

Cathedrals in the Digital Age: a Case Study of Santiago de Compostela and Canterbury

"I had rather go five times to Rome from England, than one time to Compostela: by water it is no pain, but by land it is the greatest [most impressive] journey that one Englishman may undergo".

Andrew Boorde, 16th Century, Pilgrim.

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Abstract

The main aim of this paper is to understand, in the age of 'Smart Cities' (Caragliu *et al* 2011), how Information and Communication Technologies (ICT) are used to manage and promote the cathedrals of Santiago de Compostela and Canterbury as key elements in their strategies to attract visitors and tourists to both places. We have analysed online visits, ICT service provision and the numbers of tourists at both venues since 2010, with the goal of exploring how technology is modifying the information available to tourists and management alike. The research is inspired by the words of an English pilgrim, cited above, who was travelling along the way to Santiago de Compostela some five hundred years ago. It was a time when communication was limited, travel by land and/or sea was the only form of communication between territories, and the only available method to establish economic and commercial relationships required cultural exchange and human mobility. In the early 21st century, one can fly from Santiago de Compostela (Spain) to London and then from London to Canterbury (UK) via high-speed train. Today, we speak of timetables, online bookings, emails, websites, smartphones and credit cards. This is the language of modern travel and acts as an example of our ICT requirements for such a journey. A visit to either city today highlights how the places and travellers have changed from the days of Boorde's pilgrimage. Just as important perhaps, despite such huge change, is that these two cities remain the destinations for vast numbers of pilgrims. Santiago de Compostela and Canterbury have several commonalities. Both located in western Europe, both historic cities are recognised as world heritage sites by UNESCO, both cities have magnificent Cathedrals that dominate the cityscape criss-crossed by pedestrian streets in their old town centres, both cities are the historical seats of the Church in their respective country, both cities act as cultural and religious destinations for pilgrims, and both cities have university campuses close to the city. Given the obvious similarities, it seems a very attractive proposition to compare both places in terms of tourism today. The research focuses on the two ancient Cathedrals. With centuries of tradition behind them, both 'attractions' have adapted management policies in keeping with the times. The digital age is here and a new era of 'smart cities' has arrived. A new episode in the history of Santiago de Compostela and Canterbury has emerged and needs further research.

Keywords: Santiago, Canterbury, cathedral, digital, tourism.

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1. Smart Cities and the Digital Age

All cities in Europe are involved in a transformation process as part of an “urbanising world” (Pacione, 2009; Townsend, 2013). According to the United Nations urban populations are continuing to grow rapidly around the world. More than a half of humankind is now living in cities and the United Nations estimates in 2012 that nearly 60% of global population will be living in urban areas by 2030, rising to 72-75% in 2050. This urban expansion will have its greatest impacts in India, China, United States, Indonesia, and Nigeria (UN, 2012). These countries also offer examples of where environmental risks are increasing rapidly and where urban pollution is conditioning the quality of life. Issues surrounding such growth has meant topics such as “sustainable growth” and “smart growth” are now well and truly on every international policy agenda. The European Union, going through its first major economic crisis of this century, recognises the importance of these concepts. The EU must try to reconcile issues surrounding growth, sustainability and environmental preservation for all its citizens.

The Europe 2020 Strategy³ offers one way to achieve this goal. Innovation and technology are the pillars for the European Union and “smart cities” is the concept used by many local, regional and national governments to highlight a path for a new age of cities (Hall, 1998; Asheim, 2006; Soete, 2011; McCann, 2013) in “which ICT is merged with traditional infrastructures, coordinated and integrated using new digital technologies” (Batty *et al* 2012).

Energy, Transport and ICT in urban areas are amongst the main issues for the European strategy for smart, sustainable and inclusive economies, especially in terms of competitiveness (Caragliu *et al* 2011) and growth (winters, 2010). The European Commission has recently launched initiatives for “Smart Cities and Communities”⁴ and the “Digital Agenda for Europe”⁵. These initiatives highlight the main indicators and targets for cities and ICT policies to 2020. Some research projects are funded in member states as flagship initiatives using ICT and several publications, conferences and meetings are now taking account of the “smart cities”⁶ agenda.

³ <http://ec.europa.eu/europe2020>

⁴ <http://ec.europa.eu/eip/smartcities/>

⁵ <http://ec.europa.eu/digital-agenda/>

⁶ www.smartcities.info

The next step in this “smart” movement - a regional analysis - is directly linked with the Smart Specialisation Strategies (RIS3 or S3)⁷ developed by the European Commission for the period 2014 to 2020, where smart cities and innovations are identified as the pillars for future economic growth and social development (Wintjes, 2010).

Alternatively, Giffinger *et al* (2007) have explored European medium-sized cities⁸, ranking cities based on regional competition. They have identified a range of characteristics for smart cities including: “smart economy”, “smart people”, “smart governance”, “smart mobility”, “smart environment” or “smart living” and most interestingly for this study they outlined a range of factors nested within the 6 characteristics including “touristic attractivity”. These characteristics and factors are similar to what Chourabi *et al* (2012) identified in their integrative framework to understand smart cities. Many of these characteristics and factors can be linked to Quality of Life (Shapiro, 2006), education and growth (winters, 2010).

Another component of the smart city is the private sector and those companies directly involved in the innovation of the relevant technologies. Firms such as IBM, Cisco, Siemens, Ericsson or Telefonica⁹ are involved in several “smart cities” projects and publishing studies and annual reports about this “smart time” where everything seems to be connected (Townsend, 2013) perhaps with a view to creating “smart-er cities” (Allwinkle & Cruikshank, 2011).

Smart City networks have been created around the world. In Spain the “Red de Ciudades Inteligentes” (RECI)¹⁰ was established in 2011 where Galician cities like Lugo, Santiago de Compostela or A Coruña developed digital agendas¹¹. All public services are included in this initiative financed by public funds FEDER (EU) and linked with the Digital Agenda for Europe, the Agenda Digital para España, and the Axenda Dixital de Galicia 2014¹². More generally the public sector and related institutions have begun to focus on “advanced and innovative services to citizens to improve overall Quality of Life” (Piro *et al* 2014) with some places now focusing on “sensing as a service model for smart cities” (Perera, 2014).

⁷ <http://s3platform.jrc.ec.europa.eu>

⁸ www.smart-cities.eu

⁹ www.ibm.com/smarterplanet, <http://labs.ericsson.com>, <http://smartcity-telefonica.com>

¹⁰ www.redciudadesinteligentes.es

¹¹ <http://smart.coruna.es/>

¹² www.agendadigital.gob.es, <https://imit.xunta.es/portal/>

To some extent we all take part in this smart movement where ICT, Internet, social networks and smartphones now condition the daily rhythm of life. On the other hand, there are critical voices who wish to ensure that all the technology associated with smart cities is put at the disposal of its inhabitants, and not the other way around (Sassen, 2011; Fernandez, 2014). So, are we smart citizens? Do smart cities need smart or intelligent citizens? Many have discussed the importance of human and social capital as well as productivity (Cariaglu *et al* 2011, Shapiro 2006), and their links to education and growth (Winters 2010). With this in mind it is not a great leap to consider the role of heritage in the smart cities debate and more particularly the ways in which ICT and related strategies may alter places like Santiago de Compostela and Canterbury in this era of the "smart city".

Access to ICT is linked to economic and social development (Lois-Gonzalez *et al* 2014). Comparative studies about this item have been elaborated from Galicia and other regions in the Atlantic Europe (Ferrás, 1994; Ferrás, 2005; Macía, 2007; Armas, 2009). This paper is a new step in a similar direction, i.e. a comparative study that looks at online visits, ICT services and provision and their uptake by tourism arrivals in both cities since 2010. Tourism in heritage cities and Information Society are the main aspects of this research, focusing on ICT and Internet evaluation as a process in tourism management (Choi, 2007; Buhalis, 2010), resource management (Perera, 2014) and local or regional development.

Therefore, this paper will explore ways in which the smart city concept is embraced by both cities and determine the extent to which ICT is modifying the shape of tourism information and management.

2. Santiago de Compostela and Canterbury: A Methodology to Compare Two Cathedral Cities

This paper was developed at the local scale, in the old town and the cathedral buildings and precincts of Santiago de Compostela and Canterbury. The largely qualitative research was conducted over a series of visits to both cities in 2013 and 2014. Background research was conducted in both cities to collect a range of quantitative and qualitative data and analyse different aspects of the 'smart city' and ICT use in each city and it was finally decided to focus on the magnificent Cathedrals in each city.

Following this decision a number of visits were organised to interview members of Cathedral staff at both locations. In addition, interviews took place with visitors to each city. This fact firmly places any findings regarding these cities and their usage of technologies into the context of “tourism in heritage cities”. This is significant because much of the literature on ‘smart cities’ seems to have focused on larger cities, e.g. Singapore (Mahizhnan, 1999) or those of intermediate size (Giffinger et al 2007).

We begin with some general observations about the two cities and the focus of their ICT use and then move into greater detail on each location. The first example explores the use of ICT in Santiago de Compostela’s in its attempts to resolve visitor concentrations in and around the Cathedral (Pazos and López, 2008; Santos, 2002; Santomil, 2012) with the expressed goal of improving security, controlling access and managing visitors. Another way in which ICT is being used directly is the Cathedral Foundation’s development of a web-based social campaign of “crowd funding” online to restore and maintain the building¹³, a concept directly linked to smart cities (Schuurman *et al* 2012).

Canterbury Cathedral seems to have a different focus from Santiago de Compostela whereby management and development of new ICT services to develop links with accommodation and catering establishments in the surrounding area being the priority. The main difference between Santiago de Compostela and Canterbury is the fact that an entrance fee is required to access Canterbury Cathedral and grounds, except for those entering to worship. The income derived from the entrance fee in Canterbury facilitates the maintenance of the buildings and is, to some extent, self-financing. Both cathedrals are involved in digital modernization processes that include website management as well as the placement of electronic equipment inside and outside the buildings. A range of digital activities have been instigated in both cities, such as: virtual tours online; downloadable audio guides; e-commerce initiatives; QR codes for smartphones, and sensors or sensing technologies focused to facilitate the accessibility of disabled people. All of these examples demonstrate how ICT can become firmly embedded into heritage cities to the extent that we might consider these places as “smart cities”.

¹³ <http://www.ayudaalacatedral.es>

In Canterbury the implementation of ICT in the management and promotion of the cathedral's website¹⁴ was analysed as well as data from electronic equipment inside and outside the building. Thirty five ICT indicators were reviewed with the staff of Cathedral House, including the website manager. Two intensive visits took place, one during a Service in the evening, the other with tourist groups in the morning. In Santiago de Compostela we met the staff of Cathedral Foundation¹⁵. Interviews and statistical analysis were conducted from 2010 to 2014, gathering data on the number of pilgrims, as well as museum and roof viewpoint visitors. Thirty five ICT indicators were also used in Santiago de Compostela so that comparative analysis with the Canterbury results could be undertaken. The numbers of visits were linked to the same indicators in both Cathedrals. Online visits and tourists were analysed in both buildings, in this first attempt to compare virtual and physical visitors.

The bulk of the research took place in Canterbury first and this informed some subsequent parts of the research, in particular asking about the suitability of charging an entrance fee to visit the Santiago's Cathedral. The economic situation and the building deterioration in Santiago necessitated the development of new methods to raise contributions towards the upkeep of the Cathedral and its activities. For example, the *crowd funding* campaign www.ayudaalacatedral.es was developed to collect donations and contributions online to restore the main façade. In addition the governmental budget has been increased trying to support the restoration. So, it was very interesting to compare both economic and management models with the goal of understanding differential opportunities and threats.

The first step in this work was to highlight a theoretical approach to the "*smart time*", ICT, tourism and the evolution of Information Society in Atlantic Europe, following other related studies (Macía, 2007; Armas, 2009; Santomil, 2012). All topics were related to the Digital Agenda for Europe and the 2020 Strategy for smart, sustainable and inclusive economies. Therefore, this research work might be considered an initiative that extends the research to make it possible to complete local and regional studies in both countries. In this case, the most magnificent and representative buildings in two historic cities were analyzed in terms of tourism and ICT resources.

¹⁴ www.canterbury-cathedral.org

¹⁵ <http://www.catedraldesantiago.es>

In the following sections of the paper website services and ICT equipment in both Cathedrals will be analysed. Thirty five indicators have been reviewed and compared in both cities. There are also qualitative and quantitative analyses of online information and visitor management over the past five years.

The first question to be explored in depth is to establish whether better website services or ICT equipment has an effect on the evolution of visitors and incomes in each Cathedral? To answer this question it was necessary to analyse the entrance fees and visitor numbers in both buildings. Incomes and visits since 2010 will be compared to evaluate the success or failure of each model. Firstly, the main difference is in the requirement for payment of a fee to enter Canterbury Cathedral, which should have a direct impact on income and visitor numbers. Secondly there will be a review and analysis of ICT services with the goal of comparing the impacts and outcomes of different approaches to management.

3. Websites and Ict Equipment

Thirty five ICT indicators were reviewed with the staff of both Cathedrals. We have analysed the 20 website services and 15 types of electronic equipment, with the goal being to establish how many of them are in use or involved in the process of implementation for tourists and visitors.

Figure 1: Website screenshots from Canterbury (left) and Santiago (right)



In general terms, since 2010 both religious institutions have developed several instruments to offer better website information and services. Websites are used to interact with visitors online in all languages (Figure 1). Social networks like Facebook, Twitter, Pinterest, etc. are available and virtual tours of the building, museum and library facilitate remote visitation and provide a first impression and visualisation of both Cathedrals before arrival.

Streaming services in real time, booking and shopping online, new *Apps* of Augmented Reality and Wearable Technology (Smart Glasses, Smart Watches, Smart Tracking, others) are the next wave in this ICT revolution named "The Internet of Things (IoT)¹⁶" (Perera, 2014; Fundación Telefónica, 2011; Fundación Bankinter, 2011) that will also require the modernization of the ancient buildings in both cities. Electronic equipment is also used for management, safety and access control.

For example, CCTV and various other sensors are monitoring the buildings 24 hours a day. QR Codes, audio guides and/or interactive screens can enhance the visitor experience and individualise their interpretation of the monuments.

Table 1: Comparison of Website Service available on www.catedraldesantiago.es and www.canterbury-cathedral.org

IND.	WEBSITE SERVICE	Santiago de Compostela			Canterbury		
		YES	NO	IMP	YES	NO	IMP
1	Electronic ID	X					X
2	Subscriptions	X			X		
3	Newsletter – mailing			X	X		
4	RSS		X		X		
5	SMS notifications		X			X	
6	Languages	X			X		
7	Sign language	X			X		
8	Social Networks (Facebook, twitter, etc..)	X			X		
9	Events Calendar	X			X		
10	E-booking	X				X	
11	E-brochures	X			X		
12	Virtual tour	X			X		
13	Mobile or tablet App available		X			X	
14	Electronic access to archive – library		X		X		
15	Electronic access to museum		X		X		
16	E-Commerce (souvenirs - shopping)		X		X		
17	Mailbox – suggestions	X			X		
18	Public Budget (annual report)		X		X		
19	Website Accessibility Program	X			X		
20	Events or services online (streaming)		X				X

¹⁶ <http://ec.europa.eu/digital-agenda/en/node/67432>

Table 1 highlights 20 web-based indicators of ICT usage by both Cathedrals. The website services are numbered from 1 to 20 and illustrate the differences between www.canterbury-cathedral.org and www.catedraldesantiago.es websites. An "X" in the YES or NO columns indicates whether a particular service is available or not an "X" in the IMP column means that particular service is in the process of implementation.

The main difference in service provision seems to involve online booking. In Santiago it is possible to get tickets online for entrance to the museum and guided tours. While, in Canterbury this service is not available and visitors can only purchase tickets in person at the Cathedral.

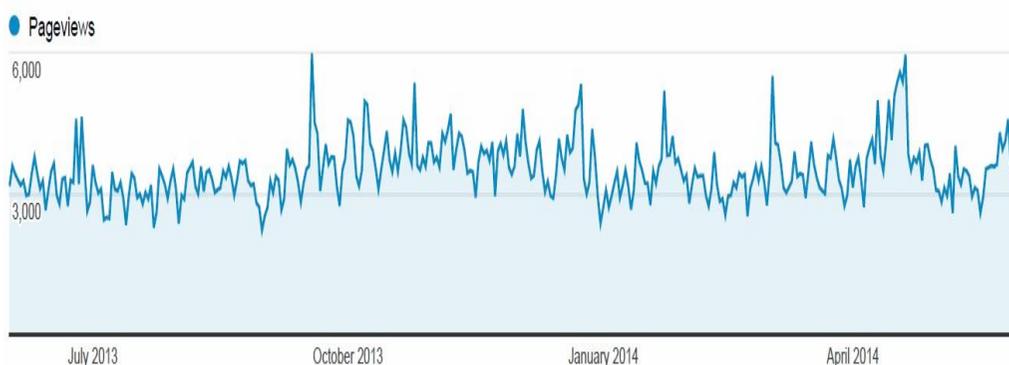
Conversely RSS and newsfeeds to subscribers is a service the Canterbury website offers that is absent from Santiago de Compostela website. While Canterbury has developed a good system of electronic access to the library, the museum and shopping for souvenirs online, Santiago does not provide these services. This suggests a greater co modification of religion in Canterbury (Olsen 2006), something also recognised in another recent study exploring visitor experiences at religious tourism sites (Bond *et al* 2014). Perhaps this explains why Canterbury's website provides access to published annual budgets and economic reports highlighting aspects of good governance. It would seem that Santiago de Compostela is somewhat behind Canterbury in relation to these aspects of public accounting and transparency.

All of these online services have been developed since 2010, with the goal of better information on the websites for visitors and tourists. To quantify the viability of Internet policies and investments in both Cathedrals it is necessary to measure the usage of both websites. The easiest way to do this is to explore the number of page views for each location. This indicator is representative of how many people access information, make bookings or just visit the website of each Cathedral before, during and after their visit, all of which have implications for each destination's image (Santomil, 2012).

All the information for Santiago comes from the period from 1st July to 31st December of 2013, i.e. the latter 6 months of 2013. In that 6 month period the website www.catedraldesantiago.es registered 113,986 visits and 308,706 page views.

There is no other information available about these online visits, so for Santiago it is not possible to directly link online visits to other aspects of tourism demand (e.g. no information on bookings, purchases, etc.). In Canterbury the website manager used the application Google Analytics and was able to provide a specific detailed report. For comparative purposes data was accessed for the same 6 month period as for Santiago, i.e. 1st July to 31st December 2013.

Figure 2: Page views example www.canterbury-cathedral.org.



Source: Google Analytics

Between those dates there were 220,100 online visits and the page views exceeded 500,000. Therefore, for the same period Canterbury Cathedral's website had approximately double the number of online visits compared to the Santiago website. For 2014, the website www.canterbury-cathedral.org registered 428,631 visits and 1,295,190 page views. Data for 2014 at www.catedraldesantiago.es was not available at this time. Figure 2 highlights the daily average of page views for Canterbury at approximately 3,000 to 6,000 views per day.

The analysis of electronic equipment (akin to hardware) explores 15 indicators in both Cathedrals, sees Table 2, and uses the same notation as in Table 1. In both cathedrals most of the equipment is either in place or in the process of being installed. The only differences between the two cathedrals are for Indicators 1 and 6. In Santiago the staff members have requested an Intranet to connect all their computers and provide hearing induction loops for visitors, while in Canterbury free software implementation is required to reduce the costs of this item.

Interactive screens for visitors are not available in either building. The main reason is linked to the places themselves and their functions as places of worship, which makes it impossible to find space for equipment that could be potentially intrusive equipment. Free WIFI is being implemented in both locations, the thinking being that this may open the door to faster broadband connections that might enable the use of new applications in the future.

The provision of WIFI for visitors under development has sparked serious debate, due mainly to the negative perceptions some people possess regarding the use of smartphones inside such buildings. The cost of WIFI technology in the building and the discussion about the use of

Table 2: Comparison of Electronic Equipment available Santiago de Compostela and Canterbury Cathedrals in 2014.

IND	ELECTRONIC EQUIPMENT	Santiago de Compostela			Canterbury		
		YES	NO	IMP	YES	NO	IMP
1	Intranet		X		X		
2	Computers with Internet	X			X		
3	QR codes for visitors	X			X		
4	Audioguides for visitors	X			X		
5	Interactive screen for visitors			X			X
6	Hearing induction loop for visitors			X	X		
7	Open WIFI – Wireless			X			X
8	Sensors (temperature, humidity, plagues,...)	X			X		
9	CCTV	X			X		
10	Control access (Cathedral)	X			X		
11	Other control access (museum, library.)	X			X		
12	Entrance payment with credit card - Museum	X			X		
13	Energy efficiency policy	X			X		
14	Call centre management (ACD)	X			X		
15	Free software implementation	X			X		

Mobile phones inside the Cathedrals have been the main obstacles to allow it. On the other hand, the possibility of augmented reality or QR codes is necessary to facilitate specific information. One of the things that online visitors valued positively are the virtual tour inside the Cathedral, where we found detail views of the building. Improved WIFI would actually negate the need for some of the more intrusive equipment as most visitors in the future will have devices that can access WIFI and receive information about the Cathedral in a rather less intrusive manner.

Figure 3: Screenshots of Virtual tours in Canterbury (left) and Santiago (right)



All of the website services and ICT equipment are designed to provide better information and management. In the following section the relationship between “smart” digital resources and tourism demand will be explored.

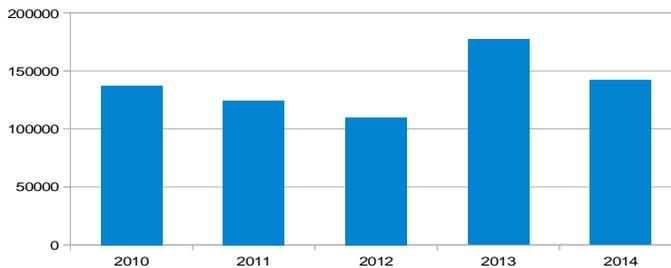
4. Tourism Demand and Management

The main difference between both Cathedrals is the visitor management and entrance policy. Santiago de Compostela offers free entrance to Church Building, while Canterbury charges £10.50 pounds for adults with discounts for children and groups. The entrance fee forms a key component of Canterbury's management strategy, with several consequences in terms of finance and maintenance. While Santiago does not charge for access to the Cathedral building it does charge to access the Museum, the rooftop viewpoint and the pilgrim's office.

In Santiago de Compostela adults have some choice and can pay for entrance to the Museum only (€6), guided tour + Museum (€10) and access to the roof viewpoint (€12), with reduced price for children and groups. Guided tours are also available (€10) and since 2013 includes the visit to the Museum. This addition of the guided tour to the museum option seems to be the main reason why visitors to the Museum have increased to 176,976, following three years of declining numbers from 2010 to 2012.

However In 2014, the numbers of visitors decreased by approximately 35.000 visitors from the previous year (Figure 4).

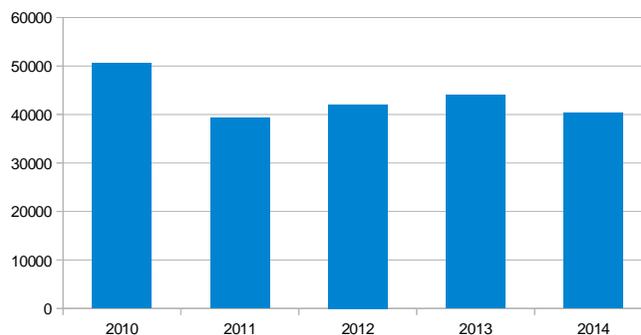
Figure 4: Numbers of Paid entrants to the Museum. Santiago de Compostela. Fundación Catedral de Santiago.



Given the decline prior to the addition of the guided tour component, and the renewed decline in the year immediately following this introduction one must wonder whether there is a decline in interest in guided tours, or alternatively might one identify an effect whereby the audio guides and self-information available for visitors on the website, has led to a decrease in people wishing to visit in person?

Audio guides in the Cathedral of Santiago de Compostela are free to download from the website www.catedraldesantiago.es and are available to use on smartphones. The cost of audio guide devices into the Cathedral costs €3.50. The download provides free information for visitors and self-guided tours, so in essence is in direct competition with the guided tours offered by professionals and audio guide devices rental. This tension between generating income and improving “smart” technologies is likely to be a central consideration in future management strategies.

Figure 5: Number of Paid Entrants to the Cathedral’s Rooftop Viewpoint. Santiago de Compostela. Fundación Catedral de Santiago

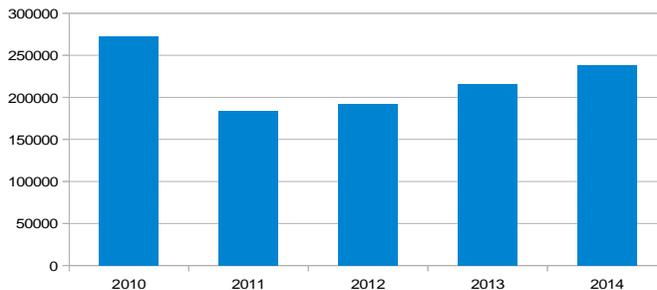


Entrance to the rooftop viewpoint in the Cathedral is another indicator of tourism demand in the building (Figure 5). The greatest number of visits at just about 50,000 took place in 2010 and this peak can be attributed to the fact that 2010 was a Holy Year with a large increase in numbers making pilgrimage to Santiago. Over the next four years the number of visitors has remained relatively constant at around 40,000 visits. Therefore, one could say there has been no growth in tourism demand to visit the rooftop viewpoints. Unlike the tensions surrounding the guided tours where digital technologies may be able to replace traditional activities this is not the case for the rooftop viewpoints. In 2014, in terms of overall visits to the Cathedral the number of payments to the Museum is approximately three times higher than the roof viewpoint.

The Cathedral Foundation has no system for controlling the number of visits entering the Cathedral. As there is no entrance fee, it is impossible to know precisely the total number of visitors, excluding the Museum and roof viewpoint where payment is required. However, The Foundation estimates near 3 million visits in 2014, based on the number of pilgrims with certification and accommodation demand in the city. Given that this is an estimate the total number could be higher when one considers that many visitors come for day visits only.

Pilgrims having their certificate officially stamped is the main indicator one can utilise to trace the evolution of visitors to the Cathedral and also the potential visitors to get inside the building (Figure 6). In Holy Year of 2010 the number of pilgrims with stamped certificates was 272,135. Over the next four years, the number of pilgrims increases progressively up to 237,886 in 2014. During this period, roughly 50% of pilgrims were Spaniards, 20% Europeans (Germany, Italy, Portugal, France, Ireland, UK, *inter alia*) and about 30% were from other parts of the world.

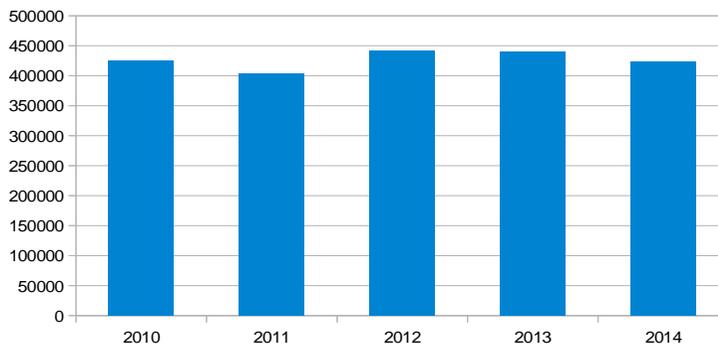
Figure 6: Total number of visitors receiving a stamp on their Pilgrim's Certificate. Santiago de Compostela. Pilgrim's Office - Fundación Catedral de Santiago.



In Canterbury the payment for entrance provides a different model of management compared to Santiago de Compostela. All visitors must come through the turnstile located at the Christ Church Gate where all paid entrants are counted by the Cathedral staff. During the hours of Service on Sunday mornings there is no access fee, but at all other times it is necessary to pay for entrance and visitors get access with reduced prices for families and groups.

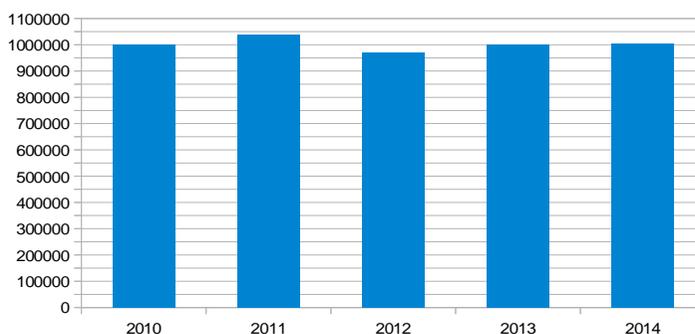
In addition to the entrance fee, guided tours cost £5, cheaper than Santiago de Compostela, and provided by a huge group of volunteers that help at the Cathedral. Audio guides are available on the web, however they cost £4 pounds each. Therefore the audio guides cost more in Canterbury than Santiago.

Figure 7: Paid entrants to the Cathedral. Canterbury Cathedral. Cathedral House.



Since 2010 the number of paid entrances has been fairly constant and in the region of just over 400,000 paid visitors (Figure 7). In 2014 there were 423,016 visitors. Similarly, the online visits to the website www.canterbury-cathedral.org numbered 428,631 in 2014, as we saw in the point 3 of this paper.

Figure 8: Total visits to the Cathedral. Canterbury Cathedral. Cathedral House.



The other indicator is related to total visitors, including paying and non-paying entrants. This group includes mainly locals: local students; local residents; people who work in Canterbury; or belong to a church in the Canterbury diocese and who all enjoy free entry.

It is estimated that on average 1 in every 2 visitors to the Cathedral gets access for free, excluding the when services are held where the entrance is always free. Since 2010 the overall number of visits sits at around 1 million. The foreign visitors came mainly from mainland Europe (45%) with France and Germany the main countries of origin. Approximately 15% came from the rest of the world, in particular from the United States, Japan, Australia and New Zealand. The remaining 40% of visitors are from the UK. As overall visitor numbers in 2014 are so similar to 2010 it would seem that better website information and the improvement of ICT equipment in the building since 2010 has had little impact on visitor numbers.

5. Conclusions

The analysis of the two cathedrals highlights show how both have embraced “smart technologies” as part of their approaches to the management of the visitor experience.

Despite the similarities evident in the analysis it is clear that the difference between the two Cathedrals, in terms of their approach to entrance fees, is of great importance to understanding other aspects of their strategies. Entrance fees in Canterbury provide more income for maintenance and human resources. Other services and income derived from them such as shopping for souvenirs online, audio guides, guided tours, and links to accommodation or catering supports the building and its activities.

Santiago de Compostela is starting the debate about self-financing, i.e. following the Canterbury approach, with a symbolic payment for entrance. Perhaps to avoid introducing a payment, a big effort has been made to restore the Cathedral by the Galician and Spanish Governments. The Foundation's planning in 2009 estimates it will cost €30 million to restore the building completely. In 2014 an agreement between the government and the Cathedral Foundation allows access to €14 million of public funds until the Holy Year 2021, but annual budgets would be necessary to cover operational costs.

An intense discussion is focused on this point and that an entrance fee may be a way to move towards a self-financing situation. Perhaps a reasonable solution would be to offer free entrance to the Cathedral during Mass and for other religious events and to introduce payment for entry at a symbolic price of €3 to €5 for visitors and tourist.

As in Canterbury, local residents, local students and people who work in the city should get free entrance. Perhaps, donations could be explored as an alternative to payments (Price 1994, Alpizar *et al* 2014) and the willingness to pay either could be assessed. All of this aside, some control access is necessary to establish accurately the number of visitors and the tourism carrying capacity of the Cathedral of Santiago de Compostela (Santos, 2002). The statistics from the Cathedral's website can play a vital role in adding to an understanding of these issues.

In terms of tourism demand, the numbers who pay for entry to Canterbury Cathedral is double the number of pilgrims who have their certificates stamped for free in Santiago de Compostela. The number of visits to the Cathedral of Santiago is higher than Canterbury, but the number of payments to the Museum is lower in Santiago and was decreasing in the last year.

Therefore, with the goal of achieving a sustainable policy for the future, it may be necessary to learn from Canterbury and introduce other strategies for the Cathedral of Santiago to fund itself. The need to generate income may lead to the introduction entrance fees, the offering accommodation or catering facilities or some other income streams in properties adjacent to the Cathedral. Transparency demands that annual budgets, income and expenditure and economic reports should be published on the websites – something Santiago must consider - so visitors might see the extent to which subsidies, donations and charges are used to fund the facilities of both Cathedrals.

The evidence suggests there is no direct link between better ICT services and visitor growth in either Cathedral. The most obvious benefit of digital developments is that they lead to better information for visitors and a positive image and web presence that can be viewed around the world. Websites characteristics and indicators of electronic equipment utilisation are in the process of development and conditioned by the economic resources in both religious institutions, mainly in Santiago de Compostela. Relatively speaking, the fact that Canterbury introduced an entrance fee in the late 1990s might explain its more advanced position. While the “smart city” concept has been with us for some time, it is only in the past decade that the technologies have become widespread enough to have a real impact. Therefore, “smart cities” as real places are in an early stage of development and many aspects of the digital age are in their infancy.

This is particularly true in the Cathedral cities of Santiago de Compostela and Canterbury, and all places with historic attractions more generally. Over the coming year's cities, institutions, organisations and attractions will need to adapt their infrastructures for the digital age, in all likelihood requiring greater levels of funding. Cities must make this transformation to remain competitive (Shapiro 2006; Giffinger et al 2007; Caragliu 2011; Chourabi 2012). This transformation has begun and is likely to have impacts on all aspects of our urban environments. In this context, we must ask ourselves what role is there for heritage cities in this era of “smart cities”. Will historic cities be viewed like museums or galleries or as places to live, work and enjoy? What role do heritage cities play, and what knowledge can they provide about urban growth and technological advances? This research suggests that ICT has the potential to revolutionise the tourist experience of place and thus cities more generally.

"It is the need to design a system that puts all that technology truly at the service of the inhabitants—and not the other way around"

Saskia Sassen, 21st Century, sociologist.

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¹⁷ <http://www.catedraldesantiago.es>

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