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SMART TOURISM: PERSPECTIVES FOR ITALY

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Alla mia famiglia per aver creduto in me in ogni singolo momento.
Ai miei amici di Ruvo per essermi stati accanto pur essendo a 750 km di distanza.
Ai miei amici di Padova e all' Unipd per avermi fatto allargare i miei orizzonti permettendomi di scoprire meglio me stesso.

Abstract in italiano

Lo scopo del presente elaborato è quello di presentare il fenomeno dello Smart Tourism come naturale opportunità di crescita in Italia. In particolare, se ne individuano i tratti distintivi adducendo due differenti casi italiani di applicazione: TreSight e MyFirenze.

Nel corso del testo infatti, viene fatta dapprima una descrizione del settore del turismo con particolare attenzione all'influenza che esercita in Italia, diretta ed indiretta. In seguito, si analizzano i principali trend in corso negli ultimi anni che sconvolgono sia la domanda che l'offerta.

Nella seconda parte dello scritto, alla luce dei vari cambiamenti descritti, si presentano le tecnologie che permettono l'evoluzione del settore, segnatamente internet of things, cloud computing e big data. Allo stesso tempo, si portano esempi di applicazione di tali tecnologie in altri ambiti diversi dal turismo.

La parte finale, invece, è tutta dedicata alla Smart Experience, perno fondante dello Smart Tourism, la quale viene descritta a partire da delle considerazioni a livello teorico sull'economia dell'esperienza.

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1. Introduction

The linkage between tourism and Italy dates back to the XVII century, when rich young men undertook a tour around Europe for the purpose of learning different cultures and increasing their social prestige. Such tour, called "Grand Tour", made Italy one of the most famous destinations, mostly for its relevant cultural heritage, ranging from the North to the South those people got to experience different cultures, traditions, and lifestyles that were out to reach in their hometowns. Ever since the Grand Tour spread out among young aristocrats, tourism sector turned out to be one of the pillars of the economy as a whole, not only in Italy. In global terms, tourism has become a worldwide leading sector as it has been spurred on by international tourists. An increasing amount of foreign visitors lands on our airports every day thanks to the fact that travelling is much easier.

This constant flow will soon overtake the domestic tourism in terms of numbers and expenditure. In macroeconomic terms, inbound tourism represents a big component of the destination country's exports whereas it is considered as import for the country of residence of the visitor. Globally, the worldwide tourist export is worth 7% of the total export with a contribution to the global GDP of 10%. As export category, tourism ranks third after fuels and chemical but ahead of food and automotive industry (UNWTO, 2016). Things are going to be bigger and bigger and some countries already have a proper strategy to improve their market share position. Is Italy ready to receive this astonishing amount? The key to getting through such a challenge could be Smart Tourism: an intelligent approach to manage tourists that may revolutionise our conception of "tourism" and "holiday". Analysing changes in the supply and the demand, spotting the main trends around this sector, and having a glimpse into the new possibilities offered by state-of-the-art technologies are the keys to taking full advantage of the Italian potential.

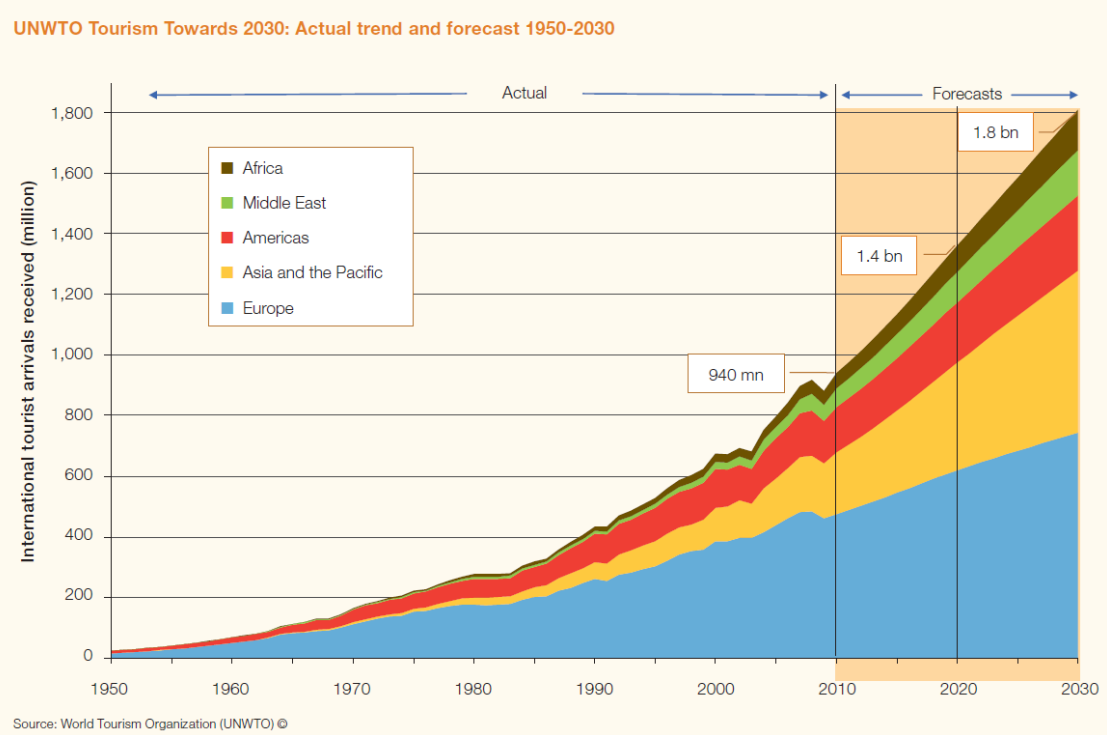
1.1 Tourism in Italy: actual magnitude and forecast

Over time Italy has been gaining popularity and estimation across the globe and even though it could be considered as an "old-fashioned" sector, tourism is still worth 11.1% of the GDP in Italy. Most importantly, having a glance at the employment flows that derive from it, it is estimated that 2,867,000 jobs in 2016 have been generated by the total contribution of Travel & Tourism. Total contribution stands for the general benefits coming from this sector in which

not only direct impacts are included: the WTTC analysis, in fact, adds all the wider impacts "indirect" and "induced" such as the purchases of goods and services made by the tourist companies to run their activities or the spending of those who are employed in the tourist sector directly or indirectly. Thus, we are dealing with an amount of activities that represent 12.6% of total Italian employment, without taking into consideration the black market labour which is structurally an inevitable side effect into this seasonal sector.

However, Italian T&T (Travel&Tourism) industry is far from slowing down and all the employment contribution is forecasted to rise to 12.8% by 2017 (WTTC, 2017). These numbers come at no surprise: From the 21st of April in 753 BC (the day in which Rome was founded) Italy has been the birthplace of the western culture and over the time it had had the opportunity to make many communities' acquaintance, perhaps mostly because of the ironic position of the boot-shaped peninsula right in the middle of the Mediterranean Sea. Consequently, this actual melting-pot fostered a huge cultural and natural heritage impossible to compare with any other country. Scrolling down the World Heritage list made by UNESCO, indeed, Italy ranks 1st as the country with the most properties requiring safeguarding: 51 sites, 4 natural and 47 cultural, more than the entire China following with 50, France with 45 and Spain with 42. This legacy is well recognized as after so many years the so-called "Bel Pease" is still worldwide known as one of the most attracting countries on the globe, indeed, with his 50.7 million international tourists' arrivals in 2015 ranks fifth among the top tourism destinations only after France, USA, Spain, and China. This astonishing amount increased by 4.4% in comparison with the previous year following the general trend regarding this phenomenon (UNWTO, 2016). Indeed, according to Tourism Toward 2030, UNWTO's assessment of the development of tourism, the figures related to the International arrivals (overnight visitors) are expected to grow by 3.3% each year on average from 2010 to 2030 ranging from 940 million to 1.8 billion globally speaking (Figure 1.1).

Figure 1.1 - UNWTO Tourism Towards 2030: Actual trend and forecast 1950-2030



Source: UNWTO, 2016.

This international incoming human flow should be well addressed since not only the figures around the number of international tourists are going up but also the estimation of their travel spending is expected to raise. Up to now, foreign spending is worth only 27% of overall spending (including the domestic one) but at the same time it is forecasted that this percentage is going to increase 5.3% by the end of the year, nearly 4 times more than the Italian internal spending growth (WTTC, 2017). Not just the quantity is affected but the quality of this type of foreign tourist plays an important role as well which should be analysed and planned. The land that is going to be visited should be well organized to receive and encourage at the same time such a huge international flow, more profitable than the domestic one.

1.2 Evolution of ICT: the rise of Internet of Things, Big Data and Cloud Computing

Gradually there will be more and more numerous crowds in our cities and, as a consequence, on one hand governments should enhance viability and accessibility to the venues, on the other, firms should adopt new ways of interacting and managing the tourists since tourism experience should be the "core product" in Tourism Industry (Buhalis, Amarangaana, 2015). Fortunately, the progress in Information and Communications Technology (ICT) is going forward, therefore,

both the actors have at their full disposal a plethora of solutions to take advantage of these numbers, not only from their point of view (profitability) but also taking into account the customer needs. The mixture of technologies based on Internet of Things, Cloud Computing and Big Data are revolutionising the daily objects that surround us.

Since the turn of the millennium, we get used to being connected with our smartphone (or tablet) first and then with the other people. But what could happen when even the objects we use start to be part of a network? The fun fact is that this scenario does not even represent a distant future, it is living right now. So-called "smart objects" are becoming increasingly part of our life, the main feature they have is the ability "to sense and communicating" (Hougland, 2014), they are able to measure first and transfer important data, secondly. To date, only a few things that surrounded us have had this capability apart from smartphones and other devices used on a daily basis: nearly 14 different sensors are embedded in a common smartphone: fingerprint, thermometer, barometer, light, proximity, and so on.

Over the last ten years the range of devices supporting the feature of "sense and communicating" is diffusely increasing and the noun "smart" is becoming a trending word linked to whatever object we use. For instance, today a smart thermostat installed at home is part of these "smart" devices: just like a normal thermostat which measures the temperature, with the huge difference that it is capable of capturing the home and away routine (e.g. what time the owner usually gets up or get back home). This is possible thanks to the ability to sense owner's position at home so that the smart thermostat is able to track your movements and then analyse your lifestyle adopting the control of the temperature to the specific owner's routine. Furthermore, it is even connected to the user's personal network so as its activity can be monitored everywhere, any time. Monitoring its activity makes people feel less stressed out thanks to the fact they are no longer forced to set the thermostat up every time and it is a proper way to save energy and money additionally (Hougland, 2014). Thus, we switched from the internet of people (world in which everyone is into a network with his smartphone) to the internet of things: everything is connected and communicates in our own network. The thermostat, indeed, is just a first "smart" example, there are many others regarding the way of living at home: lights, fridge, television, washing machine, etcetera.

The presence of these objects is expected to increase in the coming years so as to start a real growing sector that didn't exist before due to restrictions with technology: Smart Homes. Certainly, such a shift did not pass by unnoticed by the big companies, for instance, Google acquired the thermostat producer Nest Labs for 3.2 billion dollars in January 2014 and Samsung purchased in the same year for 200 million dollars a company called ironically SmartThings (Hougland, 2014). In a recent study about the Internet of Things phenomenon Gubbi J. and

other professors at The University of Melbourne claimed that “only in 2011, the number of interconnected devices on the planet overtook the actual number of people. Currently, there are 9 billion interconnected devices and it is expected to reach 24 billion devices by 2020.” (Gubbi et al., 2013, p. 2)

1.3 Impacts on communities

What if the ability of “sense and communicating” of your lights at home is expanded in the city you live in? This implies that all what has been said about your home can be adjusted to a bigger dimension in which thousands of people (and things) get access to a common network. Eventually, this paradigm brings to the concept of “Smart City” from which the city could gain a series of benefits in many areas across the city, ranging from the management and optimisation of public services to the collection of garbage and so on and so forth (Zanella et al., 2014). This would result in installing several sensors throughout the city which would be able to communicate with citizens and for those who are only temporary citizens, tourists. Indeed, there is a relevant link between Smart City and Smart Tourism and some recent studies confirm this correlation by saying that Smart Tourism should be put on the top when it comes to defining a strategy to build up a Smart City (Boes, Buhalis, Inversini, 2015). Both of them try to enhance the way of living of the people who are experiencing the city, it does not matter whether they are tourists or not. A local is satisfied as much as a tourist in seeing no garbage across the city or, for instance, when there is a low traffic congestion.

It is all about understanding which benefits could be achieved by the implementation of the IoT logic and which kind of sensor could be installed: in the garbage example, a quantity-based sensor able to measure and communicate afterwards the amount of trash in the container, as for the traffic congestion some GPS-based sensors can be used to monitor the traffic and sending police officers where needed. Similar devices could be placed on monuments as well, they could extract information about the status of the building in order to prevent erosion/corrosion over time. Cloud Computing and Big Data come into play then, when it comes to collecting and evaluating the huge amount of data coming from the smart things. The ideal recipient of this flow would be the policy maker who is supposed to take action and spot improvements on the status quo. Especially in Italy these types of solutions can be considered a first step to solve some of the main issues that affect the most problematic cities: trash in Naples, traffic jam in Rome, overcrowding in Venice, etcetera.

Private and public sector should team up to turn these cities into “Smart Destinations” as

intended by Lopez de Avila who defines them as "an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves resident's quality of life." (Gretzel et al., 2016, n.p.)

1.4 The close relationship between private and public sector

Thus, to make the tourism experience something memorable, a perfect logistic and flawless management of the public services are not enough. Every single person landed in a foreign city should be suggested about the things to do in town and further, he or she should be guided during this process step by step. In this phase, the public sector is not the main actor anymore, private firms, notably tour operators, are supposed to get in touch with this customer for the purpose to satisfy his/her needs. In a world in which everything is possibly customised, the tourist experience is not something to keep standard, exact the same for each and every tourist regardless of his own tastes or preferences. If a tour operator advised something ad hoc based on the customer personality, the percentage of success of the proposal would broadly increase (Buhalis, Amarangaana, 2015). It is pretty evident that the main goals of both actors involved (public and private) in the tourist process are the same: customer satisfaction and brand company/city awareness.

Nevertheless, the main issue related to this phenomenon is that one actor is not able to fully benefit from tourism without the other one. The aim of this thesis, indeed, is to demonstrate how the new concept of "Smart Tourism" can be only exploited in case a sort of "ecosystem" (Boes, Buhalis, Inversini, 2015) is created across the city including all the involved actors. This brief essay will take into consideration some of the best practices to imitate and possibly apply in Italy since it is still missing a fruitful collaboration between private and public around such a vital sector. In the Far/Middle East, some partnerships in this direction have already been made. They are focusing on the Tourism sector and apparently, they are completely right since the long-term forecast for international tourist arrivals in these countries will grow at double the rate of that in advanced economy destinations.

At the end of 2030, 57% of International arrivals will be in emerging economies versus 30% in 1980 (UNWTO, 2016). A symbol of this trend could be the Digital Concierge in Singapore, already projected in June 2007 and launched in 2008, a smartphone application that represented a real personal concierge: through the app the tourist can get access to attractions, restaurants, activities, based on preferences and location. Moreover, as it is mentioned in the first

description of this ground-breaking app: "real-time information such as the latest retail promotions and event updates will also be available. Users can further tap into an online community for reviews and to contribute their own comments, photographs and other media" (iDEA Singapore, 2007).

This thesis will be divided into several chapters in which the first one aims to represent a general summary of the current trends happening in the tourism sector that may radically change what we intend for "holiday". Next, there will be a description of the three foundations of Smart Tourism: Smart Destinations related to the progress in ICT behind this phenomenon, Smart Experience associated with the customer treatment, and "smart" ecosystem representing a practical way of doing business (both for the public and private sector) in the light of Smart Tourism.

2. Trends in tourism

This chapter aims to represent a general summary of the current trends happening in the tourism sector that may radically change what we intend for "holiday" and "tourist". Most notably, these paragraphs are meant to show the economical and sociological factors that are affecting both the supply and the demand within this sector. As for the tourists, they radically changed the way to sense the holidays: being connected throughout the day is a sort of must. They love to share photos and have a say in the matter of restaurants, hotels, attractions in general and they strongly need an online translator if the local language is barely known. This virtual reality affects the supply as well as it starts receiving more and more reviews about their activities.
Privacy related issues are one of the most controversial concerns around Smart Tourism because of the fact that Wi-Fi is not totally "free" most of the times. In fact, the supply tries to extract data about the demand while exploiting a general lack of legislation around this matter. There is the same lack of regulation about the overcrowding, a big challenge occurring in the tourism sector in the last 10 years. Cities are getting more and more famous and not every city is well prepared to receive a huge mass of tourists, in particular when the natural and cultural heritage is at stake. Both the supply and the demand are suffering from these human flows, someone thought to cap the number of tourists by introducing timeslots in an effort to find a solution. Instead, only a structural stance could solve this subject totally without any loss from one side or the other.
The following paragraphs provide a brief overview of one of the main current trends around tourism, of which one is relative to "tourism" as topic in the tourist specialist literature. Describing and analysing these trends is essential to grasp what kind of tourism is ahead of us. In the light of the said trends, Smart Tourism would seem an automatic shift to intercept customers and firms' needs.

2.1 The popularity of the cities

In the "World Urbanization Prospects 2014" Unite Nations affirmed that for the first time in the world history, the global urban population exceeded global rural population, currently the 54% of the total population resides in cities and over 66 people out of 100 will be urban by the end of 2050. More job opportunities and more services are the main drivers of this demographic shift that includes every single region in the world. Such a huge transformation has been seen by some studies around city tourism as one of the reasons that will bring people to be more associated with cities and consequently more wishful to visit other cities (Travel and Tour

World, 2014). Moreover, since the air transport liberalisation process came to an end in the late 90s, low-cost companies (notably Ryanair and EasyJet) conquered relevant market shares with the end result that travelling is much cheaper than before. People can easily afford short trips nowadays, indeed, especially in Europe, numbers of passengers and airports is increasing over time and cities are one of the main beneficiaries as they are departure/arrival point (Eurostat, 2016).

But according to ETOA (Europan Tourism Association) and other recent studies about tourism (La Rocca, 2014) there is one more reason why cities are getting more popular when it comes to organising a trip: technology. It enables people to be more aware of the surroundings and at the same time more harmful as its echo is broader than before. The arise of a new type profile of tourist, so-called smart tourist, is pretty visible and his main characteristics are: he is cultured, connected, media expert, informed, active, critic, demands high quality level of personalized services, shares sentiment and impression by social media, contributes to creating his personal tourist experience, desired to be involved in the social life.

2.2 Creating network during the holidays

Such a description puts more emphasis to the connection between this smart tourist and the city itself: they know (or at least they would like to) everything about restaurants, attractions, things to do and they are even ready to contribute to increasing this amount of data through good/bad reviews, comments, photos: this kind of behaviour has been named as “prosumer” (Ercole, 2013). People are involved in a sort of network of contacts with whom they are willing to share their emotions, feelings and experiences, regardless of the fact they are positive or negative. Not only through social media but also through official websites well-known to be read by most of the travellers around the world, they can write a review which can be visible by a broad audience and which could have a terrible impact on the image of the venue/attraction. A side effect of this phenomenon is the space covered by the Customer Service department in a tourist company, that is the only antidote to this power: more and more presence on public websites such as TripAdvisor, Trustpilot, Facebook. In fact, according to the survey “The 2014 Traveller’s road to decision” by Google for 7 out of 10 tourists the internet is the top source for both leisure and business travel planning. That is the reason why companies want to ensure a good first image when tourists surfing the net, they do not trust the official website anymore because they would like to see pleasant opinion written by the previous guests.

Part of this network that the tourist aims to build is represented by the housing hospitality business. The smart tourist by now is not satisfied anymore to stay in an anonymous B&B or

Hostel, he/she really would like to fully dive into the city he/she is visiting. Representing also the cheapest solution to travel, such a huge business is increasing in the wake of new business models like Couchsurfing and Airbnb. Both consist of locals who are willing to share their couch/room in order to host some foreign visitors at their place, sometimes even free of charge, just for the pleasure to share ideas while having good conversations. The latter is mostly catching on in Italy where one out of five properties in the city centre of Florence is intended to host tourists and this amount is even more gigantic in the historical city centre of Matera where nearly the 25% of the total housing stock is provided on Airbnb. The negative side of this process is that cities empty little by little of natives whereas the quote of temporary residents grows. Some studies have called "Disneyfication" of Italian cities this phenomenon because they are turned into a sort of theme park in which literally everything is set up for the average tourist and not for the permanent resident (Haines, 2017).

2.3 Digital connected tourist

Smart tourist loves to be connected as well by definition, that is why the flashpacking is a sort of a way of travelling that is catching on which consists of bringing whatever device related to technology: ranging from your smartphone to your professional camera. While packing this kind of people prioritise the technological component in their trips even though more and more people actually are digital "elastic" (Tanti, Buhalis, 2016) in terms of being capable of disconnect and connect as they please. The idea of holiday as period of total rest and isolation from the rest of the world has given away with the contemporary young travellers, they really want to be able to share with their friends what is happening during the trip (postcards are old-fashioned) and after all they are forced to be online to handle some smart tasks during the trip: using maps, buying tickets online, selecting the best restaurant, reviewing and so on. Indeed, the phases pre-trip and post-trip after the progress of ICT have shortened in favour of a last-minute organization, the plan of the trip is more and more an on-going process by now: the tourist decides by surfing the internet and scrolling up and down which restaurant, museum, attraction, house would like to deal with. Almost nothing is planned at home and, in this manner, nearly nothing related to the trip is done during the post-trip.

Interviews conducted by Adrian Tanti and Dimitrios Buhalis (2016) regarding international tourists and how they perceive the connectivity so as to highlight the factors that boost or discourage it. At the end of the vis à vis interviews one of the main elements that push the tourist to be connected is the feeling to be unfamiliar with the country he or she is visiting because of the language or the customs used in that country, therefore, in order to overcome the

language barriers, for example, between the international tourist and the local, the use of Google Maps, for instance, is preferred to the usual query face to face or a visit into the city's official website is favoured to a question to the public officer. As mentioned above, digital devices play a fundamental guide-function over the trip, that is the reason why having a global tourist support in several languages to guide foreign tourists is fundamental for their satisfaction. While in contrast, the cost that these foreign tourists had to pay for obtaining the internet was certainly among the main discouraging reasons, even though it is essential to mention that as from the 15th of June 2017 the roaming will not incur in any extra charges while travelling across the European Union, therefore, even more people are expected to use Internet connection overseas, at least in regard to the European travellers (European Commission, 2017).

2.4 Privacy concerns

Being connected is one of the main features of the average international tourist, they are connection-addicted and once many places (bars, cinemas, restaurants) understood that, first samples of "Social Wi-Fi" (Tanti, Buhalis, 2016) are appearing: Wi-Fi that allows you to get access to the hotspot only through logging in your personal social network account. Thus, customers are able to satisfy their connectivity-related needs and companies can use this tool as a chance to retrieve important data about them. That is the main reason why these free hotspots are free of charge: the exchange of data that can arise is very helpful for the company's management as means of understanding and analysing its target. The amount of data that can be pulled up from these tools depends on the Wi-Fi provider but as the law regulation is missing in this field, there are several privacy concerns that may occur: are they entitled to gain so much info about their customers? Are they warned about that when they accessed the first time on the platform?

In any case, regardless it is used a personal connection or a Wi-Fi network provided by the restaurant or Smart Destination itself, it is needed to accept some terms and conditions before both using any app present on the app store and getting connect through the Wi-Fi hotspot. The concerning trend is that people usually do not read properly those clauses because they treat them as a part of the installing process, therefore, they end up accepting all the endless text carelessly. A shocking flawless experiment was conducted in June 2014 in the middle of London, one of the busiest tourist areas in the world, with the aim to show how is simple to get private information by creating a free hotspot that users can use without any kind of data limit not until they agree on an endless text in which a special "Herod clause" was included: whoever signs that contract should give up his first-born child "for the duration of eternity". What about

the outcome of this experiment? Only in the first half an hour, 33 attempts of connection were established, of which 6 got through: 6 children were given away the proprietary of the hotspot. Certainly, the provider denied its intentions to go ahead and enforce the contract but such an experiment demonstrates, once again, that people are willing to do anything to get connection on their smartphones (Dearden, 2014).

2.5 Managing flows: overcrowding

Flows of people looking for something different to visit, enjoy, and live. That is the most common definition of tourism as a phenomenon in which the movement of people is, in fact, an automatic consequence that is very fruitful and favourable when suitable for the dimension of the city or venue, otherwise, it may cause negative effects that could overtake the benefits over the long term. The figures shown above in the first chapter would be a bit frightening then, in the light of millions and millions of new tourists, notable from the east part of the world, who are ready to land somewhere their parents were not even aware of.

The more people get in a place, the less they can freely behave as they wish. Regardless of the dimension of such a "place", this paradigm is valid for the cities as well where overcrowding is becoming one of the principal problems that the public administration is forced to face because of his negative impact by now. Air and noise pollution, disrepair, threat to natural and cultural resources, and destabilisation of the residents' way of living are the key drivers that could prevent the local administrator from encouraging the tourism. The obvious example that comes up to mind when describing this pessimistic scenario is the most famous lagoon: Venice. Thousands and thousands of tourists every invade the ancient Serenissima and nearly as a pilgrimage automatically head towards St Mark's square where in the most chaotic summer days it's almost impossible to walk around. It is really hard to find here the party at fault since it is totally legit the fact that such a huge flow has a specific direction, indeed, the most famous attractions and "things to see" in Venice are exactly located around that quadrangular square. Given it's quite impossible to prevent people from making that particular path, the public administration along with the main tour operators and OTA should design an effective plan for the purpose of managing and controlling the flows.

Understanding the concept of Smart Tourism could be a valid starting point to change the current point of view. Lack of awareness of other venues as much attractive as the ones located around St. Mark's square is a real solution that could disperse the huge stock of people more consistently across the lagoon: if the tourist had the chance to get a brief guide of everything is worth to visit at the beginning of his stay, the said pilgrimage would be less packed, especially

if this guide is linked to a support that aims to personalise the tourist experience. Every person would create his own experience based on his preferences and it will be much less likely to find at midday most of the tourists in one single point. This would result in a double benefit aside from the advantage for the city: from the customer point of view the experience would not diminish in value and from the economical point of view even some little businesses far away from the crowded places can get more visibility than before.

Further, there are other experimental ways deployed to manage tourists, always more effective than the recent decisions about the same problem in Venice. In the current year, in fact, the ideas that the major and his administration are thinking about aim to stop people from walking around St Mark's square by the introduction of an insurmountable cap (Push, 2016) is anachronistic. This is a tough call in an attempt to solve the emergency as from the short term. Nevertheless, Venice needs a structural solution to overcome the overcrowding not to sacrifice tourist's satisfaction and the whole economy around the tourism. The theme park Disneyland, for instance, could be considered under this perspective a little Venice: tons of tourist get the turnstiles every day, everyone hoping not to find a long queue for each attraction. Their management guided from the customer perspective implemented the Radio Frequency Technology embedded in some bracelets as a means of retrieving important information (encompassing the position) about the guests on that day to better control the congestion in the park while offering at the same time dedicated reservation slots to book before arriving at the park. The guest knows which attraction and what time he is supposed to go to from the very first moment, meanwhile, the management team can monitor and evaluate the congestion in each attraction to take action if needed (Disneyland, 2017).

3. Smart Destinations

This chapter is focused on analysing one of three foundations of Smart Tourism: the Smart Destination. This part of the thesis aims to highlight what that adjective "Smart" stands for and what are the technologies and the practical applications involved. Particularly, without being "Smart" in terms of technology, Smart Tourism does not come into existence. The last paragraph will represent a general overview of the new wave of technologies described in the first chapter.

There is an unexpected turmoil over the research of the tourism sector. The word "Smart" has been acquiring popularity for the past 3 years in the wake of the new Smart City world trend. Seemingly, researchers are expanding the latter topic in the interest of those citizens who are in town temporarily (Boes, Buhalis, Inversini, 2015). Next to a massive Smart City literature, indeed, the focus on the Smart Destination meant as a source for attracting international tourists is increasing and the importance of ICT in this field is analysed more practically through some pilot programs. However, these projects are still stuck in the early stages, therefore, the application of the principles of Smart Tourism is relegated to some small activities. The lack of a business model already tested and proved as effective is one the main handicaps of this new trend. Even though the technology is ready to be used and the said important trends happening to the average tourist over the recent years go in the same direction, both the public administrations and the private companies cannot see any example already functioning somewhere else. Nevertheless, the goal of this thesis is to explain the technologies suitable in this field and indicate how they can be used to make margin for all the actors involved. The description of these cases is encompassed in order to underline the differences between the old concept of tourism and the new one. The examples cited in the fourth chapter will be little in dimension, scalable though.

In the wake of the said Smart Destination definition by Lopez de Avila, Smart Destinations' key characteristic is integrating physical infrastructure with digital infrastructure to enhance the urban experience in the city. Even though "Smart" seems to have become a vague word to point out everything that encompasses a bit of technology, the concept of Smart Destination is strictly better defined and is linked with the concepts behind the Smart Cities. The recipient of the latter are the permanent residents whereas as for the Smart Destination tourists are the target, but the tools and the purposes are pretty much the same. Although there is no widely accepted definition about them, it is pretty clear the final end to which Smart Cities should get closer: "the final aim is to make a better use of the public resources, increasing the quality of the

services offered to the citizens, while reducing the operational costs of the public administrations" (Zanella, Vangelista, 2014, p.1). Regarding the tools to be used to accomplish that purpose, the Internet of Things plays a fundamental role thanks to the large plethora of possible applications. In June 2015, the McKinsey Global Institute published a summary about the potential economic value that could be produced by the application of IoT to certain economic fields and one of these 9 groups was represented by the Smart Cities which was forecasted to have one of the broader economic impact of 930$ billion to 1.6$ trillion per year in 2025 since they claim "cities are the engines of global economic growth: the 600 largest cities in the world are expected to generate 65 percent of global GDP growth through 2025" (Mc Kinsey Global Institute, 2015, p.9). According to this publication, public transportation embodies the largest application of IoT which is a sector that can easily be exploited in Smart Tourism. Not only citizens, but also tourists prioritize the public transportation to get around the city. In fact, across the globe, numerous examples of applied-smartness are coming into existence.

There is a special bus shelter in Barcelona, a sort of an interactive touch-screen platform has been installed. Pedestrians who are about to get on board can get access to the bus arrivals in order to make sure to get the right bus. Further, a city map in which every point of interest is underlined is available through the touch screen as well as dynamic digital advertising is shown. In addition, a series of technologies are embedded in order to provide the pedestrian with all information about the city and the surroundings: Wi-Fi connection, NFC (Near Field Communication), QR Code as well as a USB port to charge the phone (Wachira, Karthik, 2016).

Figure 3.1 - Smart Bus Shelter in Barcelona

Source: Wachira, Karthink, 2016.

3.1 Technological foundations: IoT, Big Data, Cloud Computing

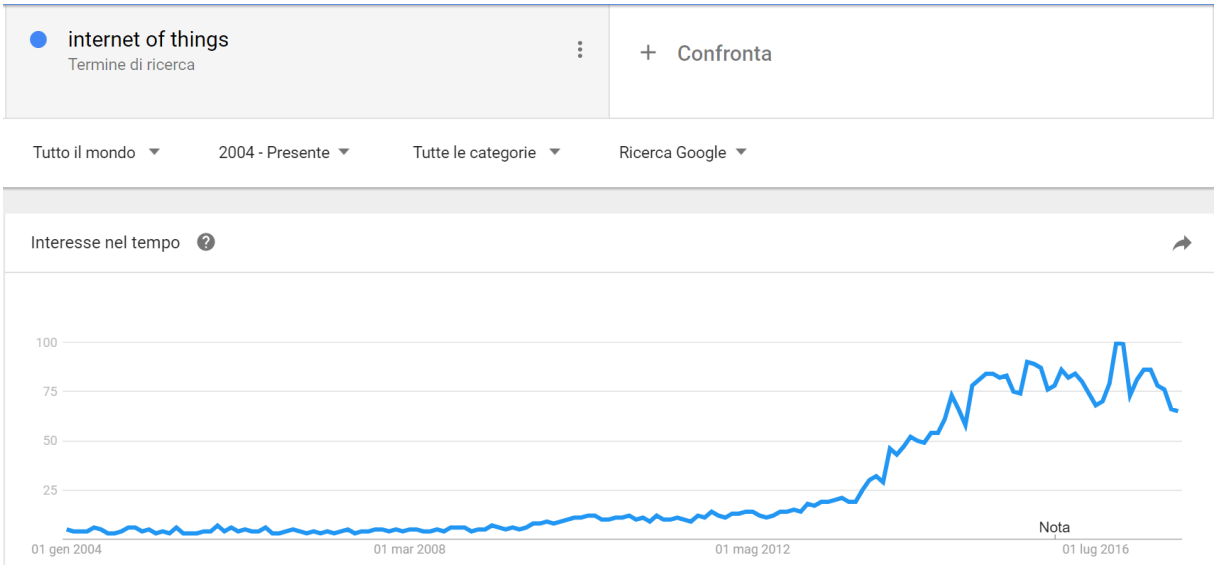
Gartner's Hype Cycle is a leading graph consulted by the most innovative CIO (Chief Innovator Officers), R&D departments, and business strategists to get a summary of the "set of technologies that is showing promise in delivering a high degree of competitive advantage over the next five to 10 years." (Gartner, 2016, n.p.). It comes out every year and it is a real bible for the innovators, over 2000 technologies are analysed and only the most worthwhile are listed afterwards. IoT has been classified among the most profitable emerging technologies by Gartner's analysts. IoT platform ranks among the technologies with the major expectations that are going to reach their mainstream adoption in 5 to 10 years (Figure 3.2). This news comes at no surprise since IoT is being globally accepted little by little. Over the last two years, IoT has become a sort of mantra people hear throughout the day and more and more people are searching for it on the internet. The figure 3.3 demonstrates that the popularity of such a term is increasing all over the globe. In this regard, Google Trends tries to calculate the interest around a specific topic through the number of searches made for it over time. The searches associated with those words peaked last year after a 10 years span of time in which barely someone was aware of this new technology. Such a phenomenon is getting famous and for some scholars (Gubbi et al., 2013) these trends reflect a sort of social acceptability of the technology: people get a glimpse of what IoT future may bring thereby being willing to try the state-of-the-art devices.

Figure 3.2 - Hype Cycle for Emerging Technologies

Source: Gartner (July 2016)

Source: Gartner, 2016

Figure 3.3 – Google search trend since 2004: Internet of Things



Source: Google Trends (www.google.com/trends)

The expression "Internet of Things" was used for the first time in 1999. Even though the British technology pioneer actually named "Internet for Things" what was happening in P&G's supply chain at that time. Kevin Ashton coined this idiom to describe a new close interaction between digital and physical world through which every single product could have been tagged in the supply chains without the human intervention thanks to a simple internet connection (Mulani, Pingle, 2016). RFID (Radio Frequency Identification) technology was the direct responsible for coming about this remarkable interaction that is based on wireless data communication which enables some electronic microchips to act as digital barcodes. In the corporate supply chain, these electronic barcodes can be used to track goods or anything else they are attached to. At the end of the process an automatic unique identification will be established between objects (things) and internet (Gubbi et al., 2013).

Currently, RFID is still a backbone of the "Internet of Things" even if the plethora of objects capable of being identified within a unique network increased a lot. In fact, the next revolution around the internet will lead to an interconnection between things instead of people. The wireless connection that up to now it is being stressed by other technologies such as Bluetooth, Wi-Fi, NFC (Near Field Communication), QR Codes, and barcodes. The common principle is the same: trying to make objects like a sensor to install and measure whatever it is useful to get in a short distance. This results in a "Smart Environment" as defined by Mark Weiser "the physical world that is richly and invisibly interwoven with sensors, actuators, displays, and

computational elements, embedded seamlessly in the everyday objects of our lives, and connected through a continuous network" (Weiser, Gold, 1999, p.693).

Overall, the interrupted flow deriving from the objects associated with a particular network may negatively impact on the storage of the data and the visualisation of them as well. The quantity of data produced is too big to store every bit in a specific point, therefore, Cloud Computing represents a perfect escape route. This platform can play the role of a virtualised storage that is able to receive the enormous amount of data, analyse them and make them easily readable in a seamless form by the end users. It is very critical get people to access this kind of data from anywhere and any time that is the reason why this web-based technology represents the best alternative to handle the information. Moreover, the reliability of such system is emphasised by the scalability of the platform: the capability of adapting the dimension of the system to the variation of the amount of data. Particularly, as the shift from 2D to 3D screens will be much more visible in the future, it will become urgent the need the show more information on demand of the user (Gubbi et al., 2013).

The applications of such technologies vary based on the dimension of the network the objects are connected with. Ranging from a little personal network to a broader community network the flexibility of the installation of these sensors helps the IoT technology to grow. The said example about the Smart Home could be a good example applied on a little scale but the major potentialities derive from the interaction between large community and connected things. As described in the first chapter, there are several chances to implement this technology: traffic congestion, water consumption, parking availability, public transportation. Enhancing the community's quality of life by improving the efficiency of these service is the common denominator of these initiatives. To be fair, in these contexts the available amount of data is too huge and heterogeneous and the main problem becomes how to isolate the unnecessary information instead of capturing those ones. That has been made known as the Big Data revolution in moving from "data scarcity to data abundance that is the data deluge phenomenon" (La Rocca, 2014, p.277). Furthermore, in this case, apart from the enormous quantity, analysing the real-time data flow and making it accessible to the users instantly is the main trouble of managing this type of data.

Moreover, the major issue to face when it comes to storing and analysing this kind of broad network is related to the heterogeneity of the data acquired. Especially in relation to the IoT technology applied to the big communities (e.g. Smart Cities), the data interpretation has to deal with a lot of different sensors which are measuring various things on a distinct scale.

3.2 Evolution of the e-tourism concept

When a couple of decades ago ICT entered for the first time into tourism sector, scholars were all certain in defining that new era of tourism as "E-tourism". At that time having an online website section in which the customer was able to buy his tickets up front was shocking. Simultaneously, the fact that every single user could have all the information regarding the venue he was about to visit just with a couple of clicks or the chance to review the same venue after the visit were considered as the ultimate frontiers of tourism. In the coming years, through the arrival of new types of ICT, things will not be steady as usual within this sector. IoT, Cloud Computing and Big Data and their practical applications will definitely upset the environment in which they will operate. Smart Tourism, indeed, is changing the actors' role into this game because of the central position the public sector is acquiring. Private sectors cannot afford the early stage to build such a gigantic urban platform so they are forced to rely on the public institution as years ago, at least at the beginning of the initiative. As will be particularly described next in the thesis, it becomes fundamental a proper collaboration between public and private actors, otherwise, no smart project is possible to be achieved.

Furthermore, through this new wave, the physical sphere becomes again essential to enhance the customer experience, the paradigm of "everything is digital, virtual" ends. Customer has the chance to touch with his own hands what Smart Tourism stands for because the interaction between the tourist and the infrastructure is vital for the existence of the platform itself: customer becomes "prosumer" (Ercole, 2013), he does not represent the simple consumer, he produces contents too.

The timing of interaction is different as well: booking online or reviewing a hotel encompasses the pre/post-travel experience only, the "during-trip" phase was almost totally excluded from the ICT revolution. In contrast, Smart Tourism is built on a real-time interaction basis which is established at the exact moment of the visit. It is not needed anymore to plan the experience at home or during the journey, tourist can acquire all the information regarding the venues and act accordingly when he already landed. That is the reason why the focus is on the experience itself, defined "smart" due to the fact that users are forced to interact with technology.

Gretzel et al. in their research named "Smart Tourism: foundations and developments" have tried to highlight the big changes in between E-tourism and Smart Tourism through a simple table divided by area of interest.

Figure 3.3 - E-Tourism vs Smart Tourism: analysing differences

	e-Tourism	Smart Tourism
Sphere	digital	bridging digital & physical
Core technology	websites	sensors & smartphones
Travel phase	pre- & post-travel	during trip
Lifeblood	information	big data
Paradigm	interactivity	technology-mediated co-creation
Structure	value chain/intermediaries	ecosystem
Exchange	B2B, B2C, C2C	public-private-consumer collaboration

Source: Gretzel et al., 2015, p. 182

4. Smart Experience

The Experience Economy is a book written by B.J. Pine and J.H. Gilmore in 1999 that created quite a stir when published. It claims that after the revolution and growth of services, better known as servitization, in the whole economy, the experience will be the key driver of innovation in the near future. According to the authors, there are several examples of successful firms in the reality in which the application of this new type of economy comes true. Every single company should be focused on selling an experience of its products/services, not the mere products/services themselves. In other words, as described in the book, "companies stage an experience whenever they engage customers, connecting with them in a personal memorable way" (Pine, Gilmore, 1999, p.3). They demonstrate that the more a customer is mentally/physically/culturally involved with what he purchased the more his willingness to pay will increase as well as the profits for the companies. For instance, even though the flavour of coffee is more or less exactly the same at each bar in Venice especially for a not addicted customer to the coffee industry, at Caffè Florian in St. Mark's square people are willing to pay about 15€ to experience that cup in the main square of the most romantic city surrounding by all the Venetian atmosphere. That is not a run-of-the-mill espresso, it is the real Venetian espresso in line with the overall cultural context. Such an experience will be then remembered with all the family for years to come so that the paid amount will look like a reasonable bill eventually.

In the coming years, the emphasis on the experience per se will play a fundamental role in tourism because of an increasing worldwide competition that encompasses each corner on earth (Pine, Gilmore, 1999). There will be always a look-alike alternative somewhere else and involving the customers, or to be more precise "guests" (Pine, Gilmore, 1999) will be the distinguishing factor for the final choice. Indeed, Smart Experience is the second main backbone of Smart Tourism in which the main goal is to draw attention to the customization of the touristic experience in order to try to tailor the most suitable holidays for each one. Through the state-of-the-art technologies, the customer could be involved in the itinerary making process from the very beginning. The best tool to personalise the experience is the tourist itself, he only knows which attraction or event is the perfect one at that time. The decision maker always remains the same because the technological support should only show all the possible alternatives and try to inspire the guests at the same time.

It is hard to find some practical smart tourism business models already tested and functioning, and it is a hassle to spot some Italian examples. As already mentioned in the third chapter, Smart Tourism is lacking successful cases of comprehensive platforms which enable the tourists to

experience a unique trip by using technology. Nevertheless, many cities in Italy are starting to innovate in this field as well, and a couple of them are standing out from the crowd at European level. Observing the European Parliament's study "Mapping smart cities in the EU" conducted in 2014 confirms that Italy is drawing attention to such an advanced theme. Indeed, Italy presents a high density of smart cities comparable to the most innovative Scandinavian countries. The cities of Trento and Florence are part of this "smart" list, and some of their pilot projects, in fact, encompass Smart Tourism initiatives including all the main features descried in the figure 3.3. In this chapter, indeed, two recent Italian examples of Smart Tourism will be shown. Obviously, both of them focus on the experience itself: the tourist is not obliged to plan or gather information about the city upfront, he just uses the technology provided by the place to enjoy his visit. Digital and physical world interact with people in different ways, in the first example, TreSight, the tool used is a simple bracelet whereas in the second one, MyFirenze, the physical world is represented by an interactive wall. However, the big difference between the cases study is the moment of interaction with the tourist because in TreSight the personalisation of the experience happens in continuum along the trip while the starting minutes of the visit are vital in MyFirenze even though it is possible to modify the planned experience in a way. In the end, there are two concrete evidences of Smart Tourism application that could represent scalable business models to be applied at a national level hopefully.

4.1 Personalized experience through a context-aware recommendation system

We live in a world in which every company tries to personalise its product to their customers, tracing the customer they are dealing with in order to offer the best product or service among the competitors (InterContinental Hotels Group, 2014). Loyalty cards or online suggestion boxes based on the previous purchases are the most famous tools to grab all the appropriate data to make an offer relevant to the customer's eyes. In the wake of this mindset, from the other hand, the demand changed due to the fact that the consumer expectations increased. They demand that products should fit them according to their needs and preferences, otherwise, they just try to look for the same product in another store. They do not tolerate the possibility that a company cannot tailor a product or service following the customer needs.

Particularly, the need of personalisation is well borne in mind by travellers coming from emerging countries, their expectations about it are much higher than those from developed countries. As suggested in a study in the hospitality sector conducted by InterContinental Hotels Group in 2014: "78% of Russian and 64% of Chinese expect a hotel to tailor the experience

they have to their personal needs, compared to 43% of US and 42% of UK travellers" (InterContinental Hotels Group, 2014, p. 19). In Smart Tourism paradigm, international travellers are the main target of such a technological support, therefore, these data show that it is very noteworthy to draw attention to the personalisation concept when applying new technologies to the smartness of tourism.

There are several chances to seize where the recent high-tech innovations meet the average traveller. Indeed, using a location based and context awareness system by deploying a plethora of sensors around the main points of interest within the city, both public and private actors can provide the tourists with specific offers regarding places to visit or dedicated promotion to take advantage of (Buhalis, Amaranggana, 2015). It is more likely these real time offers to be accepted thanks to the fact that the effort to accept them is very little: the proximity to the venue to get is very close to the current position. Moreover, the positive response is even closer if the marketing massage makes the target feel important and unique in comparison with the other travellers or it contains an implicit meaning "last minute to enjoy this service". An unexpected short queue in a popular museum could be a perfect message for a tourist during his last day of holidays. Equally, if there is just one table left at the restaurant around the corner during rush hour, the visitor is more than happy to have a seat, even though the price would be a bit higher. Tracking the positions throughout the day and collecting them to provide him with offers that fit him based on the previous visits could be a step forward that deals with ethics, though. As already mentioned in the second chapter, even if people are more willing to give up part of their privacy to get a useful service, the problem remains the way all these data would be used not in the right hands.

In contrast, it is enough to keep every single ID anonymous to collect and analyse them afterwards. On behalf of the public actors, the said potentiality of Big Data coming from the huge amount of information gathered represents a perfect tool to spot some improvement with regards to trends and statistics "for prediction and prevention (e.g. expected visits for specific places, and the expected crowd areas)" or to get relevant insights about the "events and situations correlations, such as weather influence" (Sun Y. et al., 2016, p.769).

4.1.1 Evidence from TreSight

Trento has been nominated "IEEE Core Smart City" alongside Kansas City, Wuxi, Guadalajara, and Casablanca in the context of "IEEE Smart City Initiative", a IEEE project that aims to help municipalities in managing the people involved through a conscious use of technology. IEEE, indeed, is a world leader organization focusing on technological innovation for the benefit of

humanity. TreSight is in fact one of the projects coming from this initiative that suggest proposals to enhance the quality of life in Trento, proposed in 2016 but never came to life.

The undertaking is based on personalising the tourist's experience through a context-aware recommendation system that is capable of delivering real time proposals to the tourist. A bracelet given by the tourist information point of the city at the beginning of the stay is the tool used to apply such a system. This wearable sensor has to communicate with the tourist's smartphone through which the real time offers will be shown, the bracelet, indeed, is needed to track the position and interact with all the sensors embedded within the city. For this purpose, each so called point of interest should be provided with a hotspot that is capable of tracking all the incoming and outgoing tourists, sensing particular actual characteristics of the venue such as weather, humidity, crowd, temperature, reservations, etc. In addition to these gathered data, Open Data Trentino, an already existing platform open to the general public, can be a basic information support to provide the tourist with relevant tips regarding not only Trento but the region overall[1].

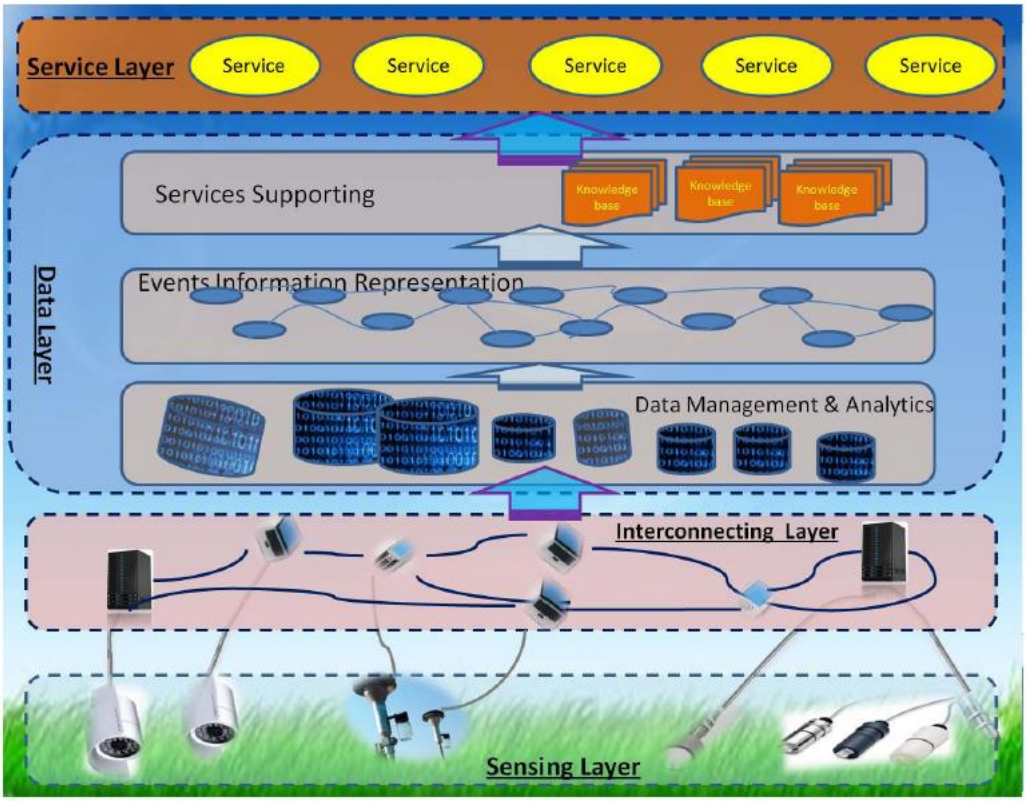
It encompasses static data about potential points of interest, retailers, workshops, restaurants, and pharmacies including geographical coordinates, contacts and a brief description. Moreover, weather forecast are available in real time through the same platform: it communicates with every weather station placed on the region so it enables the tourist to get dynamic data based on his position.

Then the data gathered from people, hotspots, websites will be processed by FI-WARE technologies, a European co-founded platform that enables developers to ease the use of Big Data, Internet of Things, Open Innovation and Cloud Computing into the context of Smart Cities. The specifications of the functionalities are completely public and royalty-free so as to ensure an active participation and innovation of the software. The data management represents the second and third layer of the overall process: after catching all the information through sensors a transmission among different domains and devices is needed, and eventually the data must be stored and analysed in order to extract the relevant facts only. The services provided at the end user represent the last layer of the process in which the meaningful information is delivered in an efficient and understandable way (Figure 4.1). A huge range of services may be provided within TreSight concept, moving from practical information about the public transport to cultural data regarding the heritage around the city. Yet the trait d'union between the people and the tourism firms remains a fundamental feature of this ecosystem. The platform helps both

[1] More information can be accessed at the website: http://dati.trentino.it/group/turismo.

the counterparts interact with each other creating a win-win situation in which customers are better targeted and firms can provide services that are more likely to be accepted.

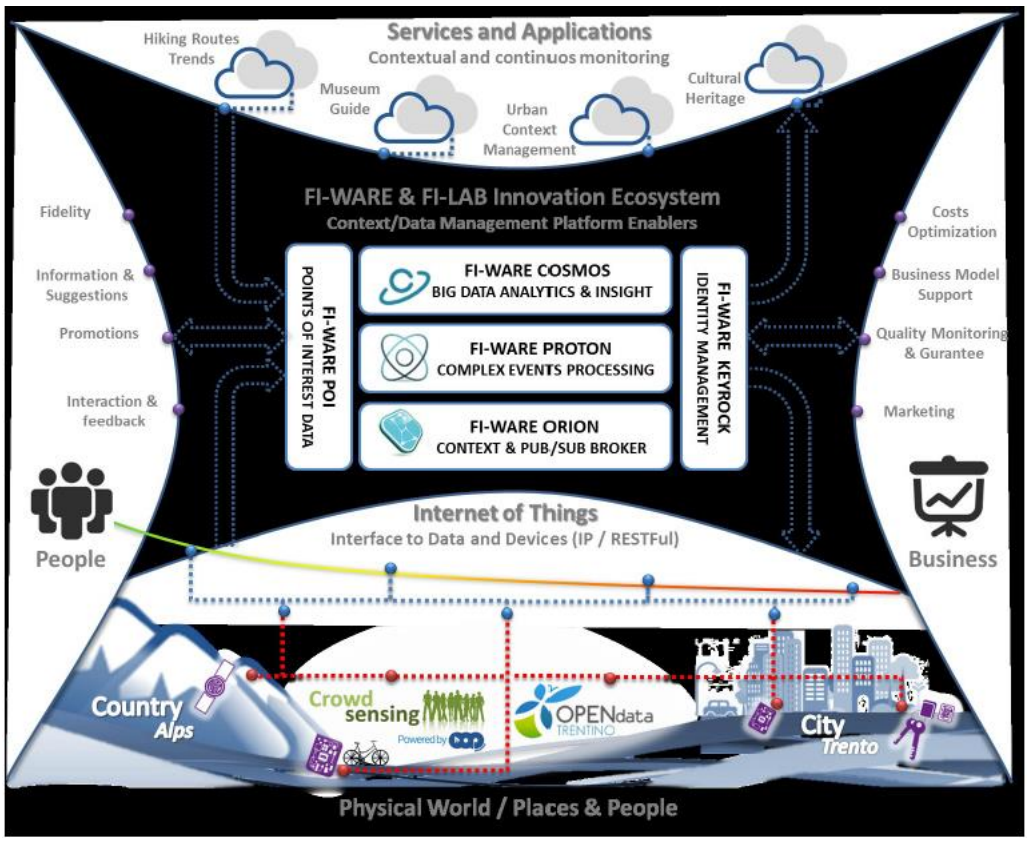
Figure 4.1 General function architecture of Internet of Things for Smart Cities



Source: Sun et al., 2016 p. 768

Figure 4.2 summaries the conceptual architecture of TreSight taking into consideration the four layers described in the previous figure. Sensing Layer, Interconnecting layer, Data layer, and Service layer are put into practise to show how the theory becomes reality.

Figure 4.2 The conceptual architecture of TreSight



Source: Sun et al., 2016 p. 770

4.2 Co-creation of the experience

Customer involvement in Smart Tourism is an ongoing process that requires the technology to be a tool throughout the holidays. Just like in the said recommendation software, the tourist decides the venues to visit based on the provision of real time offers aiming at a diverse experience that is more likely to be memorable. Yet, the exchange of information takes place only when the customer is close to the attraction or nearby.

However, it is possible to establish another form of engagement focusing on the very first moment of the visit. The opportunity to get inspired and plan by himself the whole itinerary around the city can be given at the very beginning to the tourist. Certainly, also in this case, the technology plays a role of support in this process by providing him with all the relevant data to perfectly embark on a customized experience. He acts like a proper travel agency that is going to sell a planned tour: starting from his preferences it is given the chance to project every single moment of the holiday with accuracy.

The reflection about the co-creation of the experience was already brought up by Prahalad and Ramaswamy published in the Journal of Interactive Marketing in 2004. They asserted that the

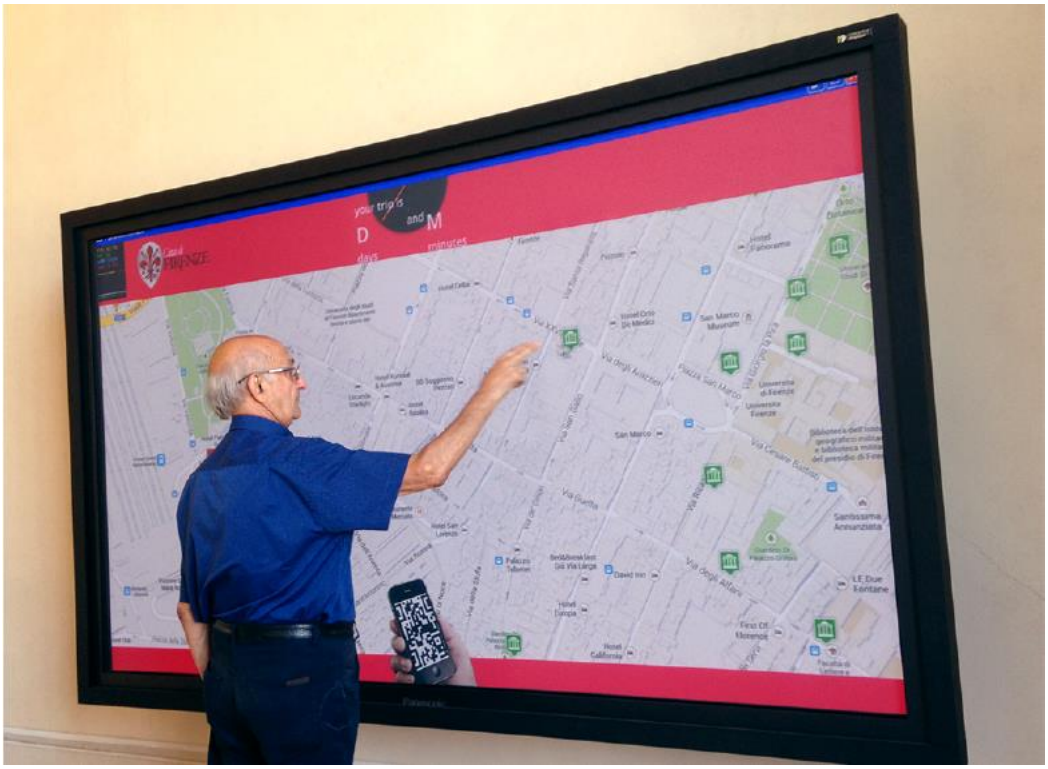
traditional market logic in which there are active firm and passive customers ready to receive firm's offering is disappearing. Within the new market logic, customers play an important role and become active: they can co-create the product value if the firms allow them to interact with every single part of business. Then, the interaction does not take place anymore in the final stage of exchange between firm and customer, the latter is involved from the very first moment.

4.2.1 Evidence from MyFirenze

MyFirenze is a project developed by the University of Florence with the collaboration of the Municipality of Florence in 2013, and then activated in 2014 for a few months. Particularly, it was conceived to enhance the travel experience in big cities of art where there is a number of must-see attractions but either the traveller is not totally aware of them or the timing scheduled is not perfectly set to take a look at them. This initiative tries to organize a customized itinerary in accordance with their preferences aiming at optimising the time of visit (D'Amico et al., 2013). The said plan is created at the visitor centre where the tourist reaches all the due information to become aware of the point of interests and trace a specific tour afterward that can be viewed through a personal device.

The interaction between the visitor and the technology occurs through a big display built close to the visitor centre of the city. The map of Florence, the background of the monitor, is special version of Google Maps because it underlines all the main point of interests of the city. Certainly, the map can be zoomed in and out, and for every POI (point of interest) is associated with an actable window in which images, brief descriptions and average time of visit are shown. After making the selection of venues to visit, the system is capable of calculating an approximate duration of the itinerary which can be spread over different days. Eventually the tourist has the same track on his own personal device due to a unique QR code generated in the end of the process. In this case, the user does not need to install any app from the app store since the URL associated is web based. Possibly, it is possible to update or modify the itinerary even after the QR code generation by adding/deleting points of interest.

Figure 4.3 Wall interactive display system



Source : D'Amico et al., 2013 p. 5

The entire procedure is based on an application server platform that provides several web services depending on the database accessed. There exist 4 main elements in the framework architecture for different purposes: the mapping layer in regard to the geographic data, user profiles layer associated to the personalisation of the user experience, contents layer containing all the description of the POIs, and recommendation engine which provides some suggestions on the basis of the preferences shown during the making of the itinerary.

5. Conclusions

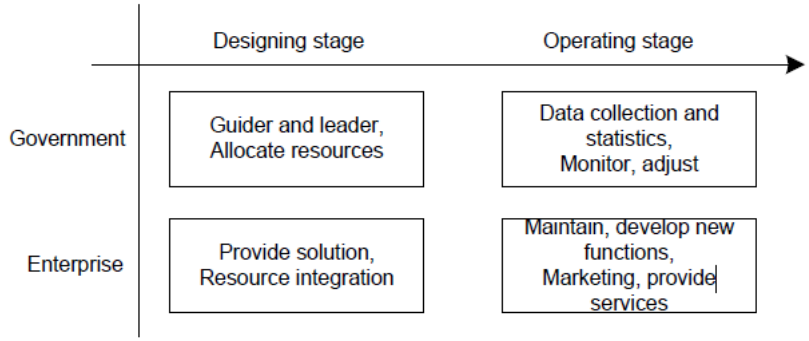
It is evident that Smart Tourism involves various actors and activities that need to be linked somehow. Ranging from a museum to a little bar close to it, the tourist should be informed about all the potential attractions around him. Clearly, the more the tourist platform increases its size including as much actors as possible, the more the experience provided is complete and heterogeneous, therefore, needless to say, a small sized initiative on Smart Tourism does not impact positively enough on the tourist experience. For instance, if TreSight and MyFirenze were developed on a district or quite narrow part of the city their positive benefit to the tourist would not be enough to justify both the bracelet and the wall interactive display. Consequently, as the dimension matters, the necessity of big funds and the difficulty of coordinating such a huge number of stakeholders could be seen as a deterrent in investing in Smart Tourism. Furthermore, the perspective of losses in the short-term and the uncertainty of profits in the long-term if the dimension is too little prevents private firms from taking an active part in the project in the early stage.

Hence, the government must assume a leading role in the first phases by guiding and allocating resources in an efficient and effective way in order to convince all the actors about the value of the project, and avoid technological barrier which may stop some low-innovative stakeholders from participating (Zhu, Zhang, Li, 2014). It is no coincidence both the projects described in the previous chapter are planned with an intense collaboration with the municipalities. Indeed, Smart Tourism involves several activities such as public transport, museums, tourist information points, cultural and urban data (e.g. Open Data Trentino) owned by public government. Moreover, it is easy to relate these initiatives to the promotion of the city brand, and the public institutions are exactly in charge of it.

Such a partnership between the public and private sector changes over time as suggested by Zhu, Zhang and Li in 2014 in “Challenges, Function Changing of Government and Enterprises in Chinese Smart Tourism” because of the evolution of functions and responsibilities. They spot two important phases, “designing phase” and “operating phase”, in which every actor has specific tasks to implement. The main concept is that government should represent a sort of guide at the beginning, and a controller afterward. It is fundamental in the early stages due to the necessity of huge funds, the coordination between many public and private activities, and the allocation of important resources among the various actors. In contrast, always during the first phase, private firms should use the given resources and design different solutions at the

same time. Then, in the "operating" phase, they have to implement those solutions by starting to provide services and trying to be scalable. While in contrast, the public institutions should pay a "controller" role by monitoring the overall situation and spotting some improvements over the system thanks to all the data gathered.

Figure 5.1 Function changing of government and enterprise participated in Smart Tourism



Source : Zhu, Zhang, Li, 2014

Certainly, even though the two actors play different roles during the two stages it does not mean they do not have to collaborate with each other. As stated in the introduction, the creation of an "ecosystem" (Boes, Buhalis, Inversini, 2015) is deeply necessary for the benefit of the entire system. The communication and the exchange of views is part of the holistic approach that needs to be undertaken in order to involve as much activities as possible. It has already been said in the third chapter about the linkage between Smart Cities and Smart Tourism, in particular how the positive effects on the residents can be translated into positive impact on the tourists themselves due to the fact most of the themes these phenomena are dealing with are exactly the same. In the recent years, all over the internet, in the context of building a smart city, online platforms have been thought as means of interaction between citizens and institutions. The single citizen got the opportunity to present his idea on something to change or enhance in the city. On the other hand, the municipality can fund the project if deemed useful or, as last resort, other members of the platform can have a say on it and take part eventually (see: as for Amsterdam www.amsterdamsmartcity.com , for Helsinki www.forumvirium.fi/en). The same structure could be used in Smart Tourism because it seems an interactive tool to take into account each stakeholder in the process. Actually, it is only needed to open a special section on the same platform for the proposals related to the tourist sector.

I started it off this thesis for the purpose of revitalizing an "old-fashioned" sector by proving that "smart" investments turn out to be very beneficial for a number of people on both sides, public and private one. I am completely aware that a member state of the G7 cannot be based

on a big but still seasonal sector as I perfectly know that it is barely possible to find a tourist firm looking at every ranking listed by Fortune et similar. However, I strongly believe that Italy can rank much better than 5th among the most visited countries internationally (UNWTO, 2016), therefore, making a special effort to be a ground-breaker into this field is not a waste of time. After all, innovating such a primary sector in our economy could represent a step forward into the main problem which Italy has been struggling with for the last two decades: productivity (Zingales, 2014).

Surely, the process towards the digitalisation is not a simple path, and most of the times the major obstacles are the people themselves with a close mindset. Indeed, chatting with one of the founders of MyFirenze, all of a sudden, the project was stopped due to a bad maintenance which caused the system not to be perfectly up-to-date[2].

[2] Total words excluding References: 11785.

References

Boes K., Buhalis D., Inversini A. (2015) *Conceptualising Smart Tourism Destination Dimensions*. In: Tussyadiah I., Inversini A. (eds) Information and Communication Technologies in Tourism 2015. Springer, Cham. DOI: 10.1007/978-3-319-14343-9_29.

Buhalis D., Amaranggana A. (2013) *Smart Tourism Destinations*. In: Xiang Z., Tussyadiah I. (eds) Information and Communication Technologies in Tourism 2014. Springer, Cham. DOI: 10.1007/978-3-319-03973-2_40

Buhalis D., Amaranggana A. (2015) *Smart Tourism Destinations Enhancing Tourism Experience Through Personalisation of Services*. In: Tussyadiah I., Inversini A. (eds) Information and Communication Technologies in Tourism 2015. Springer, Cham. DOI: 10.1007/978-3-319-14343-9_28

D'Amico G. et al., 2013. *A framework for Itinerary Personalization in Cultural Tourism of Smart Cities*. International Workshop on Intelligent User Interfaces, Turin, December 4, 2013. Media Integration and Communication Center (MICC) Florence, Italy.

Dearden L., 2014. *Londoners agree to give up first born child in exchange for free internet*. Article published on the 30th of September 2014 in The Indipendent. Available at http://www.independent.co.uk/life-style/gadgets-and-tech/news/londoners-agree-to-give-up-first-born-child-in-exchange-for-free-internet-9764291.html [Accessed on the 14th of June].

Disneyland. *My Disney experience*. Frequently Asked Questions. Available at https://disneyworld.disney.go.com/faq/my-disney-experience/frequency-technology/ Accessed on the 5th of July.

Ercole E., 2013. *Smart tourism e il ruolo dell'informazione social*. Novara, Annali del turismo, II, 2013 – Edizioni Geoprogress Onlus.

European Commission – *Digital Single Market*, Roaming Tariffs, 2017. Available at https://ec.europa.eu/digital-single-market/en/roaming-tariffs [Accessed on the 11th of June

2017].

Eupoean Parliament, 2014. *Mapping smart cities in the EU*. Directorate General for Internal Policies. Policy Department A: Economic and Scientific Policy. Available at http://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf [Accessed on the 31st of August 2017].

Eurostat – *Air passenger transport Monthly Statistics*, September 2016. Accessible at http://ec.europa.eu/eurostat/statistics-explained/index.php/Air_passenger_transport_-_monthly_statistics#Development_of_air_passenger_transport_at_EU_level [Accessed on the 11th of June 2017].

Gartner, 2016. *Gartner's 2016 Hype Cycle for Emerging Technologies Identifies Three Key Trends That Organizations Must Track to Gain Competitive Advantage*. Available at http://www.gartner.com/newsroom/id/3412017 [Accessed on the 28th of July 2017].

Google, 2014. "The 2014 Traveler's road to decision". Google Travel Study, June 2014, Ipsos MediaCT. Available at https://storage.googleapis.com/think/docs/2014-travelers-road-to-decision_research_studies.pdf [Accessed on the 4th of August 2017].

Gretzel U. et al., 2015. *Smart tourism: foundations and developments*. Electron Markets (2015) 25:179–188. DOI 10.1007/s12525-015-0196-8.

Gubbi J. et al., 2013. *Internet of Things (IoT): A Vision, Architectural Elements, and Future Directions*. Future Generation Computer Systems: Volume 29, Issue 7, September 2013, Pages 1645–1660. DOI: https://doi.org/10.1016/j.future.2013.01.010.

Haines G., 2017. *Airbnb boom is 'emptying' historic Italian cities*, The Telegraph. Available at http://www.telegraph.co.uk/travel/destinations/europe/italy/articles/airbnb-boom-is-emptying-italian-cities/ [Accessed on the 18th of June].

Hougland B., 2014. *"What is Internet of Things? and why should you care?"* Speech held on the 13th of September 2014 at TEDx Event in Temecula. Available at: https://www.youtube.com/watch?v=_AlcRoqS65E [Accessed on the 15th of June 2017].

iDEA Singapore, 2007. *Fact Sheet – Digital Concierge*. Infocomm Development Authority of Singapore (iDA) in partnership with Singapore Tourism Board (STB).

InterContinental Hotels Group., 2014. *Creating "moments of trust": the key to building successful brand relationships in the Kinship Economy*. s.l.: InterContinental Hotels Group.

La Rocca R. A., 2014. *The Role of Tourism in Planning the Smart City*. Tema. Journal of Land Use, Mobility and Environment, 7(3), 269-283. Doi: http://dx.doi.org/10.6092/1970-9870/2814.

McKinsey Global Institute, 2015. *Internet of Things: Mapping the value beyond the hype*, June 2015. Executive Summary.

Mulani T., Pingle S., 2016. *Internet of Things*. International Research Journal of Multidisciplinary Studies. Vol 2, Special Issue March 2016.

Pine B. J., Gilmore J. H., 1999. *The experience economy.* Harvard Business School Press. Boston, Massacchussets.

Prahalad C.K., Ramswamy V., 2004. *Co-creation experiences: the next practice in value creation.* Journal of Interactive Marketing vol. 18. DOI: 10.1002/dir.20015

Push H., 2016. Venice 'considering cap on tourist numbers' to stop overcrowding. The Telegraph. Available at http://www.telegraph.co.uk/travel/destinations/europe/italy/veneto/venice/articles/venice-considers-capping-tourist-numbers-to-stop-overcrowding/. [Accessed on the 5th of July]

Sun Y. et al, 2016. *Internet of things and Big Data analytics for smart and connected communities*. IEEE Access, special section on Smart Cities. DOI: 10.1109/ACCESS.2016.2529723.

Tanti A., Buhalis D., 2016. *Connectivity and consequences of being disconnected*. Springer International Publishing Switzerland 2016. Information and Communication Technologies in Tourism 2016, DOI: 10.1007/978-3-319-28231-2_3.

Travel and Tour World,2014. *Cities, Tourists and the Future of Europe's Tourism*. Available at: http://www.etoa.org/media/all-news/news-item/cities-tourists-and-the-future-of-europe-s-tourism [Accessed on the 10th of June 2017].

UNESCO, World Heritage Centre 2017. *World Heritage List*. Available at: http://whc.unesco.org/en/list/ [Accessed on the 10th of June 2017].

UNWTO, 2016. *Tourism Highlights, 2016 Edition*. Madrid, UNWTO Press and Communications.

Wachira K., Karthik P., 2016. *Smart Bus Shelters: Enhancing Public Information Systems in Bus Shelter by integrating Smart IoT solutions*. Malmö Högskola, Faculty of Technology & Society Department of Computer Science.

Weiser M., Gold R., 1999. *The origins of ubiquitous computing research at PARC in the late 1980s,* IBM Systems Journal, 1999.

World Urbanization Prospects 2014, 2014. United Nation, New York. Available at https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.Pdf [Accessed on the 10th of June 2017].

WTTC, 2017. *Travel and Tourism, Economic Impact 2017 Italy*. London, World Travel and Touris2m Council.

Zanella A., Vangelista L., 2014. *Internet of Things for Smart Cities*. IEEE Internet of Thing Journal, Vol I n° I, February 2014. DOI: 10.1109/JIOT.2014.2306328.

Zhu W. et al., 2014. *Challenges, Function Changing of Government and Enterprises in Chinese Smart Tourism*. ENTER 2014 Conference on Information and Communication Technologies in Tourism, Dublin, Ireland.

Zingales L., 2014. *Europa o No – Sogno da realizzare o incubo da uscire.* Prima edizione, Rizzoli.