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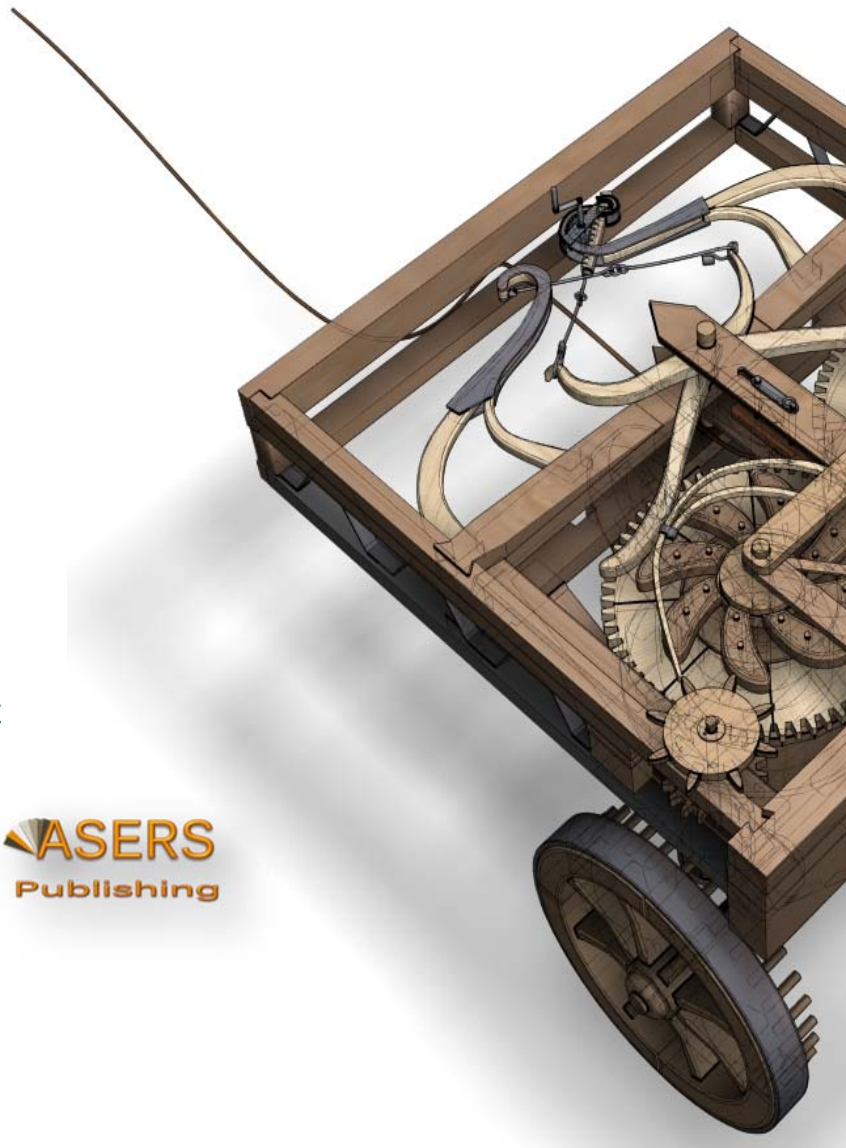

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Smart Travelling or the Impact of IT in Tourism

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Abstract

In this modern and blooming age of technology, tourism along with many other aspects of life are highly impacted by IT industry, especially the social media aspect, where everything is judged and interpreted. It is way simpler nowadays to find reviews online, with pictures included, about everything tourism-related such as places, museums, hotels, restaurants, even the locals.

The impact of online information and personal opinions of people about destinations can be very influencing for different types of possible tourists in choosing their vacation or week-end getaway especially now in the growing age of social media, where users share every aspect of their lives, travelling included.

We take a look at the various ramifications that computer science has over tourism in general and how it can be of use to the traveler of the 21st century via its many ways of digital interconnection.

Keywords: smart travelling; information technology; tourism; recommender system; social media.

JEL Classification: Z31; O14; D19.

Introduction

Technology has become one of the most important way of living, it makes our lives easier and of course it helps us stay informed in a much accessible manner. Of course everybody uses the Internet easily nowadays and with the age of smartphones it is increasingly simpler to access, but the implications of IT in tourism go way beyond that, from apps on smartphones that help us book a vacation, read the reviews and recommendations for a hotel or a restaurant, to software that can help us book a flight, complete the online check-in for the flight or pay for the services (Werthner and Klein, 1999). There is more and more information available, which leads to increasing and decreasing transparency at the same time. On the one hand, all this information is available and can be accessed, but on the other hand, the amount of available information could lead to information overload, and it might be difficult for the users to find what they are actually looking for. Search tools and recommending systems are available and can help to address this problem, but users typically do not know how these systems exactly

work and what data they exploit. All of this could point to a feeling of insecurity and associated trust issues. (Neidhardt and Werthner, 2018).

It is important to understand how technology and ultimately being able to stay connected online, has changed the distribution of information and the way people experience their travel (Neuhofer et al. 2014).

Staying connected has become such an imperative technological development that inventive projects like Facebook's solar powered drone or Google's balloon powered technology are being developed to provide connectivity even in the most remote areas in the world.

The continuous growth of the information and communication technologies impact on travelers during their journeys has been focusing on how media, software and devices can improve communication, gather information and improve experiences (Wang and Fesenmaier, 2013; Lamsfus et al. 2015).

This study tries to explore the various sides of this massive interconnection and analyze the positive and negative outcomes of travelling smart.

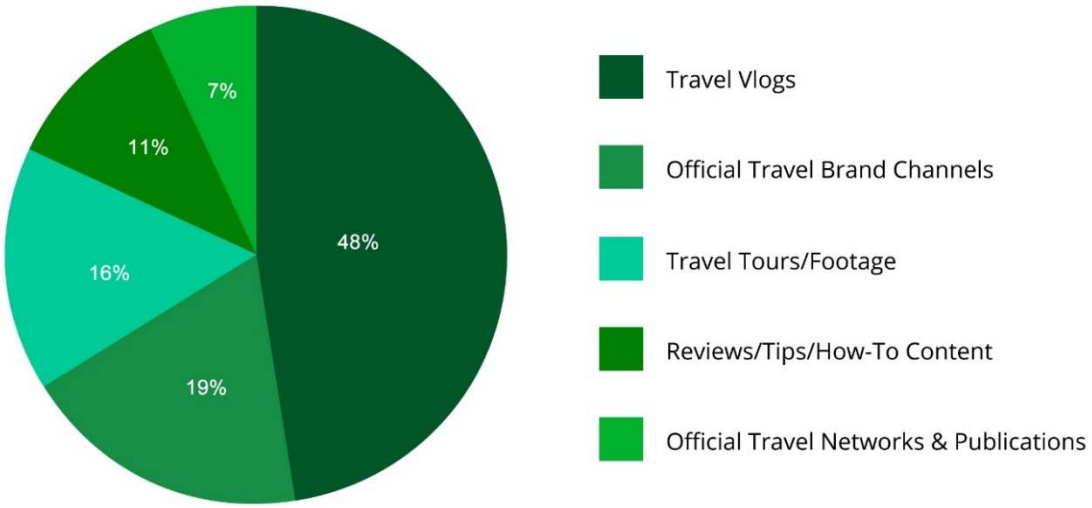
1. Travelling for a Living

Imagine when a traveler is going to embark on a journey, while he goes to the airport, he listens to music online, uses the social media, and completes the online check-in for the flight. He boards the flight with a ticket retrieved on his smartwatch, arrives at the destination, and finds a ride with an app on his phone to get the hotel. After checking-in at the hotel, our traveler selects a restaurant through advisor websites, and then navigates to it using online maps and GPS. Once the food arrives, he captures a photo and uploads it on his social media account, shares his location and writes a short insight about his experience, chats withs his friends online and reviews the restaurant. He could also find quickly a list of attractions that he might want to visit in the area. He could also share a live video of what he sees and even blog about it. Existing technology facilitates all these activities in an efficient way and is very accessible to mostly everyone. Although this is, by no means, how all travelers use technology, it shows some of possibilities that users can easily have access to while being connected (Tanti and Buhalis, 2017).

On the other hand, there are people who travel for a living, so to say. They are the vloggers and travelling influencers out there, bound to go places and share their experiences with their followers via video blogging, or the digital nomads – the people who work remotely from their laptop and use their freedom from an office to travel the world. This concept has found a lifestyle movement that sells itself via personal blogs, social media, in-person conferences, news features, and e-books (Thompson, 2018).

Travel vlogs are engaging, authentic, and inspiring, they allow people to experience secondhand travelling. That's the main reason vlogs get four times higher engagement on social media (i.e., likes, comments, shares, favorites, and subscriptions) than other travel content types on YouTube, as Figure 1 shows.

Figure 1. Percent of Travel Channel Subscriptions by Format



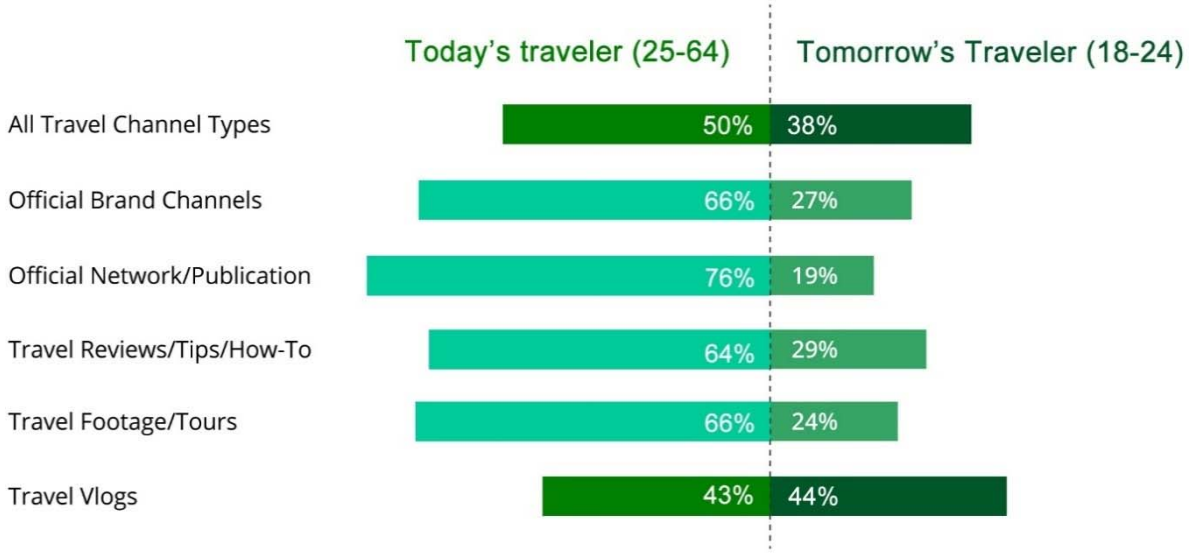
Source: YouTube Data, March 2014, United States, by ThinkWithGoogle

Personal as their experiences are, the travelling vloggers have a great influence on the large public on whether or not to go to a destination or the other, choose this or that hotel, go visit a local attraction, etc., although the tendency seems to be for the younger audience to favor travel vlogs and be influenced by this type

of recommendations, most likely because they are more interested in the authenticity of the content (Gellerstedt and Arvemo 2019).

In Figure 2 we can observe that the 25-to-64-year-olds seem to be interested in a broader range of content relevant to frequent travelers. Often these are videos associated with further decisions down the travel purchase path, such as brand information, reviews and tips (thinkwithgoogle.com, 2014).

Figure 2. Travel Channel Subscribers by Age Group



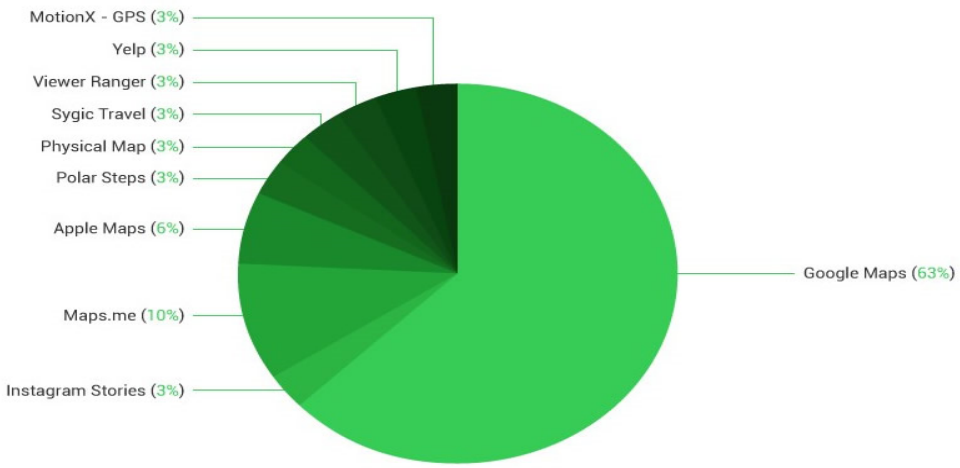
Source: YouTube Data, March 2014, United States.

2. There's an App for that

Since our society is a big consumer of daily technologies such as: mobile devices, mobile applications, gadgets, etc., it's only natural to put them on good use when it comes to travelling. Also, the ease of use when considering these devices derives from the fact that they are easy to carry on you while travelling or even taking a walk, therefore the mobility is a plus in this case.

The most important of the mobile apps when it comes to traveling are the maps and navigation systems, because you have to know where you are and how to get where you're going. The GPS uses smartphone networks in combination with a GPS antenna to increase the speed of determining the current position, and then the app you use with the GPS could find the best route to destination, suggest attractions in the area, restaurants or hotels. Consequently, various smaller apps have been created for specific locations, let's call them local apps. These are also based on GPS location, but can also provide information about local history, sights, museums and places to visit (Zacarias et al. 2015).

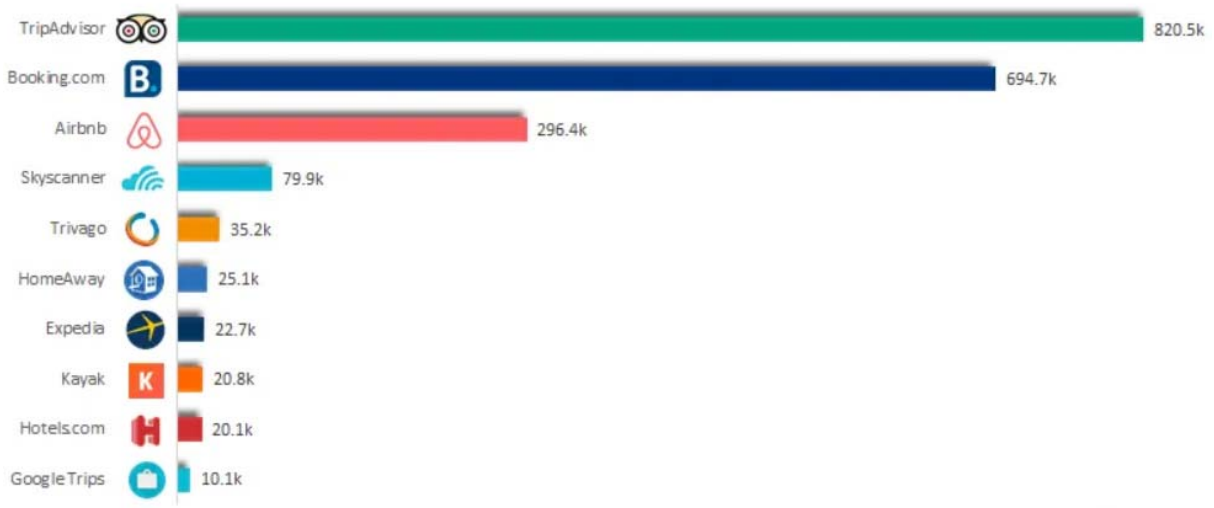
Figure 3. Preferred GPS and Map Apps (10 Apps, mentioned by travel bloggers)



Source: turtler.io, 2018

Google Maps is by far the most popular mapping app for pro travel bloggers/vloggers. Because the Android OS is very common for smartphone users, and the general ubiquity of Google, all of the data present in Google Maps, and the ease of access, it is a first choice for many travelers.

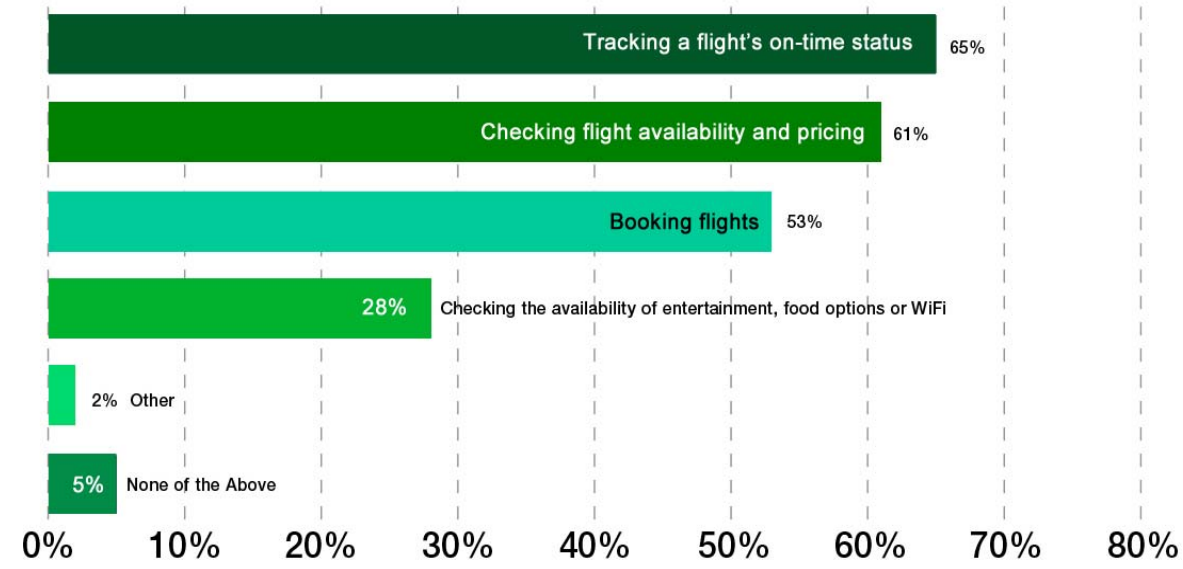
Figure 4. Top 10 Most Popular Travel Booking Apps, EU, Average of Unique Daily Active Users of the 5 Most Populated EU Countries, August 2018 (for Android)



Source: SimilarWeb by geckoroutes

Next, we have the travel booking apps that not only help you find a hotel, but they also contain reviews and recommendations with pictures from other users. During the trip planning process, tourists search information so that they can form an idea, seek for alternatives, and stay away from places that do not interest them. Using these apps, they can read reviews and other traveler's opinions, which helps them form a clear picture of what to expect, increase their confidence in making a decision for the trip and reduce the risk of being disappointed. Figure 4 shows the most popular travel booking apps in EU with average number of unique active users, considering the most populated 5 countries in EU.

Figure 5. How Travelers Use Airline Apps



Source: Travel Weekly

After the vacation is planned and booked, there is the issue of transportation means. There are apps like Uber, available worldwide that provides local transportation, and also the local taxi companies started to join the smartphone apps community so that they can keep up to technology speed. You have the option of car rentals, or if you have to book a flight, there are various online options, but the airlines have adapted to public requirements

and created mobile apps too. As a 2016 Travel Weekly Consumer Trends study shows, people download airline apps for services that make their journey less stressful (Figure 5).

As we mentioned before, the social media apps are also a big deal when comes to travelling and vacations, because a memorable travel experience increases the variety of content that tourists are willing to post on social media, and of course the reaction of other users to the uploaded content can shape the travel experience of the uploader. If they gain support, encouragement and positive reactions on social media during their trip, travelers have a more enjoyable and meaningful experience. The main activities the tourists share on social media related to their travels are shown in Table 1. As we can see people are likely to share their photos and vacation-related content during their vacation, as well as after they return at home.

Table 1. Top travel-related activities on social media

Travel-related activity	Total sample	Used a travel agent
Put up photos, posts or tweets during vacation	37%	29%
Put up photos, posts or tweets about my vacation when returning home	36%	37%
Get opinions about travel experiences	31%	42%
Follow, like, pin or interact with travel companies, organizations or their executives	23%	32%
Follow, like, pin or interact with non-travel companies, organizations	22%	42%
Engage with travel sellers about travel opportunities	15%	37%
None of the above	29%	14%

Source: Travel Weekly

3. The Data is Talking

Travel and tourism are fast becoming the largest category of products sold on the Internet, this category being also called e-tourism. Travelers need both static and dynamic information, which includes detailed information about location, climate, local attractions, history, facilities, etc., information about airlines, trains and buses schedules, cost of transportation and accommodations that can change regularly (Jadhav and Mundhe 2011). All this data needs to be collected, stored, processed and published on a real time basis.

Artificial Intelligence is being applied to the tourism sector through Deep Learning, that is a part of AI, a branch of Machine Learning. It studies how to imitate the logical processes that the human brain operates while learning, so that computers can reproduce them artificially. The way this method relates to learning is the fact that it grants a system the means to discover by itself how to organize raw data.

Tourism Like any other industry, depends on technology for its daily operations, where there is a constant need for fresh and ingenious technology to improve business processes and increase profit. A computer can accurately find the correlation between the factors that cause the seasonal demand by analyzing raw data from the past and predicting the future trend (Cankurt and Subasi 2015). It can analyze the similarities between past experiences and preferences in order to form groups of people who think alike and therefore compile recommendations or predictions for a certain individual user, typically without the need for an explicit search query. This process, called Predictive Analytics on Time Series, uses the patterns of the past to predict future events (Nilashi *et al.* 1027). That is how recommendation systems are used in order to provide quality output for users, with minimal effort on their part, but also increase the profit and improve tourism industry overall. Recommender systems are developed to actively recommend the right items to online users and have been useful mostly in e-commerce, thus in e-tourism as well.

Tourism providers use competitive prices, and this is one of their most important strategies to attract customers. They try to adjust prices in a way that doesn't compromise their profits and allows them to attract the maximum number of customers. This is where Deep Learning comes in handy. For a decade, important travel websites have used Deep Learning through recommendation engines to offer users the holiday packages that best fit their consumer profile. The engines collect budget-specific data, preferences and customers details to provide personalized travel recommendations (Nemade *et al.* 2017). Data acquired via different sources and

service suppliers is used to find best alternatives using a Deep Learning program. The classification becomes more diverse into smaller groups, and even subgroups that have never been seen before, therefore the quality of service improves as it becomes much more custom fit for individual clients. Bottom-line is that all IT-based technologies use every available human input in order to provide us with relevant and better content on everyone's benefit.

Although there are so many variables when it comes to recommendation systems, we attempted a classification of existing techniques, considering the data typeset used, as shown in Table 2.

Table 2. Comparison of different techniques used for recommender systems

Techniques	Advantages	Disadvantages
Collaborative filtering	Recommendations based on user ratings, diverse	Less efficient, tends to ignore newer items, scalability
Content-based filtering	Recommends items relevant to the topic, new items included, transparent	No user feedback, impersonal
Hybrid approach	Efficient and more accurate, improves performance	Difficult to reach, combining techniques
Graph-based approach	Finds similarities in users and products	Graph modelling
Knowledge-based approaches	Doesn't rely on prior purchases and ratings	Requires more details about items, static suggestions
Demographic	Improves with time	Diminished accuracy and issues with new users

Source: Shokeen and Rana, 2019.

Using community-contributed data, such as blogs, social networks, GPS logs, and media tagged with location, recommender systems are built to help the users by generating personalized recommendations (Xiang *et al.* 2017). From the implementations point-of-view, the recommender systems implemented so far have background algorithms based on AI techniques such as: Multiagent systems, Optimization techniques, Automatic clustering, Management of uncertainty, Knowledge representation (Ravi and Vairavasundaram 2016).

The immense expansion of social networks has generated opportunities for researchers to analyze social media input and use it in recommender systems. Thus, in order to improve tourism recommender systems quality, non-classical approaches appear, such as Personalized Approaches, Context-aware approaches and Ontology Based Approach (Kzaz *et al.* 2018).

Some of the features considered when building a social media-based recommender system are: context, trust, tag, group, cross social media data, temporal dynamics, heterogeneous social connections, semantic filtering (Shokeen and Rana 2019).

Still the challenge remains in selecting the relevant data from all the collected input, user profile construction and update, that aims to avoid information overload and offer only relevant information to the tourist. The challenge remains for computer scientists and researchers to improve and keep innovating the recommender systems field in order to increase quality of suggestions for customers as well as the profit and prosperity of tourism industry in general.

Conclusion

IT and especially Internet changed everything; it has transformed the world into a global center that can be navigated at the click of a mouse. It provides potential tourists with immediate access to textual and visual information on destinations all over the world. It also breaks the boundaries between cultures, currencies, social customs, accessibility, location, making it easier for people to get around and comprehend people and places. It makes things easier for the tourism industry, managers and service providers to take things further and meet clients (*i.e.* tourists) needs.

In this paper we have emphasized two trends that imply the use of IT in tourism; though still implies the use of technology, the first one is based more on the social and human side, from people's point of view. The special features of the tourism product include the fact that it's an experience-based good, therefore information-based, and it's a product defined by the tourist, so almost every product can become a tourism product, when it is consumed by the tourist.

Whereas tourism is an emotional and personality-based product that is associated with fun and recreation, the second trend involves prediction and learning, it is more machine-based, thus non-emotional components, fact that makes it challenging for interfaces as well as for decision-making and recommender systems.

Social networks are distinctive platforms that serve a double purpose. Firstly, social networks generate recommendations using the affluent accessible information, and secondly, they provide users with these custom-fit recommendations.

Somehow, we can conclude that Social networks are the key to better combining the two trends, the social human part and the computer science side to improve the quality of e-tourism and therefore of real-life tourism and people's traveling experiences.

IT is everywhere at any time, thus when looking at tourism industry, it is obvious that IT has changed almost everything, but this change has to go on in order to continue the journey and supply its design and construction.

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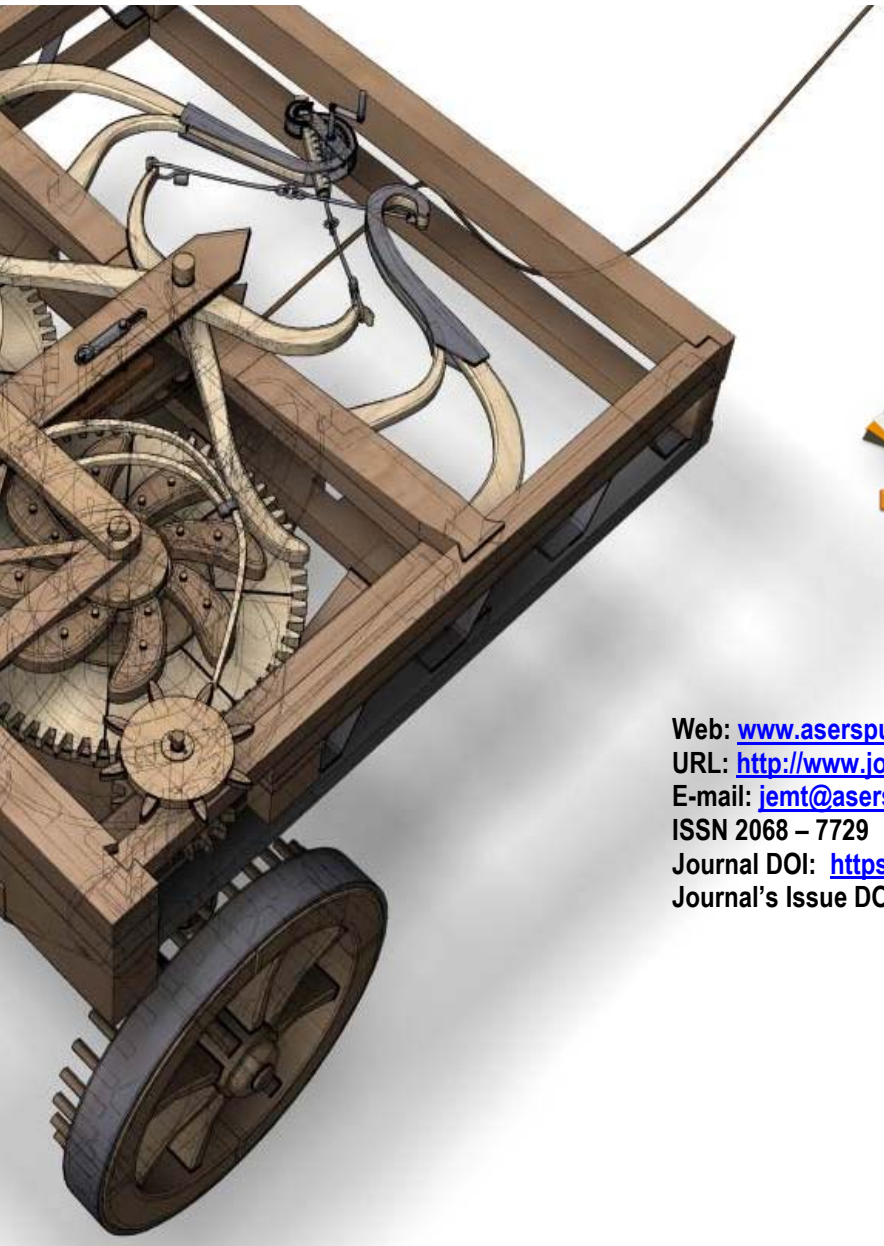

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