

Centre for Tourism Research, Development and Innovation (CiTUR)

11th INTERNATIONAL TOURISM CONGRESS

THE IMAGE AND SUSTAINABILITY OF TOURISM DESTINATIONS



5 - 7 NOV 2019
FUNCHAL | PORTUGAL

Proceedings Book





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Title ■ XI International Tourism Congress - *The Image and Sustainability of Tourism Destinations* (Proceedings Book).

Editing and Property ■ Centre for Tourism Research, Development and Innovation (CiTUR)

Printing ■ Online Edition ■ <http://itc.citur-tourismresearch.com/>

Editorial Board

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The Book is open access and double-blind peer reviewed.

Authors are responsible for the linguistic and technical accuracy of their contributions

*Financed by national funds through FCT - Foundation for the Science and Technology,
I.P. (UID / GES / 04470/2019)*

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TABLE OF CONTENTS

FULL PAPERS		
O impacto da Feira do Queijo de Seia	Adriano Costa, José Alexandre Martins and Zaida Ferreira	1
La influencia de los medios de comunicación en el turismo	Alba Barreth González and Jose Luis Proaño Moreira	14
La competitividad de Guayaquil hacia el bleisure tourism	Alba Caicedo, Enrique Santos and Luís Lima Santos	22
Caracterização dos consumidores do Museu de Portimão. Um contributo para o turismo cultural e acessível	Ana Rodrigues, Manuela Rosa and Efigénio Rebelo	36
Empregabilidade e Ensino Superior: o estudo de caso do mestrado em Gestão e Direção Hoteleira - ESTM	Ana Sofia Viana, Sónia Pais, Ana Elisa Sousa and Michael Schön	51
Are Alternative Accommodations a Threat to Hotels in Portugal?	Anabela Elias-Almeida, Cátia Malheiros Ferreira and Maria Sofia Lopes	63
Liquidity vs net income: an analysis of Portuguese hotel companies	Catarina Silva, Luís Lima Santos, Conceição Gomes and Cátia Malheiros	74
Turismo gastronómico: proposta de uma carta gastronómica para a região da Comunidade Intermunicipal das Beiras e Serra da Estrela	Cristina Rodrigues, Adriano Costa and Anabela Sardo	87
A satisfação e o retorno às festividades locais: o caso da Festa das Cruzes, Barcelos	Diana Faria, Laurentina Vareiro and Alexandra Malheiro	101
The City Next Door; Branding Alexandria, Egypt	Dina M. Weheba and Mohamed A. Nassar	116
Percepções do turismo e a relação residentes-visitantes: o caso do Porto (Portugal)	Diogo Cardoso, Raquel Mendes and Laurentina Vareiro	127
Strategies promoting hiking and cycle tourism in Greece. A case study.	Efthimios Bakogiannis, Charalampos Kyriakidis, Maria Siti, Christos Karolemeas & Efthymia Kourmpa	140
El agroturismo: una oportunidad para el desarrollo sostenible del sector agrario en la provincia de Los Ríos, Ecuador	Elisa Solís Argandoña and José Antonio Camúñez Ruiz	151
The Tourism Distribution in Portugal and Spain: an approach to its performance evaluation	Fernanda Oliveira and Conceição Gomes	161
Electric Mobility in a Nature Reserve in Portugal - Virtues, Conflicts and Tourism	George Ramos, Rogério Dionísio and Paula Pereira	174
Accounting for dissimilarities in hospitality costs among Portuguese regions	Íris Tourita, Conceição Gomes, Cátia Malheiros and Luís Lima Santos	189
A Madeira vista por Isabella de França: Itinerários Literários no Âmbito do Circuito Turístico	Isilda Leitão	202
CIVITAS DESTINATIONS Project promoting tourists' sustainable mobility in insular Regions	Joana Gaudêncio and Cláudio Mantero	219
Critical factors of success and innovation in the first organic tourism route in Brazil	Larissa Bigóis, Ana Claudia Padilha, Verner Luis Antoni & Marcelino de Souza	228
Determinantes do TRevPAR, uma análise dos hotéis portugueses entre 2010 e 2017	Maria Rolim, Cátia Malheiros, Conceição Gomes and Luís Lima Santos	244
Análisis del perfil y preferencias del turista chino que visita la costa de Ecuador	Rafael Arce Bastidas, Paul Freire Sierra, Elisa Verónica Solís Argandoña and Nadia Argudo Guevara	254
Are hotel companies creditworthy? The case of Portuguese hospitality industry	Ricardo Pãozinho, Luís Lima Santos, Conceição Gomes and Cátia Malheiros	267
Study of customer satisfaction with the hotel sector of the Principality of Andorra based on the reviews on Booking	Rosa M. Mariño-Mesías, Betlem Sabrià-Bernadó, Josep Fortó-Areny, Aleix Dorca-Josa	281

Repensar el marketing estratégico de la ciudad: Análisis del comportamiento de los portugueses seniors en el contexto del turismo de ciudad	Rui Martins, Alejandro del Moral and Michael Schön	291
Environmental Awareness of Surf Tourists: the case study of Peniche, Portugal	Sarah Springwald, João Paulo Jorge, Dulcineia Ramos and Ana Sofia Viana	302
Diferenciação do produto através da valorização do turismo industrial	Tânia Marina Ferreira Guerra, Maria Pilar Moreno Pacheco and António Sérgio Araújo de Almeida	319
SHORT PAPERS		
Using Data Analytics to understand visitors online search interests: the case of Douro Museum	Aida Carvalho, Arlindo Santos and Carlos R. Cunha	331
Analysis of the economic impact of Torre de Moncorvo's Medieval Fair for local development	Aida Carvalho, Joana Fernandes and Victor Moreira	337
Local products and gastronomy valuation for tourism and food sustainability in the Autonomous Region of Madeira	Bruno Sousa and Luís Mota	344
Regional products and typical dishes in restaurants in the Autonomous Region of Madeira	Bruno Sousa, Helena Pereira and Cármen Sequeira	348
The role of attachment in the choice of tourist destination of emigrants: a preliminary study	Bruno Sousa, Rossana Santos and Diana Azevedo	352
Avaliação das rotas turísticas em Portugal Continental: Uma análise de clusters	Carlos Vilela da Mota and Fernando F. Gonçalves	356
Mountain hikes and Levada practitioner's motivation and experience- Characterization	Catarina Fernando, Helder Lopes, João Noite, Ricardo Alves and João Prudente	363
A New Dimension on Sustainability of Tourism Destinations: The "Green Water" Program	Diana Foris, Adriana Tokar, Dănuț Marcel Tokar and Tiberiu Foris	368
The Impact of the European Wine City 2018 - Torres Vedras / Alenquer (CEV) in the local stakeholders	Dulcineia Ramos & Rui Penetra	372
Inventário, classificação e gestão de recursos turísticos: o caso do canyoning	Francisco Silva and Maria Céu Almeida	378
Hikes and Levadas in Madeira: Characterizing visitors and their experience	João Prudente, Helder Lopes, João Noite, Ana Rodrigues, Sara Vieira, Ricardo Alves and Catarina Fernando	385
The Identity and Genuineness of Madeira Natural and Cultural Heritage as Determining Factors for Sports Tourist Products	Jorge Soares & Naidea Nunes	390
Exploring Environmental Satisfaction in Tourist Sites: A View to Madeira Island	Luís Mota, Mara Franco, Agostinho Marques and Bruno Gaspar	395
Cultural dimensions impact on customer's expectations about the hotel service: application in different HDI Latin countries	Mara Franco and Raquel Meneses	402
Mariana Alcoforado and the making of Beja as a literary tourism destination	Maria João Ramos and João Rodrigues	408
Museu Virtual do Turismo (MUVITUR) © revela a história do turismo da Madeira (1930-2000)	Maria José Aurindo and Conceição Machado	414
Mapping Cultural Tourism Routes in Baixo Alentejo, Portugal: An Exploratory Study of the Municipality of Beja	Victor Figueira and Maria João Ramos	419
A imagem peregrina de Nossa Senhora de Fátima: uma marca do turismo religioso	Vitor Ambrósio, João Caldeira Heitor, Teresa Alves	425

Using Data Analytics to understand visitors online search interests: the case of Douro Museum

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Abstract

Regional museums are relatively recent museum structures that emerged in the late 19th century after universal exhibitions. They are museums specifically dedicated to the representation of a given population in a specific territorial context, highlighting the fundamental traits that characterize the nature and essence of that community, differentiating it from others. In northern Portugal, law no. 125/97, created the Douro Museum, a territory museum that represents the natural and cultural heritage of the demarcated Douro region, the first demarcated and regulated region of the world, in 1756, by Marques de Pombal, extending over an area of 250,000 hectares, between Barqueiros and Barca d'Alva along the Douro River and its tributaries. The museum has a “polynuclear structure distributed throughout the Douro region, based in Peso da Régua” (art. 2), serving as an element for mobilizing tourists, mainly through its main temporary exhibitions, videos, etc. In an information society, characterized by the empowerment of citizens with regard to their ability to independently obtain information and, in the process, to leave their footprint, it is crucial to understand and anticipate their interests. In this way, the supply and responsiveness of tourism agents and regional actors will be increased, making them better able to decide for an offer better suited to the real interests of visitors and even enable to influence them.

This article aims to know the profile of tourists / consumers through their online behavior, trying to understand what kind of information they are looking for, which keywords are most used and searched using the fundamentals of Data Analytics and using the Google Trends tool. Moreover, this study enables to better understand the connection between online search interests and the reality of the Douro Museum visitants.

This approach is nowadays a major contribute to bridge the gap between visitors needs/interests and tourism player's strategies definition, making Data Analytics a fundamental tool to enable decision support systems.

Keywords: Data Analytics, Douro Museum, Google Trends, Tourists, Tourism

1. Introduction

The tourism accounted for 8.2% of Portugal's Gross Domestic Product (GDP) in 2018, double that of 2009 (3.9%) (Turismo de Portugal, 2018), contributing strongly to the recovery of the Portuguese economy growth in all activity indicators. The main economic results of 2018 demonstrate the importance of the sector in the economy and the maintenance of its position as the main exporting sector. It is one of the most dynamic economic activities in the world and, in Portugal, follows this performance and, year after year, the economic relevance of the sector is becoming evident. In terms of demand, historic highs were reached: 66 million overnight stays (+ 1.7% over 2017) and 24.8 million guests (+ 3.8%), both indicators with the largest share of the foreign market, 70.3% and 60.4% respectively (Turismo de Portugal, 2018). According WTTC, in 2019 “the Portuguese Travel & Tourism sector will

grow by 5.3%, more than double the European average of 2.5%” (WTTC, 2019) and it is therefore essential to understand the demand of consumers for tourism-cultural products, among others, given the increased competitiveness of the sector. This information is critical to assisting cultural managers in decision making. According to a public survey, consisting of 13,853 valid questionnaires, of which 47% Portuguese and 53% foreign, applied to 14 museums supervised by the Directorate General of Cultural Heritage (DGPC, 2016), the answers indicate that six out of ten visitors were informed beforehand, visit to the museum, a practice more prevalent among foreigners (71%) than among nationals (48%). The vast majority of audiences used a single source of information (67%), while 28% used 2 or 3. Of these, the most common combinators highlight the internet (Internet / Museum Web Site; Internet / Tourist Route; Internet / Family) but also include other media such as Sightseeing / Family.

Building the profile of using the Douro Museum through its interactions and research is fundamental to ground new strategies to attract audiences and engage new institutional partners given the specificity of the museum that is simultaneously a territory museum, a unique region with strong differentiating factors. nationally and internationally, and a wine museum, as the vineyard, the wine and the landscape are part of the identity matrix with strong tourism potential and assets of high differentiating value. In December 2001, the Alto Douro Vinhateiro was awarded the title of World Heritage by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the category of living evolutionary cultural landscape. This wine region is located in the northeast of Portugal, bordered by the Douro River with an aerial of more than 28 thousand hectares. The granting of this status was only possible due to a set of peculiar characteristics and factors that make the place unique in the world. It is a traditional example of the human establishment of occupation of the representative territory of the vine culture. In this path, the Douro Museum was created, through law no. 125/97, of December 2, with the objective of promoting the entire wine region, and its limits of action are larger than the area classified as World Heritage. It is a Territory Museum, as an expression of the cultural identity of the Douro Demarcated Region, Community Museum, as it is an expression of the identity of the man who built, builds and maintains the landscape of this region and produces a wine of admittedly special characteristics. It is therefore also a Wine Museum. It is located in Casa da Companhia, one of the most emblematic buildings in the city of Peso da Régua. Later, on March 23, 2006, by decree-law no. 70/06, the Douro Museum Foundation was established. It is an institution governed by private law and public utility, with legal personality.

The Douro Museum, as an actor of the region's cultural, social and economic development, has been instrumental in its research, documentation, conservation and interpretation of the region's cultural and natural heritage, particularly in the Douro Demarcated Region heritage through a broad range of regular activities. Boosting a region depends, in many ways, on its ability to promote the region globally, as well as understanding the expectations that potential visitors have. In this domain, the role of technology and, in particular, Data Analytics, plays a key role in understanding visitors' expectations and consequently defining strategies that converge on an approach based on competitive advantages, differentiating approaches and value creation.

2. Literature Review

According to Jacobsen et al (Jacobsen & Munar, 2012), the tourist who wants to make a trip goes through three distinct phases: in the first, he tries to look for information about the destination; in a second, do the respective planning and, finally, in the third, live the experience. Each phase has a different behavior regarding the use of technology. According to a study presented by Google (Google, 2016), only 40% of tourists go through a destination search process, going from “dream” to “planning” and vice versa, until they get destination details and narrow down their travel options. In this information gathering process, the traditional desktop plays an important role, being used by about 60% of US users / tourists, using Google Search as their primary source as search engine to get a sense of the image of fate (Marine-Roig, 2017). This tool provides users with relevant information about destinations, making connections to web content, location, device, and time, giving rise to a data set that is critical to understanding user's interest in a place, destination, institution or other. By way of example, if you spell the term "Douro" on Google it generates a kind of big data that can be used in the study of human behavior to understand the connections with the place (Stephens-Davidowitz, 2013). These data are fundamental for the prediction of different areas, such as tourism (Volchek, Song, Law, & Buhalis, 2018), because their online interaction, whether through a search engine, a web site, a social media platform is

captured, stored and analyzed and is critical to assist in decision making. And, according to Yang et al. (Yang, Pan, Evans, & Lv, 2015), capturing the online behavior of tourists when using search engines, and then making decisions, has shown positive results in different industry sectors. And if we add the fact that Google Search, according to Statcounter (StatCounter, 2019), dominates the horizontal search engine segment, this statistic adds relevance to the results obtained from Google Trends (GT). In addition, Dinis et al. (2015), argues that it is an advantage using of the amount of data generated by the user generated by GT tool to obtain information that helps to understand user behavior. Although GT data is sample-based, and cannot be used to completely replace traditional analysis, it can nevertheless be used to formulate ideas and assist in decision making (Pedraza & Hernández, 2015).

3. Methodology

In this study we resorted to a Goal / Question / Metric (GQM) approach, with the definition of objectives, specification of questions and, finally, establishment of necessary metrics to answer the questions (Basili, 1994) of the object of study. To this end, we used the GT tool to understand the interest of Google Search users for the Douro Museum as well as the Douro region. Based on this information, a comparative study was performed with the number of visits, which corresponds to the user's real interest to validate the correspondence between these two environments: virtual and physical. In this sense, we searched the countries of origin and the terms and topics entered in the Google Search search bar for the region and the Douro Museum and how the user corresponded with the Museum and the region in the search process. In this research we considered only the data referring to the category "Travel" and alluding to the Google web search channel.

4. Results Discussion

This section presents the answers to the research questions previously stated, following the research work process with the GT tool. The purpose is to understand the terms and topics used by users who have expressed their intention to obtain any information about the Douro Museum or the region, as well as where the user did the research. Given the universe of possibilities, it was necessary to make methodological decisions in order to obtain the intended metrics. To this end, it was assumed to first analyze the interest in the Douro region and then the interest in the museum and what is the influence of the region to the museum and vice versa. Thus, the data were obtained using the comparative analysis methods provided by the GT tool, considering the related terms and topics, location, time period. In this study we resorted to a GQM approach, with the definition of objectives, specification of questions and, finally, establishment of necessary metrics to answer the questions (Basili, 1994) of the object of study. To this end, we used the GT tool to understand the interest of Google Search users for the Douro Museum as well as the Douro region. Based on this information, a comparative study was performed with the number of visits, which corresponds to the user's real interest to validate the correspondence between these two environments: virtual and physical. In this sense, we searched the countries of origin and the terms and topics entered in the Google Search search bar for the region and the Douro Museum and how the user corresponded with the Museum and the region in the search process. In this research we considered only the data referring to the category "Travel" and alluding to the Google web search channel.

4.1 Interest by the Douro Region

The analysis of the data shows that the degree of interest in the Douro region worldwide by typing the word Douro (single word or in conjunction with other words such as "Douro Valley") shows growth trend, according to INE's tourism income data (INE, 2018) as well as the interest in Portugal following an average growth level of approximately 40%, between the periods of 2012 to 2018. This growth was more pronounced from the year 2014, according to Figure 1.

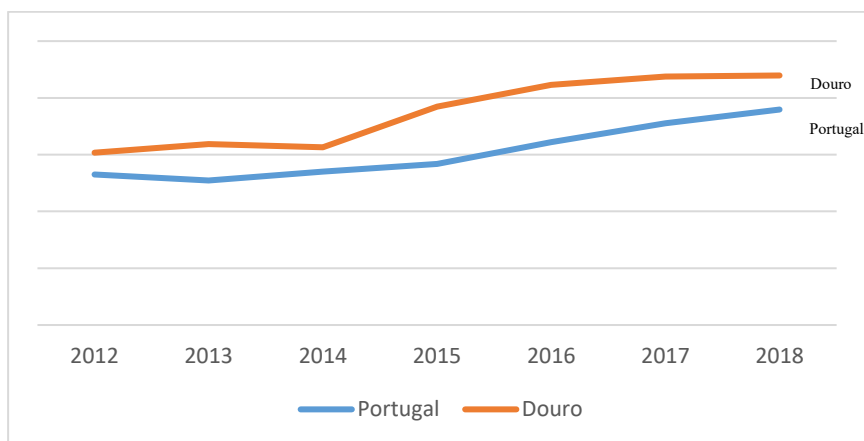


Figure 1 – Degree of interest in the Douro region vs Portugal

Source: Google Search, 2019

The 208-kilometer Douro waterway recorded a record passenger in 2017, accounting for about 1.2 million tourists on vessels crossing the river, up 35% from 2016, according to with the Douro, Leixões and Viana do Castelo Ports Administration (APDL, 2019). In 2016, 863 043 tourists crossed the Douro, spread over 85 vessels of 47 operators. In 2019, 61 operators with 149 vessels operate on the waterway, 20 of which hotel boats, with tourists mainly from the United Kingdom, Germany and France, who chose to travel in small boats, day cruises or hotel boats. So it is not surprising that the term “douro” and “douro azul” (Table 1), are the terms listed in the top 10 that generate the most interest worldwide by users in the Google Search. Douro Azul is the company oldest boat to sail in the Douro, emerging 25 years ago, with about 20 vessels on the river, between Rabelo boats, hotel ships and yachts. Its turnover in 2017 reached 31 million euros in the region alone, in 2018 41 million and in 2019 are estimated 51 million, according to CEO Mário Ferreira (Magazine, 2018). Soon after, there are terms related to the hotel supply (according to Table 1), which in the region has not stopped growing from 2009 to 2017 and increased from 35 to 154 units (PORDATA, 2019).

Table 1 - Top of related terms (GT)

Terms
Douro Azul
Douro Royal Valley Hotel & Spa
Douro Valley
Douro Hotels

Source: Google Search, 2019

According to INE (2018), the largest number of tourists visiting the Douro region are national tourists. However, around 22.8 million foreign tourists arrive in the Douro, including touristic from the Spain (the main market) with a 25.4% share, followed by UK tourists (15.5%), and third are tourists from the France (13.3%). Thus, in a comparative analysis across countries, it can be seen that the popularity of the Douro has been more popular among the Spanish and French and then in the United Kingdom. Perhaps, geographical proximity is the explanatory factor for the volume of research conducted by the Spanish.

4.2 Interest by the terms “Museums” vs “Museu do Douro”

Considering the entity under analysis, we chose to study the topic “Museum” regarding its degree of interest, in the Portuguese context and in the world context, comparing it with the interest in the topic “Museu do Douro” and the number of visitors. From the analysis of the Figure 2 graph it can be seen that interest in the topic “Museum” in the world context increased by 10% between 2014 and 2017, and

in the Portuguese context the interest in this topic follows the same trend, verifying 40% increase between 2014 and 2017. However, the degree of interest in the “Museu do Douro” does not follow the same growth trend of the topic “Museum”, either in the Portuguese context or in the world context. The growth curve in visitor numbers is also unrelated to the degree of interest shown by cybernauts, but the degree of interest is almost constant. The number of visitors is above, and there was an 8% increase in the number of visitors to the museum's exhibition areas from 2012 to 2013. However, there was a very significant decrease in the years. Perhaps the result of the deterioration of the country's macroeconomic conditions that inevitably affected the consumption of cultural goods, has improved in the last two years, 2016-2017, by around 14%, but well below interest in topic museums.

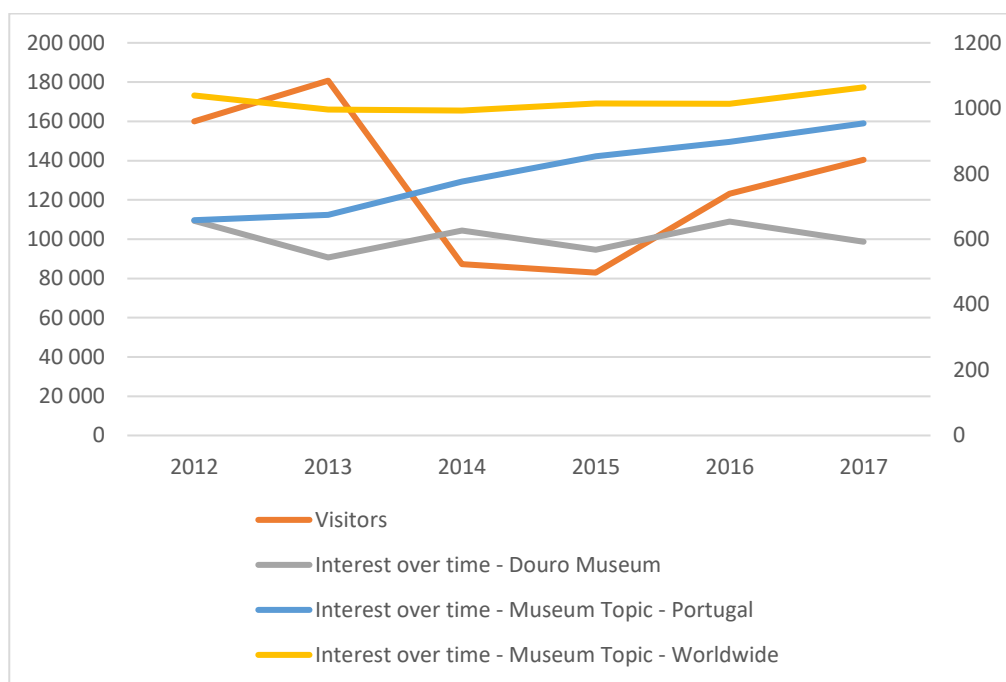


Figure 2 - Degree interest in the topic “Museu do Douro” and Museum Topic vs number of visitors

Source: Google Search, 2019

5. Conclusions

These preliminary results provide statistical evidence that tourists use search engines to plan primary and secondary attraction visits near or during the trip. Moreover, the data that results from the digital footprint of users in the virtual world, when interacting in this world, when searching for information for decision making, leaves a record of their interaction. In addition, when this task takes place in the web context, in the Google Search search engine, it is possible to make use of the data captured from these interactions, through the GT tool to obtain information and knowledge about consumer / tourist / visitor behaviour. Taking advantage of this tool, and after the conclusion of the study phase, it can be concluded that, in general terms, the main users using the search engine and the web search channel are the users who do not build a visible association between the region and the museum. And although tourism in Portugal, and in the Douro in particular, knows moments of growth, there is no such growth in the degree of interest shown through the search engine. And the number of visitors also does not reflect this current trend. There is also a low volume of research related to the Douro Museum, and these are essentially from users who know the Museum very well.

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