Secondly, these tools are used for a relatively short period of time, given the volatility of digital tools, which means that they have to be renewed frequently, requiring significant reinvestment. On these points, the financial study could not be conducted. Thirdly, digital technologies allow greater independence for the visitor within the site, particularly thanks to apps on interactive tablets or smartphones. In addition to information, the tools allow reconstructions of the past, of the disappeared heritage etc., which adds value to the visit. These tools, which are fairly simple to use, are tending to develop. Tools that are sometimes heavier (3D reconstructions, virtual or augmented realities, 4D films, etc.) are less numerous, as they are restrictive for the sites (investment, channelling of the visitor, etc.). However, they do have a certain attractiveness. Fourthly, the more recent the institutions are, the more they play the ICT card (Angers, Parc du Végétal), which can be explained by the more functional adaptability of the architectural spaces to these technologies and the training of staff anticipated from the design of the structure. Lastly, the use of ICTs sometimes makes it possible to continue the visit outside the site when the resource is adapted, which some visitors particularly appreciate. *In terms of quality, the use of ICTs makes heritage sites more attractive, especially when they allow for interactivity.*

4. institutional information outdated by users?

The qualitative and quantitative study revealed that sometimes institutional approaches were competing with, or even replaced by, feedback from visitors on social media or blogs or websites. The consequences of the recent trend of "stories", particularly on social media, and travel blogs, which appeared at the beginning of the 2000s and which have become widespread today, generate information flows which can complement, but also sometimes replace, the information provided by the institutions. In this sense, information has become overabundant from a quantitative point of view, but also from a qualitative point of view. It is up to the user to sort out the information themselves. Frequent and daily users of social media, especially the younger generations, may even use only these non-institutional sources.

All in all, the study of the four cases studied reveals that ICTs provide multiple and very varied information on heritage sites and the frameworks of the tourist offer

that surround them, both quantitatively and qualitatively. The abundance is such that it is difficult to measure how these tools are used: the information is very volatile and there is a limitless competition of professional operators and users alike to inform and/or enhance the object presented. Consequently, faced with a highly spread supply of information, the user has to sort through the flows themselves to access the tool that seems best suited to their needs.

The cultural and heritage institutions at the heart of this system often respond in an untimely manner, due to the speed of technological change, but it is imperative that they maintain a reactive presence, a dynamic of innovation, in order to guarantee information corresponding to the real offer. Cultural operators must be able to strengthen their cooperation and work in harmony with the political and/or tourist leaders of the areas around them, in order to maintain or enrich their potential. Reflection within each territory is essential, to avoid the risk of scattered, patchy, incoherent information with a negative impact.

Annex 1. Example of the main referencing tools using ICT: the case of Angers

The Château d'Angers:

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<https://www.connaissancedesarts.com/monuments-patrimoine/chateaux/google-offer-une-visite-virtuelle-des-chateaux-de-la-loire-1147121/>.
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- Pays de la Loire. Angers, Angers. Record attendance at the Castle in 2019, [On line]. Ouest France [Accessed 10 December 2020]. Available on: <https://www.ouest-france.fr/pays-de-la-loire/angers-49000/angers-frequentation-record-au-chateau-en-2019-dae7472e-3155-11ea-acff-2bdde1c14360>.
- Pays de la Loire. Angers, Angers. Patrimoine : "Castle attendance soaring ", [On line]. Ouest France [Accessed 10 December 2020]. Available on: <https://www.ouest-france.fr/pays-de-la-loire/angers-49000/angers-patrimoine-la-frequentation-du-chateau-en-forte-hausse-91b3514c-32ea-11ea-aafb-d94c5c60b7f7>.
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Annex 2 Santander

Santander's heritage sites on Airtable.

<https://airtable.com/tbl18nkvdB1Oc1nFu/viwjyg0rwqVmiZd4F?blocks=hide>

Evolution of the number of passengers at Santander airport between 2004 and 2016.

Evolución número de pasajeros en el aeropuerto de Santander desde 2004 hasta 2016 (en miles).												
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
342.559	644.662	649.447	761.780	856.606	958.157	918.470	1.116.398	1.117.617	974.043	815.636	875.920	778.318

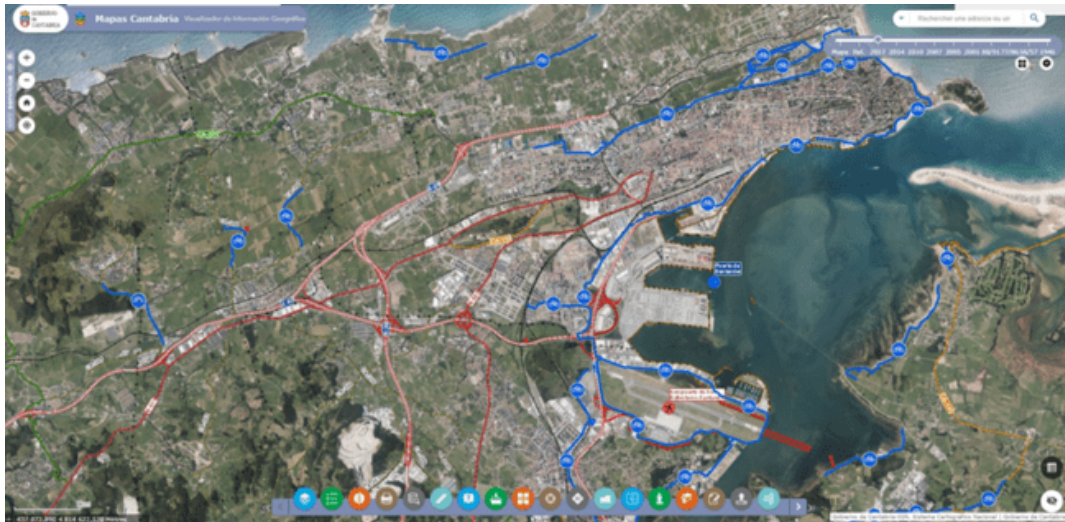
Fuentes: Informes AENA S.A., Estadísticas de tráfico aéreo, 2004 hasta 2016⁷⁶.

Evolution of the number of ferry passengers between 2004 and 2016 (in thousands of passengers).

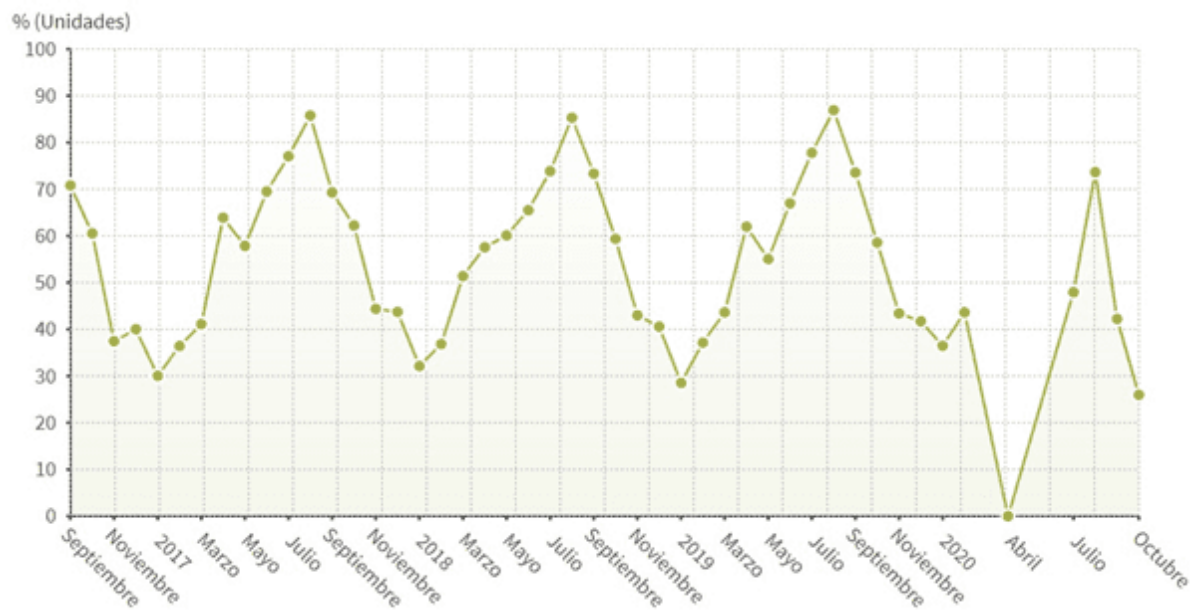


Fuente: elaboración propia con datos del ICANE⁹².

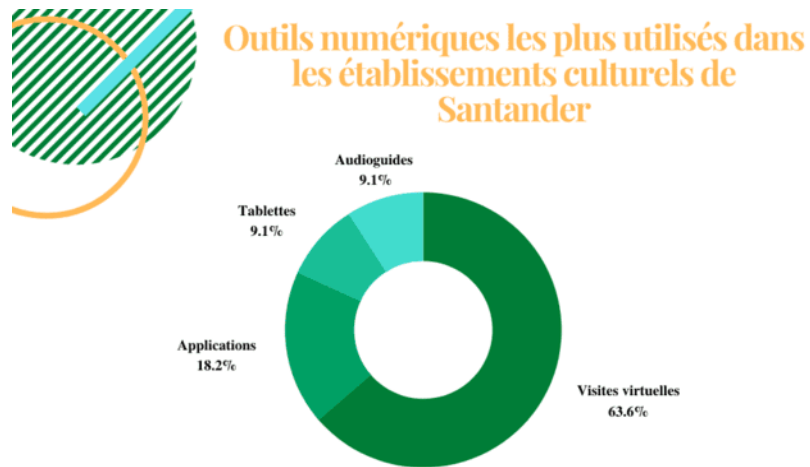
Main roads (red) and cycle paths (blue) in the town of Santander.



Hotel occupancy rates (September 2017 to October 2020). Source: INE.
www.epdata.es



Types of digital tools used in Santander's cultural institutions.



Source: Create from the inventory

Annex 3. Douro Valley

Inventory of heritage sites in the Douro Valley on Airtable.

<https://airtable.com/tblS4ZtTtSS5bRnoK/viwauS9PMHMDhPdNV?blocks=hide>

Evolution of the turnover of the hotel sector in the Douro Valley.



Source: Congress on the Impact of Tourism in the Upper Douro Vinhateiro Region

https://bibliotecadigital.ipb.pt/bitstream/10198/10716/1/Sousa%2BMonte%2BFernandes_Atas%20III%20CIT_IPC_A_Out2013.pdf