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# Colombian Tourism: Proposal App to Foster Smart Tourism in the Country

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The growth of Internet, Social Network Services (SNS) and the utilization of Information Technology (IT) is spreading in tourism industry. Since information has high value in this area, Colombian population and tourism are increasing, thus it is required to improve the resources' administration, this involves transforming conventional cities into smart cities with the implementation of information and communication technologies (ICT) and the use of IoT which allows the interconnection of things with the internet. The smart tourism is explained as a holistic approach that provide tour information, service related to travel, such as destination, food, transportation, hotel reservation, travel guide, conveniently to tourists through IT devices. In our research, we focus on the Colombian Tourism and from a literature review about the topic, proposing a tourism content for app development we propose a way for promoting it, taking different tools from some smart cities that allow to advance in the sector.

**Keywords:** Internet of Things (IoT), Information Technologies (IT), Smart Tourism.

## 1. INTRODUCTION

Colombia is one of the most beautiful but unknown countries in the world, nonetheless this country also has bad reputation as “dangerous place” because of the internal problems that the country had in the past. The drug Traffic and the guerillas had been problem in Colombia since more than 50 years ago, but in the last decade a lot of things have changed, there is more security, people can drive safety on the highways from city to city without any danger, touristic places are safer and of course, the cities as well. But sadly, only locals and people that are in direct contact with the country know that.

The arrivals of international tourists in Colombia were approximately 1.4 million per year in the mid-1980s and, although they later recovered at rates above 10 percent per annum since 2002, reaching 1.9 million Visitors in 2006.

On the other hand this sector of the economy has been considered as an industry of few growth this by factors like the internal conflict, nevertheless in 2006 the country obtained earnings of US 2,000 million by part of the international tourism. [1]. Visitor arrivals by international tourism grew by 4.4% in 2015 Reaching 1,184 million visitors, contributing an increase of 3.6%, in the earnings from the international tourism industry in

2015 Reaching US \$ 1,232 billion [2].

The calendar of tourism in Colombia goes around some special dates and different places of the country like Cali's Fair, the Barranquilla's Carnival, the Bogota Summer Festival, the Ibero-American Theater Festival (in Bogota) and the Flower Festival in Medellin.

Many people also visit Colombia during Christmas time and for the celebrations surrounding the Independence of Colombia. The Ministry of Tourism considers high seasons the Holy week, summer (June, July, August, September) and Christmas season. It is not exact register about arrivals on those dates to our country but there can be said from Fig. 1 that there is a market niche in tourism industry from the average growth shown for South America from 1990-2010, 2014 and 2015.

The development of Colombian Tourism and the variety of geography in the country, the flora and fauna across Colombia has also resulted in the development of an ecotourism industry, which is concentrated in the country's national parks. Colombia is home to seven UNESCO World Heritage Sites [3]

In 2015, just over half of all visitors traveled by air (54%), while the rest traveled by land (46%), by road (39%), rail (2%), Or water 5%). In this way the air transport has been increasing gradually and faster than the land transport [4].

	International tourist arrivals (million)		
	1990 - 2010	2014	2015*
World	679	1134	1186
Advanced economics	409,6	622	653
Emerging economics	269,4	512	533
By UNWTO regions:			
Europe	379,08	580,2	607,7
Northern Europe	46,52	70,8	75,9
Western Europe	131,32	174,4	180
Central/Eastern Europe	71,12	120,2	126,6
Southern/Medit. Europe	130,12	214,8	225,2
of which EU-28	316,16	454,1	478,4
Asia and the pacific	121,58	264,4	279,2
North - East Asia	64,68	136,3	142,1
South - East Asia	41,1	97,3	104,6
Oceania	9,04	13,3	14,2
South Asia	6,76	17,5	18,3
Americas	122,64	181,9	192,6
North America	86,64	120,9	127,6
Caribbean	16,16	22,3	23,9
Central America	4,6	9,6	10,3
South America	15,24	29,1	30,8
Africa	14,8	55,3	53,4
North Africa	8,4	20,4	18
Subsaharan Africa	6,4	34,9	35,4
Middle East	9,6	52,4	53,3

Fig 1. International tourist arrivals – UNTWO [4]

## 2. METHODOLOGY

According with the objective of this research, authors have analyzed the findings about the deployment of tourism into smart tourism in some places around the world, to give a proposal of tourism applications to promote Colombian tourism for national and foreign people, keeping on mind the needs that presents the country and the statements established in some other applications developed. First of all, the paper makes an introduction about the development of tourism in Colombia, then a conceptual approach is done to bring over the reader to the implementation of Information Technologies, Internet of Things and other tools. In section IV the most important characteristics from some tourism' applications are named in order to develop a proposal for Colombia tourism.

After that, the proposal of the app is explained, pros and cons are given, linking the information shown in the present text in order to show an approach that boost the Colombian tourism and the economic growth of the country, then final conclusions are given.

## 3. CONCEPTUAL APPROACH

### 3.1. Smart City

A smart city can be set as the city that makes a better use of public resources [5], that deploy the Information and Communication Technologies (ICT) in private and public services more aware, interactive and efficient [6],

increasing the quality of life for citizens and reducing the cost of the public administration [7]. An smart city is that where the IT is developed with the physical environment of its inhabitants, with the help of IoT applications that incorporate society with its physical space [8].

It is also the place where the classic services have been transformed into more efficient services with the promotion of Information Technologies achieving a greater productivity in the activities of the city. [9]. Another concept about smart city is offered by IBM, which defines it as the ability to respond intelligently to the needs and requirements that are presented using ICT, identifying, analyzing and integrating the important information of the main systems of the city. [10].

The smart city is the one that develops applications in an integral way to increase the evolution of the place in all the aspects that public and private management can appreciate. Some of the most common apps that are deploy in a smart city are smart transportation, smart tourism, smart energy, smart health, ambient-assisted living, crime prevention and community safety, governance, disaster management and emergency, smart homes and environmental management, among others [11].

### 3.2. Information and Communication Technology

ICT is the application of non-physical (Internet) and physical (computers or some other devices) resources to capture, store, classify, retrieve and manipulate data which have as first source and last receiver to the user. Cloud computing as the mechanism of high speed network and data processing that moves information from a private server to a remote computer cluster [12], big data as the set of non- structured complex data [13], data mining as a way to classify and get valuable data, e-commerce and e-government as the development of services applications on line, among others are some of the Information and Communication Technologies that cities use to implement in their apps to become into Smart Cities.

### 3.3. IoT general framework

IoT is the concept that was born when the device to device communication became a reality [14] and coined by Kevin Ashton in 1999 [15]. It makes reference to the identifiable physical objects connected to internet [16] that works as a self-organizing system that pretends to improve the efficiency of information flow [17].

The Internet of Things as the tool that allow to get almost everything connected, following the next objectives [13]:

Convergence: To process any kind of information, with any device.

Communication: Staying connected in any place and in any moment.

Connectivity: Connected from any network, any path.

Content: Without discrimination of content.

Computing: With direct access in any time.

Collections: Of services for any kind of business.

#### 4. SMART TOURISM APPROACH

Tourism is a social, cultural and economic phenomenon which entails the movement of people to places, cities or countries outside of their usual environment for personal or business/professional purposes [17]. The tourism is an area that grasp a huge range of information, that requires of an efficient management whereby there is high dependence on information and communication technologies (ICTs), reason why the concept of “Smart” has been incorporated to phenomena that encompass tourism sector in the last years.

In many ways, Smart Tourism can be seen as a logical progression of traditional tourism, and more recently of e-tourism in which as the innovation and technology groundwork as costumers were laid early with the extensive adoption of information and communication technologies (ICT) in tourism tools and resources. For instance, in the form of global distribution and central reservation systems, the integration of Web-based technologies that led to the emergence of e-Tourism [18].

Smart tourism has as main objective to promote the increase of tourists from the use of Information Technology (IT), making use of some important concepts from the implementation of ICT in the smart cities and using the IoT to interconnect physical things with the internet, smart tourism pretends to provide innovative technological resources to tourists, enhancing their experience in a touristic place [18].

Nowadays, it seems like implementing smart tools for tourism destinations has become a trend, even if the answer from user is positive or negative before the use of this kind of applications. However, in this context it is argued that applications developed around destinations provide several benefits such as enhanced user-friendliness and a higher probability of finding strategic places in a specific destination, and the possibility of getting a better touristic experience in each trip.

#### 5. SMART TOURISM APPLICATION KEYS

According with the available data, there was identified three tourism applications developed for Android, which show the current need of developing an app that really achieve to incorporate smart tourism in Colombia, according with the presented by Google statistics. First one is “Colombia travel”, as shown in Fig. 2 this application has got around 10 thousand of downloads and just 231 evaluations, being most of those pretty regular what gives it an average of 3.1 and having as critic the slow running speed, the huge magnitude of theory content and the non-interactivity with the user. Second one is “Turismo Colombia” as denoted in Fig. 3 got the same number of downloads but a little better qualification from users, (keeping in mind that it has got just 117 evaluations with good commentaries about the information presented to travelers buy registering too some problems on connectivity with some devices. The

third one and last one, “Colombia Travel Gide” (Fig. 4) application that got the half of downloads comparing with the two others, that has got few evaluations (47 people) but that registered better qualifications. There are not specific commentaries about this app reason why there is a lack of information about the need of requirements that people demand from it.

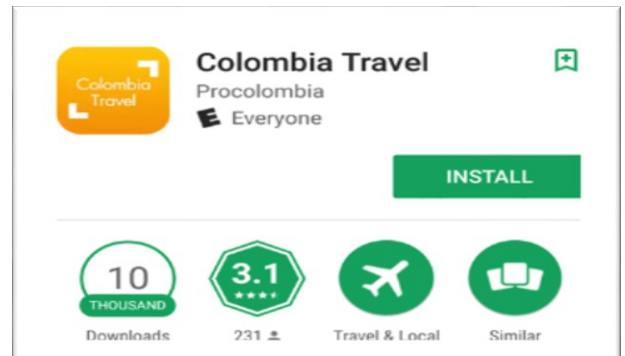


Fig 2. Colombia Travel – Google play Statistics

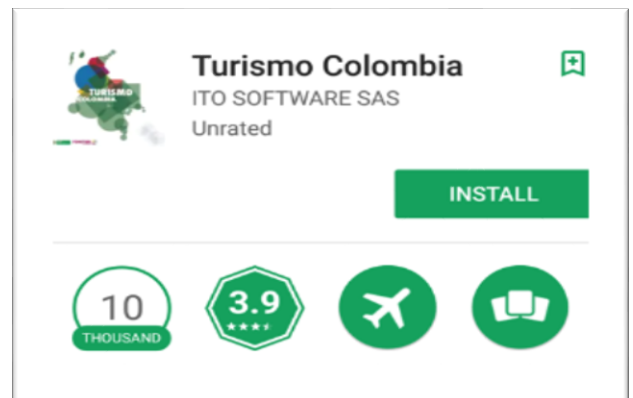


Fig 3. Turismo Colombia - Google play Statistics



Fig 4. Colombia Travel Guide – Google play Statistics

Taking into account relevant information about some national and international applications of tourism sector and the current need of Colombia as a developing country which is looking for the general implementation of ICT and the growth of national tourism. Research finding are analyzed and shown in this section the favorable qualities for a tourism application that can respond to Colombian needs in this area.

##### 5.1. Selection of destination

The application should contemplate a great variety

of options according to the possible destinations inside the country, in order to catch the attention, providing interesting details that inspire tourists to know more about the shown places [18]. This material should contain the appropriate multimedia to motivate the user and transmit the tourism experience.

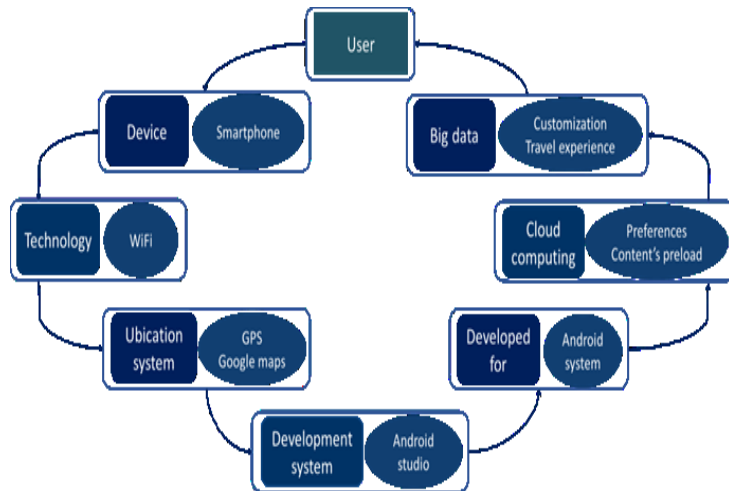


Fig 5. Proposal application for Tourism Application.

### 5.2. Ways to travel

According to the territory and user's preferences there should be shown the ways to get into the touristic places, ways of transportation, rates of prices and quality of services and companies of transportation able in the country. It's important to link the user with the reality of the country, giving to the tourist different terms to decide what is the best option and not pressuring the user to choose a specific service.

### 5.3. Security and general services

It is important to let relevant security information in hands of tourists. For instance, with police, fire brigades, emergencies lines and some other information channels [4] to get help at emergency cases or to get guide in some important situations of travel route.

### 5.4. How to get prepared for the trip

Colombia has a huge variety of nature and ecosystems, so it is important that tourists stay prepared for the weather in the different places of the country. Given the biodiversity of the country some places require for entrance the vaccines card, to prevent some illnesses typical of some insects or other conditions of the regions.

### 5.5. Places to eat

It is well known that gastronomy works in each country according with the culture. There are some dishes that tourist can find in specific places, but there are some others that can be find on the street, that vary in quality and quantity according to the zone or the region, and there are dishes specially in Colombia that have no places to be found because people send walking around cities or some touristic places.

### 5.6. Interactive proposal of virtual tours

On-site discovery and learning can be mediated through interactive media [19], the use of location services and street view can help tourists who have a defined tour, but it can also help to people interested in delineate a route according with likes, preferences, available budget among other variables.

### 5.7. Storytelling

Storytelling is what objects around would say if they could talk [19], keeping in mind the huge quantities of data about history of places and elements, the app should introduce really well to the user to what can find in some touristic places and what does it mean, to give the users the ease to determine which are the best places to go following their preferences.

### 5.8. National parks and museums

The tourist should be invited to know more about history, biodiversity and the experience that each park and museum offers, giving additional information like maps and multimedia that allows to the user to get located in the destination, without the mandatory use of internet services.

## 6. APPLICATION ARCHITECTURE

The proposal application would be developed in order to accomplish the named requirements of the section above; the user is the first source of information and the one who will receive the final result of the new travel experience, for the usage of the application people need of a smartphone or a tablet to interact with it, with availability of Wi-Fi technology service to get the complete experience of assistance in travel service, additional to that the app requires of GPS technology to offer the possibility to the user of utilizing google maps service to get in the touristic places. As development system Android studio is selected to develop the app given that it offers the opportunity to get real time rendering, optimization tips, Android specific refactoring and quick fixes, Lint tools to detect performance issues, usability, version compatibility, and other issues, support for programming apps for Android Wear, among other characteristics.

In first place, the application will be launched for android system on google play list, as means of proof, trying to make it the most lightweight possible (around 25 MB), then according to customers' reception it can be developed for IOS and Windows phone systems. This application pretends to the users the possibility to choose their preferences matching favoritisms in the different proposed options as parts of the app and the choice of preloading the content of places, ways to arrive and some other information. Finally, big data is used to classify carefully the useful information for the users to get them in a new experience to travel through a proper customizing service that allows the continuous improvement.



## 7. CONCLUDING REMARKS

The development of Internet of Things has gone hand in hand with the globalization, the proper use of information technologies has supported in a great way the development of societies, IoT as the use of IT contribute to the creation of Smart Cities in which many areas are contemplate, among that the Smart Tourism, that is implement in order to promote tourism inside and outside of the country, and make grow up the national economy with the development of applications that help citizens to get connected easily and get services of ubication, ways to travel (transportation) and accommodation, among others in short time.

According to the study, authors evaluated and analyzed some developed local and non-local applications from other parts of the world, trying to extract what is considered as relevant for users to get a great travel experience and the needs given from the results of the existing applications in the country such as Colombian culture and geography. The structure of application was given keeping in mind the use of proper technologies and systems that allow to give the best of tourism apps to foreign and local people, taking advantage of it would have only one application as direct competition, so it is expected to have a great acceptance from customers, and feedback process would allow to improve it in all sense.

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