

# An Analysis of Mobile Applications Classification Related to Tourism Destinations

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**Abstract** The widespread use of mobile devices in daily life activities has impelled a growth in the development of applications (apps) for different purposes. Tourism is one of these spheres of activity in which mobile apps have been developed to support visitors. However, there is not enough understanding of the features that foster the relevance or popularity of a tourism app. Consequently, this paper will analyse the features of specific destination-related apps in Google Play. This analysis will shed some light on generic features of these applications in order to identify potential patterns that correspond to better positioning in searches related to the selected destinations. With this purpose, the research has performed a daily automatic massive collection of data by means of a crawler. Obtained results will provide a brief overview of the characteristics of the most successful applications and could provide some insights in the design and development processes of tourism mobile apps.

**Keywords** Mobile applications · Statistical analysis · Quantitative analysis · Tourism · Destination

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## 1 Introduction

The current convergence of the social, physical and virtual realms is boosting a change in the ways humans interact with their environment (Bloem et al. 2009). Daily activities have been eased by the mediation of technologies. Thus, an increasing number of people are taking advantage of the benefits of technology support. An example of this phenomenon is the change in how people use the Internet. A few decades ago, mobile Internet connection was very scarce. Consequently, information was accessed and consumed primarily from desktop computers with a land-line Internet connection. The recent technological development, however, has enabled the rise of the so called *Internet of Things* paradigm, in which devices are connected to the Internet, currently allowing 1.6 billion people to have constant access to information (Jara et al. 2013). Within this paradigm, the consumption of information in mobility has become a common thing, since it can effortlessly be done from any place and time. In fact, the estimation of mobile users is about four billion people, of whom 570 million utilize Internet-enabled mobile devices (Jara et al. 2013).

The proliferation of these new high-end mobile devices, commonly known as smartphones, has altered the way people access and consume information as well as how they interact with other individuals and their environment. Currently, mobile devices integrate various real-time positioning systems that have enabled the creation of advanced time and space contextualized services (Martín et al. 2013) and the consequent transformation on the access to information while on the move (Want 2009). Due to the intensive use of these kinds of devices and the natural interaction of users with the virtual world, some authors advocate for the existence of a so-called *Smartphone's generation* (Siewiorek 2012).

The impact of these mobile devices in the field of human mobility and tourism is particularly relevant, since the access to information is supposed to be helpful for users (Berger et al. 2003). These mobile systems are key for the consumption of huge amounts of information with no time or space boundaries. Therefore, the access to information can be linked to the precise time and place (i.e., context) of the users and become key to fulfil their needs (Lamsfus et al. 2013). This fact implies a change in travel behaviour within a destination (Okazaki et al. 2011). Currently, individuals have the means to manage and support their decision making processes throughout the trip, because this new situation allows them to book a flight, choose a hotel or check a list of events in real time. Furthermore, the information concerning the context in which apps are used can be exploited to generate more detailed knowledge about visitors' mobility at the destination. This could be used as evidence to support destination managers in their decision making processes (Shoval 2008).

Thus, taking into account the growing importance of mobile apps, this paper aims to analyse the most popular ones linked to tourism destinations. This analysis will identify some potential common features of description and classification of these applications. The paper is divided into five different sections. The first section is an

introduction in which the scope of the study is defined. Section two deals with the state of the art on the work performed in the field of mobile applications. This part of the paper emphasises existing works related to the classification of apps linked to the tourism sector. The next part of the paper deals with the use case selected and briefly describes the tool developed to capture data about the apps. Section four performs the analysis of the obtained data that will guide the final section of the paper, where some conclusions and further steps to be taken are highlighted.

## 2 Background

In light of the above facts, recently there has been a proliferation of research works dealing with information of mobile apps and their usage patterns. Some of them analyse massive captures of information from applications related to travelling (Wang et al. 2011, 2012; Wang and Xiang 2012). These works mainly focus on the analysis of users' comments about some selected apps. Overall, it seems that the scientific community in this field has primarily drawn its efforts to identify potential categories to classify tourism-related mobile apps. Thus, Martín-Sánchez et al. (2012) for example, have identified the categories of transport planning and travel guides, translators and communications in the realm of tourism. On the other hand, Kennedy-Eden and Gretzel (2012) identified a higher number of categories, among which entertainment, information, transactional, security, marketing, social and navigation can be cited. Finally, Grün et al. (2008), have identified the categories of accommodation, security, entertainment, food, navigation and guidance, news, practical information, shopping, sport, tourist attractions, transportation and time for apps linked to tourism.

As can be seen, each of the studies cited above follows different categories to classify the selected apps. Therefore, the lack of a standard categorisation for tourism apps makes it difficult to study their use, since apps could be categorised in highly transversal broad categories concerning different topics. Being it so, the works that have been reviewed allow some room for research. This paper proposes to link classification of categories and download data to searches about some selected tourism destinations. Analysing this fact, results will show if the most successful apps for tourism destinations share any kind of characteristic or if there is any pattern in the classification of these applications. Therefore, this paper will explain the connection between the apps and the destination they are linked to.

## 3 Use Case

In order to achieve this paper's objectives and perform the necessary analysis, it is necessary to collect as much information as possible about the currently available apps. Since the existence of multiple app markets makes it difficult to analyse all

of them, this work has focused just on Google Play.<sup>1</sup> This specific market was chosen because of its popularity and simple Web access. Reports indicate that Android is the most common operative system worldwide and its market share is predicted to increase in the coming years (Gartner 2013). Other app markets were disregarded for this analysis, either because they have a less significant market share, or because their access is more complex and makes it difficult for an automatic process to collect data from them. Hence, the analysis has focused on the apps accessible via Google Play in its Spanish version.<sup>2</sup> Due to the high number of apps in that site, the analysis has been restricted to the first page of results of the performed searches, as will be explained later. For each search, this page of results displays the 24 most relevant or popular apps.

The multiple searches that were performed and analysed daily produced a significant amount of data. Moreover, the variation of the results for each search and the position of the apps in the Google Play ranking, suggested that in order the results of this work to be more comprehensive a longer period of time had to be considered to perform the search and the analysis. Thus, the manual analysis of the apps and searches was immediately disregarded and an automatic crawler was specifically developed to support these processes.

In any case, the first step of the search process has to be carried out manually. This step consists of an identification of the URLs corresponding to each destination and options provided by Google Play that had to be later analysed. Once the URLs have been identified, they are stored in the database (see Fig. 1).

Then, the crawler accesses the database to collect the previously saved URLs. It visits these websites and retrieves their source code. The link to the website of each app is to be found in this code. The crawler identifies this link and accesses the apps' website in order to retrieve the website's source code. The source code is an HTML code page including all the app-related information. This code is based on tags, and using these tags the crawler is able to read and understand all the information, extract the necessary data and store it accordingly in the database.

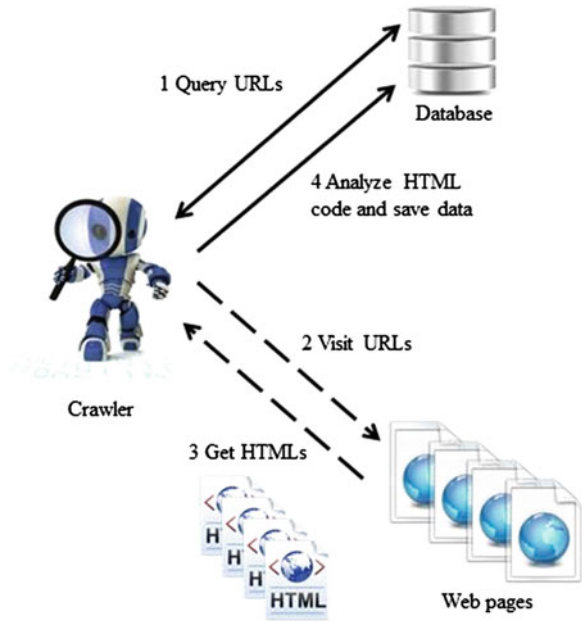
The crawler gathers, apart from the name of the application, all the quantifiable information present in Google Play. Therefore, description of the application and users' comments were not included, as these data would not be suitable for the designed analysis due to their qualitative character. Considering this paper represents just an initial step of a broader scope project, the following information was gathered: name of the application; category of the application; number of received votes from the users; date of last update; number of minimum version required; range of downloads; size of the application; price of the application; mean of the value of the received votes; performed query; ranking of the application in the performed query; and date of the query. The analysis has focused on the category selected by the developer when uploading the application to Google

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<sup>1</sup> Google Play: <https://play.google.com/store/apps>. Last access: 24 June, 2013

<sup>2</sup> This is the predetermined version of Google Play according to the location of the researchers.

**Fig. 1** Architecture of the developed crawler



Play,<sup>3</sup> the mean value of the votes of users, the range of downloads, the price of the apps and their ranking. The selection of these data has been made to answer to the objective of the research. In other words, the analysis of these data will identify if there is a predominant category in the results of the different searches, as well as the popularity of the diverse applications.

The collection of the data was performed between May the 24th and June the 23rd of 2013 and the locations for which data was collected are the Basque Country, San Sebastian, Vitoria and Bilbao. These terms have been chosen, because in this first stage the analysis has been limited to the Basque Country. This selection has been based on the knowledge of the area by the researchers. Consequently, results obtained from the analysis will be valid for this area and any extrapolation should be cautiously done. So as to take into consideration the linguistic diversity of each of the destinations and the visitors themselves, all the nomenclatures of the places have been included in Basque, Spanish and English. Accordingly, these are the selected search terms for the destinations: Euskadi, Basque Country, Pais Vasco, Donostia, San Sebastian, Vitoria, Gasteiz and

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<sup>3</sup> When uploading an app to Google Play, the developer has to classify it according to one of the following categories: Arcade and Action; Books and Reference; Brain and Puzzles; Business; Cards and Casino; Casual; Comics; Communications; Education; Entertainment; Finance; Health and Fitness; Libraries and Demo; Lifestyle; Media and Video; Medical; Music and Audio; News and Magazines; Personalization; Photography; Productivity; Shopping; Social; Sports; Tools; Transportation; Travel and Guides; Weather.

Bilbao.<sup>4</sup> For each of these terms, multiple searches and collections of information have been carried out in Google Play. That information has been collected in order to identify different patterns of presence of the apps according to the category where the search has been performed. Google Play allows performing searches based on the relevance, the popularity<sup>5</sup> and the price of the apps. According to a previous exploratory approach, there are differences between these searches and, therefore, the following options of search have been considered in the research: relevance, popularity, relevance of free apps, popularity of free apps, relevance of paid apps and popularity of paid apps. Therefore, the total amount of searches done each day has been 48.

Each search process provided about a thousand new entries daily. During the selected period of time, the total amount of entries has been 30,736, with an average recollection of 641 entries per query or 992 entries per day.

The results obtained from this research will shed some light on the optimal strategies to name and classify tourism and travel content-related apps in order to gain a better place in the increasingly competitive current panorama.

## 4 Data Analysis and Discussion

Considering the information stored in the database, a statistical analysis has been carried out using IBM SPSS Statistics 19 in order to verify if the objectives of the paper are covered. The analysis of data has consisted of the calculation of the frequencies of the selected abovementioned selected information by query. Following, some general aspects of the searches and their results will be explained. Then, a tourism apps-related analysis of categories will be executed.

When analysing the number of apps returned in each query, some differences can be highlighted. In general terms, the number of different paid apps in each query is lower than the expected maximum number of 24 for the first page of the results of Google Play. That is to say, in every case, except for the terms *Bilbao* and *San Sebastian*, the number of paid apps both by relevance and popularity is lower than 24. So, it can be stated that the development of paid apps related to the terms of search for the selected destinations is not yet fully consolidated. This implies that developers tend to create more free applications than paid ones. When looking at the case of the query *Donostia*, even the free apps by *relevance* and *popularity* are lower than this number. This phenomenon expresses that the

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<sup>4</sup> An exploratory approach to the differences between the terms Bilbao and Bilbo has shown that the differences are great, because at the time the crawler was implemented the applications responding to the search Bilbo were mostly linked to “The Lord of the Rings” and its character Bilbo Bolson. For this reason, it is the only destination without a search term in Basque.

<sup>5</sup> The relevance of a search refers to terms that appear in the description of an application and repetition rate of those terms. Popularity, on the other hand, looks for the number of incoming links referring to the specified term of search.

applications that fulfil the specified requirements of the searches are low. Or, in other words, the investment in applications that have the term *Donostia* in the title or the description is lower than the one made for the other terms. Regarding the analysis of the variation on the number of apps in the first page of the Google Play site, disregarding the queries that return a low number of applications (i.e., fewer than 24), the query with the term *Bilbao* seems to be the most stable one, with 24–26 apps in all the cases. Meanwhile, queries containing the term *San Sebastian* present the highest variation with values ranging from 28 to 30 different apps. The stability of more widespread and popular applications is more common than for other apps with a more limited reach in number of downloads and popularity. Since the results of Google Play are based on downloads, votes and relevance, the higher the scores in these variables, the more difficult to be overtaken by another application in the ranking. Therefore, it will be more difficult to become an application that appears in the first results in Google Play for these ones dealing with terms for destinations with more stable apps. For instance, apps responding to the term *Gasteiz* will easily become relevant or popular due to the low number of applications and their relatively low number of downloads than the ones with the term *Bilbao* or *Basque Country*.

Attending to the user valuation of the apps of each query, there are significant differences among the diverse searches. The valuation of each application in Google Play is made using a star ranking system. Each user can give between one and five stars to each application. Generally, free apps score a mean higher mark than paid ones in all the categories. Looking at the global values, the lowest ones are scored by the group of applications of *San Sebastian paid relevance* and *San Sebastian paid popularity* (1.69), followed by *Vitoria paid relevance*, *Vitoria paid popularity* (both scoring 2.28), *Donostia paid relevance* and *Donostia paid popularity* (scoring 2.44 in both cases). Contrarily, the highest scores have been identified in the queries *Basque Country popularity* (4.34), *Euskadi popularity* (4.28), *Euskadi free popularity* (4.21), *Vitoria free popularity* (4.21) and *Vitoria popularity* (4.20). Remarkably, the searches of the term *Vitoria* show dissimilar scores between the free and the paid apps. These facts might express that, in general terms, users' expectations with paid apps are higher than the expectations for free ones and, therefore, scored results are lower.

Finally, the difference of downloads when comparing merely *free* or merely *paid* apps is noteworthy, being the most common range of downloads of the latter 10–50 and of the first one 1,000–5,000. In fact, the lowest range of downloads of the free apps is 100–500. Actually, in the case of the San Sebastian query the *paid* categories have the lowest most common range of all downloads (1–5), but the *free* ones have the highest most common range of downloads (10,000–50,000). Therefore, the research has detected that users are more willing to utilize free apps than *paid* ones. This trend might suggest that, in order to be relevant or popular, tourism related apps would better be free.

In addition, a frequency analysis of the data stored in the database has been performed in order to identify the most common categories assigned by the developers to their applications. This analysis will determine if, for these specific

**Table 1** Categories of apps in each query and percentage of presence

	Relevance			Free relevance			Paid relevance		
	Category	Percentage		Category	Percentage		Category	Percentage	
Euskadi	Lifestyle	18.7		Travel and guides	20.8		Weather	28.6	
Basque country	Travel and guides	26.7		Travel and guides	33.3		Travel and guides	45.5	
Pais Vasco	Education	20.8		Education	20.8		Travel and guides	16.7	
Bilbao	Travel and guides	35.8		Travel and guides	31.4		Travel and guides	48.0	
Vitoria	Music	20.3		Travel and guides	20.4		Travel and guides	44.4	
Gasteiz	Travel and guides	33.3		Travel and guides	30.6		Travel and guides	60.0	
Donostia	Travel and guides	46.2		Travel and guides	42.0		Travel and guides	60.0	
San Sebastian	Travel and guides	38.4		Travel and guides	37.9		Travel and guides	77.0	
	Popularity			Free popularity			Paid popularity		
	Category	Percentage		Category	Percentage		Category	Percentage	
Euskadi	Travel and guides	21.8		Travel and guides	21.8		Weather	28.6	
Basque country	Travel and guides	44.0		Travel and guides	38.7		Travel and guides	45.5	
Pais Vasco	Education	20.8		Education	20.8		Travel and guides	16.7	
Bilbao	Travel and guides	26.1		Travel and guides	26.1		Travel and guides	39.7	
Vitoria	Sport	20.8		Travel and guides	21.8		Travel and guides	44.4	
Gasteiz	Travel and guides	34.8		Travel and guides	26.7		Travel and guides	60.0	
Donostia	Travel and guides	45.9		Travel and guides	42.0		Travel and guides	60.0	
San Sebastian	Travel and guides	40.5		Travel and guides	37.0		Travel and guides	77.0	



destinations, tourism apps are among the most popular and relevant ones. Among the various categories available at Google Play to classify mobile apps, this work has selected the following ones as the most directly related to tourism: *travel and guides*, *weather* and *transportation*. These categories, as can be seen in Table 1, have been identified as the most common ones in most of the performed searches, since only seven out of 48 belong to another category. In fact, the *travel and guides* category is the most common one in 39 (out of 48) queries and the *weather* one in another two. It is worth mentioning that, except for the searches that return paid apps results, the queries with the term *Pais Vasco* do not provide results within the abovementioned three categories as the predominant ones. Notably, they are catalogued under the *education* category, which does not even appear as a significant category when dealing with other terms for the destinations. This can be result of the inclusion of the term *Pais Vasco* in the description of education-related apps dealing with contents of Spain and its regions. Consequently, it can be easier to become a popular and relevant app if the terms *Euskadi* or *Basque Country* are included in tourism related ones, than merely using the Spanish term.

Attending to the frequencies of the categories placed on the first place in Google Play, there is a remarkable variation. The highest percentage of presence for a category is the one of the apps related to *travel and guides* in the searched for paid apps linked to the term *San Sebastian*. In fact, more than three fourths of the obtained results are applications classified within this group. On the other hand, the lowest percentage of the preeminent category is also scored by the apps classified as *travel and guides*, but when answering to the searched of paid apps of the term *Pais Vasco*. Actually, in this case, only one out of seven applications is classified within this category. Taken all the queries globally, among the ones with significant number of apps,<sup>6</sup> most of them present percentages higher than a fourth but lower than half of the sample for the most common category. Consequently, it can be stated that, apart for the *San Sebastian paid* queries and those others with very few apps, there is not any category for classification of the apps in which more than half of the sample is represented in each query.

As mentioned before, the research has selected the categories *travel and guides*, *transportation* and *weather* as the tourism related ones. Subsequently, an analysis of these categories of apps has been performed regarding their position in the top ranking within each query. That is, the following analysis will state if the tourism related categories are within the three most popular ones of the top ranking related to the queries performed by the crawler. First, as mentioned previously, the *travel and guides* category is the predominant one in most of the queries. Only in nine queries this category is not the top one, but even in nearly all the other ones is present in the top three except for the queries *Pais Vasco relevance* and *Pais Vasco free relevance*, as can be seen in Table 2. Moreover, from the seven queries in which this category is not the top one, only in two of them it does not score a percentage that places it in the

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<sup>6</sup> There are only five applications in the paid queries of the terms *Gasteiz* and *Donostia* and seven in the paid queries of the term *Euskadi*.

**Table 2** Travel and guides apps in top three of each query and percentage of presence

	Relevance		Free relevance		Paid relevance	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi	2	16.7	1	20.8	2	14.3
Basque country	1	26.7	1	33.3	1	45.5
Pais Vasco					1	16.7
Bilbao	1	35.8	1	31.4	1	48.0
Vitoria	2	20.2	1	20.4	1	44.4
Gasteiz	1	33.3	1	30.6	1	60.0
Donostia	1	46.2	1	42.0	1	60.0
San Sebastian	1	38.4	1	37.9	1	77.0

	Popularity		Free popularity		Paid popularity	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi	1	21.8	1	21.8	2	14.3
Basque Country	1	44.0	1	38.7	1	45.5
Pais Vasco	3	13.4	3	13.4	1	16.7
Bilbao	1	26.1	1	26.1	1	39.7
Vitoria	2	19.1	1	21.8	1	44.4
Gasteiz	1	34.8	1	26.7	1	60.0
Donostia	1	45.9	1	42.0	1	60.0
San Sebastian	1	40.5	1	37.9	1	77.0

second place. More precisely, the *travel and guides* apps score the second highest percentage in five queries and the third one in other two. Besides, in all these categories, the percentage of presence is higher than ten per cent. Therefore, at least one out of ten apps for all these categories has been classified as a *travel and guides* one.

Looking at the results of the apps described as *transportation*, it can be seen that in no query they score the highest percentage of presence. Anyway, as shown in Table 3, their presence in the top three of categories takes place in more than half of the performed queries. In fact, only twenty of the performed queries do not present a percentage for transportation apps that place them in the top three of all the categories. Among these queries, sixteen searches have percentages that become *transportation* the second most popular category, whilst it is the third most popular one in twelve categories. Attending to the destination to which the queries refer, two very different patterns should be remarked. In effect, the queries by the term *Euskadi* have identified that in none of the cases this group of applications is present in the top three of the categories, while in all the queries related to the term *Donostia* the *transportation* category is placed on the second place. Actually, a percentage of one fifth or above has been identified in the latter. The category *transportation* is also present in the top of all the queries of the term *San Sebastian* and in nearly all of the terms *Bilbao* and *Gasteiz*. Thus, transportation apps seem to be closely linked to specific destinations rather than to broader ones.

Finally, analysing the apps in the *weather* category, this category appears in the top three only in four cases, as identified in Table 4.

**Table 3** Transportation apps in top three of each query and percentage of presence

	Relevance		Free relevance		Paid relevance	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi						
Basque country						
Pais Vasco	3	12.9	3	12.9		
Bilbao	3	13.0	3	13.0	2	12.5
Vitoria					3	11.1
Gasteiz	2	12.5	3	12.5	2	20.0
Donostia	2	22.0	2	22.4	2	20.0
San Sebastian	2	21.0	2	20.8	3	4.2

	Popularity		Free popularity		Paid popularity	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi						
Basque country	3	4.2				
Pais Vasco						
Bilbao	2	22.0	2	26.1		
Vitoria			3	14.7	3	11.1
Gasteiz	2	16.3			2	20.0
Donostia	2	22.0	2	22.4	2	20.0
San Sebastian	2	20.8	3	20.8	3	4.2

**Table 4** Weather apps in top three of each query and percentage of presence

	Paid relevance		Paid popularity	
	Position	Percentage	Position	Percentage
Euskadi	1	28.6	1	28.6
Pais Vasco	2	16.7	2	16.7

Due to the low number of categories with any data for this query, only those ones with information will be reflected in this table

In all these cases, this phenomenon can be observed linked to paid apps. It should be highlighted that in two of these cases, namely the searches performed using the queries *Euskadi paid relevance* and *Euskadi paid popularity*, the weather apps are the top ones, with a percentage above one fifth of the identified sample. In the cases of *Pais Vasco paid relevance* and *Pais Vasco paid popularity*, this category scores the second highest percentages. Contrarily to what has been identified related to the *transportation* category, the *weather* category seems to be more linked to broader destinations than to more specific ones. Furthermore, this category is present in the top three of only *paid* apps searches. Consequently, it can be stated that, while the category *travel and guides* is popular in most of the performed searches, *weather* category is linked to more specific queries.

## 5 Conclusions and Further Research Lines

This work represents the first step in a broader research line that revolves around the development and use of mobile tourism apps. Some conclusions have arisen from this research. While queries related to broader destinations present a higher volume of downloads and even of applications, apps related to more specific destinations have a more limited reach in terms of download number and popularity. Similarly, apps linked to vernacular languages seem to be less popular than those ones in English. Therefore, for a broader reach of the apps, names of places should at least be included in English or in a widespread form in the description.

One of the difficulties identified in this work has been the existence of homonymous names for some of the selected destinations. For example, there are other San Sebastian named places in Madrid and the Canary Islands and some of the identified apps, even though they represent a small portion of the sample, are related to these places. Similarly, there is a larger Vitoria in Brazil and it also represents the name of a football team in Portugal. Consequently, in these cases, there is a need to specify which of the cities or entities the term refers to. So, in order to fully automate the search process, it could be convenient to create a semantic disambiguation engine for these terms.

Among the different app classification categories available in Google Play, the travel and guide category is the most popular one in the queries that have been performed. Thus, tourism related apps are popular within the selected searches. However, there are noticeable differences between the diverse categories related to tourism. For example, while *travel and guides* apps are common, *weather* related apps are scarcer. This makes it difficult to agree on a standard categorisation of tourism apps, since not only has the researchers' criteria to be taken into consideration, but also the categories available in a general market as Google Play or others. Matching these two interests seems something complex. In light of these facts, this paper suggests that, at least for the selected destinations, there are some clues about a possible strategy to name and classify an application. Firstly, to name and describe the application vernacular languages represent a limited market and, if nomenclatures in these languages are going to be used, it would be advisable to accompany them by their Spanish or English equivalents. Similarly, if there is any homonymous name, it would be helpful to provide the name of broader geographical entities in relation to the local one in order to univocally identify the destination.

Looking at the classification to be selected when uploading the tourism-related application to Google Play, the paper has also found some interesting results. Apart from the more generalized *travel and guides* category, another two have been related to tourism, namely *transportation* and *weather*. These categories, however, score higher in some specific geographic scales in the performed analysis. For instance, the *transportation* category scores better results if it is associated to local destination than to a broader one. The *weather* category, conversely, shows the opposite trend, since it does not score good results for local destinations.

Therefore, from the results of this paper, *transportation* apps should be linked to local destinations whereas *weather* apps to wider ones. Finally, if the aim is also to receive positive valuations by the users, free apps seem to fulfil more their expectations than the paid ones. Thus, the added value provided by a paid app has to be significantly much higher than the one provided by a free app in order to have really high valuations.

Summing up, the aim of this research has been to identify in a quantitative manner the generic data of description of mobile apps and their categories in relation to specific territories. In this sense, the analysis has highlighted some findings, but, as mentioned before on the paper, there is a need to also specify the stage of the travel process to which each mobile application is linked. Nevertheless, there is no standard categorisation that defines features or characteristics of the applications used in each stage. This would help to categorise the apps into a standard classification, depending on the stage of the travel process in which they are designed to be used. Thus, one of the further steps to be taken is the generation of a standard categorisation to allow developers to create mobile apps that meet the specific requirements of users in the selected phase of the travel.

Similarly, this contribution has focused on generic features of the groups of apps that fulfil the requirements of some queries. Anyhow, in order to be able to identify more precisely the most relevant applications available on the tourism market nowadays, it would be necessary to perform the analysis focusing on individual apps and not in groups of them. This new approach would facilitate the identification of the search terms in which each application appears. Therefore, this new approach would also identify the most common terms of search for relevant applications.

In order to be able to generalize the obtained results, the analysed sample should be broadened and embrace more global searches. In this sense, another further step to be taken is the inclusion of other destinations in the queries so that reached conclusions can be contrasted and verified with the ones obtained for other destinations. Equally, in order to count on a more universal sample, it would be sensible to extend the analysis to other app markets. Thus, it would be interesting to extend the study analysing the apps available in other markets, such as Apple Store, Blackberry World or Windows Phone Store, among others. Finally, and taking into account that information can be accessed through different mobile devices apart from smartphones, another interesting step to be taken would be the possibility of identifying and analysing the consumption and usage patterns of apps depending on the device in which they are executed.

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