

Exploring the Cognitive-Affective-Conative Image of a Rural Tourism Destination Using Social Data

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Abstract

The Tourism Destination Image (TDI) has been usually studied by conducting tests with individuals visiting the destination for which the TDI is being constructed. This paper explores the structure of the cognitive, affective and conative components of tourism destination image using social data. Then, it reports the progress in the implementation of a pilot system for the study of TDI using data extracted from social media which is being built using the SLOD-BI semantic infrastructure for a use case involving Vilafamés, a rural tourist destination in Eastern Spain.

1 Introduction

Although there are a variety of different interpretations for the concept of Tourism Destination Image (TDI), it is commonly recognized that the TDI is “the sum of beliefs, ideas, and impressions that a person has of a destination” [1]. Moreover, the TDI is also commonly accepted as an important aspect in successful tourism development and destination marketing due to its impact on the supply and demand aspects of marketing [2]. Therefore, there is consensus on the importance of the TDI for a destination viability and success.

In the past, the TDI was studied as formed only by cognitive components, but nowadays it is agreed that the TDI is a multidimensional overall impression formed by distinctly different but interrelated components, namely *cognitive*, *affective*, and *conative* [3]. The first one concerns beliefs and knowledge about the perceived attributes of the destination; the second concerns the individual’s feelings towards the destination; and the third is related to action: how one acts using the cognitive and affective information. But there is also a lack of homogeneity with respect to the attributes relevant to measuring TDI. From the cognitive point of view, the image attributes correspond to the resources or attractions that a destination has at the visitor disposal, such as: variety of fauna and flora, beautiful landscapes, beautiful natural parks, pleasant weather, attractive beaches, hospitable people, opportunities for the adventurous, place to rest, rich and varied gastronomy,

interesting cultural activities, safety, quality of accommodation, easy accessibility, and so on. On the other hand, the affective image dimension corresponds with the emotions that the destination evokes in the tourist, e.g. if the destination is arousing, sleepy, distressing, relaxing, gloomy, exciting, unpleasant or pleasant for the visitor. And finally, from the conative point of view, attributes can be the individual’s actual intention to revisit and recommend the destination to others, or even to spread positive word of mouth.

In the literature, the TDI is explored by having visitors fill in questionnaires, usually when they are leaving the tourist destination [4-8]. This process has several drawbacks, e.g. getting correct test results when people are in a hurry, or getting objective answers just when the visit has finished when, for instance, a momentary bad feeling due to a last-minute issue just before taking the test, or getting a big amount of data which can be representative enough of the people visiting the area. Moreover, nowadays, tourists rely increasingly in the collective intelligence that can be found in social networks¹. Therefore, it is important to find a new way to explore TDI considering these factors, and this is the main purpose of this paper: to explore the cognitive, affective and conative components of TDI using social data. The study will be centered in the case of rural tourism, specifically in the rural tourism of a small village in Spain, named Vilafamés², where there is a high interest in developing rural tourism in the area. The research procedure that is planned to follow consists of the following steps:

1. Study how to create the infrastructure needed to get social data and be able to analyze it.
2. Study which are the most used attributes to measure each component of the TDI (cognitive, affective and conative) [9-11].
3. Select the most useful set of attributes for the case of study, and from this set define a model to capture their values from opinions of tourists in social networks. The model has to learn how to detect that a user is talking about some of the attributes that are under study and how to rate the opinion of this user about the specific attribute. Therefore, this step includes several main processes of the work:

¹ Examples are TripAdvisor (www.tripadvisor.es), viajeros.com (www.viajeros.com), Toprural (www.toprural.com/), etc.

² <https://www.lospueblosmasbonitosdeespana.org/comunidad-valenciana/vilafames>

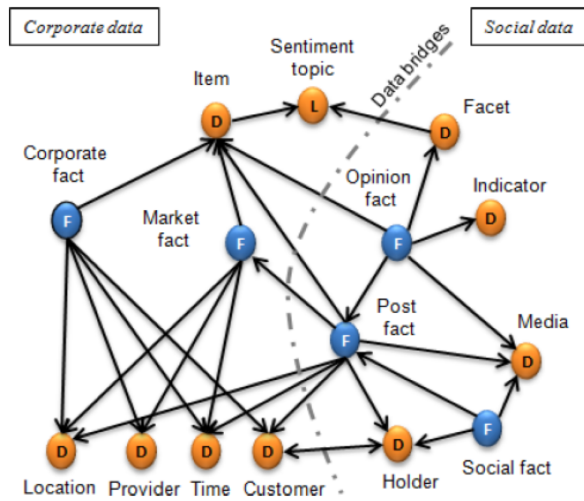


Figure 2: BI patterns in SLOD-BI

- a. Detect the main social networks from which it is possible to get tourists opinions.
- b. Determine when the opinion of a user is related to an attribute under study.
- c. Define a measurement scale for each attribute.
4. Gather relevant social data for the case of study.
5. Develop a tourism sentiment analysis process for the concepts related to the affective component [12-13].
6. Combine and analyze all the data in order to set an overall TDI of the case of study, and generate recommendations for improvement [14].
7. Conclude whether the analysis of social data is possible and useful for creating the TDI of a tourist destination.

The next sections present the first steps of some of the points in this plan. Next section presents the infrastructure used to get and gather the social data and outlines how the sentiment analysis of the opinions is going to be done. Section 3 presents the social networks that are going to be used, and the most used attributes to measure each component, and how some of them can be gathered from the social networks. Finally, we conclude with an outline of future work.

2 The SLOD-BI Infrastructure

We will adopt the SLOD-BI infrastructure [15], which provides support for the considerable technical challenges required by the research procedure sketched in the previous section.

SLOD-BI incorporated facilities for the large-scale processing of opinion data extracted from social media. It provides a data model based on *BI patterns*, which abstract the data required for analysis of social media into a set of generic facts and dimensions. The key patterns for our use case are *Post facts*, which contain information about a textual posting

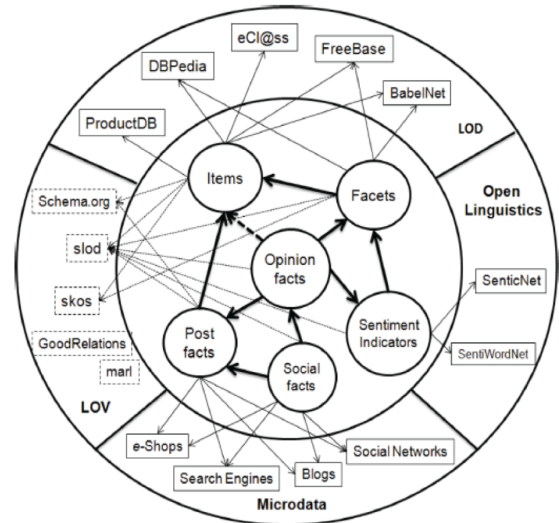


Figure 1: Structural view of SLOD-BI

in an online source that may contain opinion information. *Social facts* group contextual information about the post facts that will help assess its impact, such as the number of items the opinion has been shared, or the number followers of the author of the post. Finally, *opinion facts* contain the results of an automated sentiment analysis computation, including the object and facets that are being opined about, and the polarity of the opinion (positive, negative or neutral). Figure 1 shows the relationship between these social facts, and how the SLOD-BI model also allows the integration between social facts and corporate data, which includes internal company data and external resources such as relevant economic indicators.

Populating a data model such as this requires strong data integration capabilities. SLOD-BI adopts the LOD (Linked Open Data) paradigm [16], which provides significant advantages in this respect. First, LOD is based on standardized, very expressive data models that facilitate integration among disparate sources. Second, LOD provides ready access to the multitude of large, compatible data sources which are publicly available; Figure 3 shows some examples. Finally, it provides powerful methods to publish newly created information, thus allowing for the creation of a rich ecosystem of services around the SLOD-BI model.

Figure 3 shows the functional architecture of SLOD-BI, illustrating how the source data is progressively processed, with the final goal of building decision support systems based on analytical tools, predictive models and exploratory interfaces.

3 Progress status

3.1 Requirement elicitation

As a first step, we contacted interviews with both tourism-related public and private stakeholders (tourism officers,

Social network	Type	Size (in millions)	Opinion information?	Public API
Facebook	General	1600	Yes	Yes
Twitter	General	320	Yes	Yes
Minube	Tourism	1.6	Yes	Yes
Toprural	Tourism	18	No	Yes
Tripadvisor	Tourism	340	Yes	Yes
Couchsurfing	Tourism	4	No	No
Yelp	Tourism	135	Yes	Yes

Table 1: Relevant social media data sources

owners of tourism-oriented companies, and local government authorities related with tourism management.). This allowed us to gather necessary data to get information about market positioning, and future expectations.

3.2 Data sources

We did a preliminary study to select the relevant sources of information. We included:

- 1 General social networks on which there is a significant presence of local tourism-related organizations. These are Facebook and Twitter.
- 2 Tourism-specific social networks, extracted from the social media directory at [17], which includes relevant social networks in the Spanish context. These include Minubre, Toprural, Tripadvisor, Couchsurfing and Yelp.

We searched for the availability of Vilafamés-specific tourism-related opinions on each of these social networks. We also checked the availability of a public API that would allow the incorporation of information from the social network into the SLOD-BI infrastructure.

The results of this analysis are presented in Table 1. The selected social data sources were Facebook, Twitter, Minube, TripAdvisor and Yelp.

3.3 Initial data gathering

After selecting the data sources, we performed an exploratory analysis of them. First, we studied the hashtags related with the small village (Figure 4), and then a more exhaustive analysis of the type of information found in each source has been conducted. For instance, Figure 5 shows an example of the information a tourist can find when asking about accommodation facilities in Vilafamés.

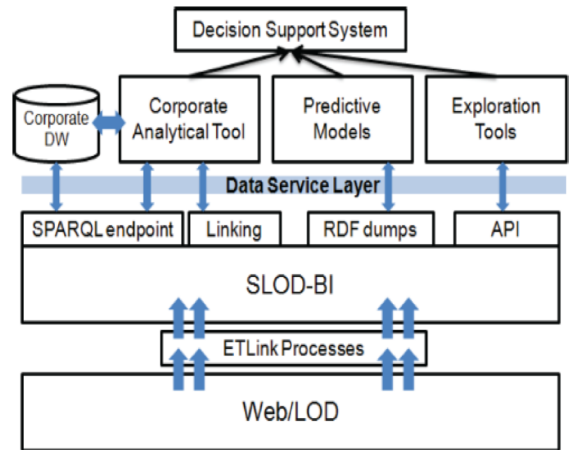


Figure 4: Functional view of SLOD-BI

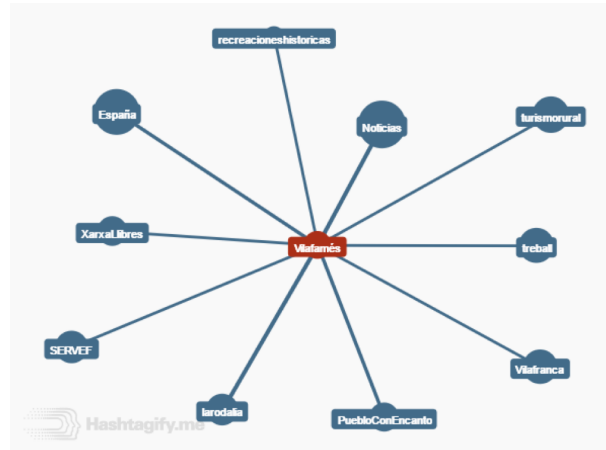


Figure 3: Related hashtags to Vilafamés in the Twitter social network

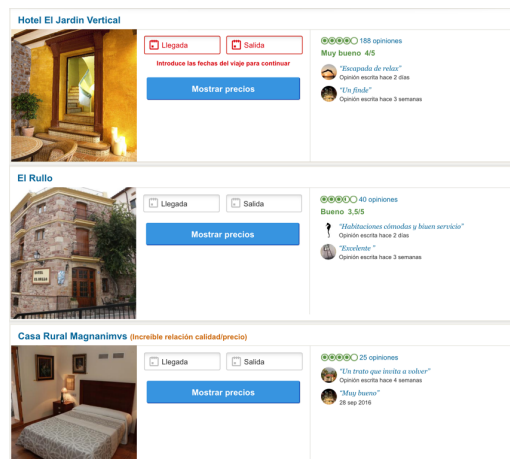


Figure 5: Example of Tripadvisor information about Vilafamés

Dimension	Item
Cognitive	Good climate
	Beautiful landscape
	Great variety of plants and animals
	Good quality of infrastructure
	Availability of accommodation facilities
	Convenient to get tourism information
	Various shopping opportunities
	Relaxing/avoidance of daily routine
	Interesting cultural attractions
	Interesting historical monuments & events
	Good facilities for sports training
	Nice opportunities for biking/hiking
	Appealing local food
	Safe place to travel
	Easily accessible from permanent residence
	Family-oriented destination
	Standard hygiene and cleanliness
	Friendly and hospitable local people
	Good reputation
	Unpolluted natural environment
Satisfactory customer care	
Nice opportunities for wine-tourism	
Cost- price levels	
Affective	Pleasure
	Arousal
Conative	Intention to recommend
	Positive word of mouth
	Intention to revisit

Table 2: Items for each TDI's dimension

3.4 Relevant TDI indicators

From a literature review, and given the case of study under consideration, we have chosen the items shown in Table 2 for studying the cognitive, affective and conative dimensions of Vilafamés's TDI.

The three dimensions under study are related, and each one of them contribute to the formation of a global image that is considered to be greater than the sum of its parts, and this is used by the consumer to simplify the task of decision-making.

On the other hand, as stated in [6], both affect and cognition are mental responses to environment stimuli, which are interrelated and form a dynamic and interactive system; the cognitive and the affective dimensions significantly influence the conative image of a destination, and the affective dimension also mediates the relationship between the cognitive and the conative dimension of a TDI. Therefore, it is a complex system as a whole and we have to study all the dimensions.

As first steps, for studying the dimensions of the village we have collected opinions of users as the ones shown in Figure 5 and we have carry on a sentiment analysis of them. The result of this task determines: the language of the opinion, the polarity of the general opinion, and the facets detected. We are yet working on the detection of the facets or features about what the opinion is talking about. The facets study is still under development in order to determine which will be the final facets considered when opining about a TDI and how determine the polarity (positive, neutral or negative) of all of them. The facets have to be defined taking into account the items of the dimensions. For instance, below we present the result of this sentiment analysis task done for some sentences extracted from TripAdvisor about Vilafamés. For all of them the system has determined that they are written in Spanish, in the sentences the facets are highlighted using italics. For the two first sentences the analysis returns a positive polarity and for the last one a neutral one.

"Escapada de relax. Trato muy agradable tanto de la propiedadaria como del servicio, una señora brasileña muy simpática. La habitación muy amplia y limpia. Lo mejor el desayuno "perfecto". El pueblo precioso e idílico! Volveremos...."

"Acabamos de estar en el hotel la habitación amplia y todo muy limpio un poco cara precio / calidad anoche cenamos en el restaurante y lo mismo caro precio / calidad , pero el desayuno ha sido una pasada fantástico de todo dulces y salado en cantidad y calidad y un 10 a los bizcochos caseros yo volvería a ir solo por volver a desayunar"

"Pasamos una noche en el Hotel el Rullo y quedamos muy satisfechos. Las habitaciones son cómodas y estaban limpias. No podíamos pedir más. El único inconveniente que tuvimos fue el desayuno. Es un desayuno fijo, muy bueno todo, pero tardaron 30 minutos de reloj en servirnos el café, el zumo y las tostas en la mesa. Sólo había una chica sirviendo los desayunos más quien hubiese en la cocina, pero claro estaba que no daban a basto. Deberían mejorarlo, sobretodo en épocas con más afluencia de huéspedes. Por lo demás, nos fuimos contentos."

4 Conclusions and Future Work

We have started the research methodology to determine the Tourist Destination Image (TDI) of a small village, Vilafamés. First we have determined the three dimensions to study, the cognitive, affective and conative dimensions, their relations and the items to be studied for each one of them. The social networks to be used for this analysis have been also determined and the SLOD-BI architecture has been selected for developing the whole system. The initial sentiment analysis of the opinion has been presented too.

Now, there is still a lot of work to be done in order to get the final TDI of Vilafamés. We have to finish yet the facets definition from the opinions, and it is necessary to associate also a sentiment for each facet. Then it is necessary to combine all the information gathered from the different social networks for each facet and dimension, to allow analysis on the global data. Also it is interesting to detect communities in the network connection graph and to determine which it is the most suitable way to visualize all the data in order to be useful for tourism decision-making.

Acknowledgements

This work has been partially supported by the Andalusian Regional Ministry of Economy (project SIMON TIC-8052), the Spanish Ministry of Economy and Competitiveness (project TIN2014-55335R), Generalitat Valenciana (project GVA/2015/102) and Universitat Jaume I (project P11B2013-29).

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