

SMART TOURISM TECHNOLOGIES AND SUSTAINABLE TOURISM DEVELOPMENT: EVIDENCE FROM BRAȘOV COUNTY

CODRUȚA ADINA BĂLTESCU

ASSOCIATE PROFESSOR PHD, FACULTY OF ECONOMIC SCIENCES AND BUSINESS
ADMINISTRATION, TRANSILVANIA UNIVERSITY OF BRAȘOV,
e-mail:codruta.baltescu@unitbv.ro

Abstract

The widespread use of smart tourism technologies is a constant habit for modern visitors. Consequently, continuous adaptation and improvement of communication systems from the tourism industry is a prerequisite for both performance and competitiveness, but also an important step for sustainable tourism development. The newly smart technologies generated numerous and also outstanding changes which contribute to everyday life improvement. As for the tourism destinations' development, the smart technologies are able to change completely the direction of communication with visitors and to provide interesting and complete tourism experiences. The article examines the content of smart applications implemented at the tourism destination Brașov County and their involvement in ensuring sustainable tourism development. The findings demonstrate the relevance of smart tourism technologies for the destination management and, at the same time, their role in improving the sustainable tourism development actions. Their role in perfecting socio-economic goals and their involvement in improving tourism consumption are major fundamentals for improving the tourism sector as a key contributor in cities' evolutions. The results presented in the article highlight the huge potential of introducing smart technologies in order to be competitive and to perform the sustainable issues, and also the existing gap between smart tourism development in Brașov County in comparison to other regions from our country and internationally.

Keywords: Smart tourism technologies, sustainable tourism development, tourism destination, Brașov County,

Clasificare JEL: M1, Z30, Z32

1. Introduction

Nowadays the search for online information and reviews is a "must" for the modern tourist. Tourists search for information that helps them make better decisions when it comes to choosing a holiday destination, and they do so using different channels [8]. Tourism websites are becoming more and more popular, but at the same time the need for rapid information has generated the development of new technologies that have changed the direction of search. In traditional Internet searches, the tourist uses the search engines to get the desired information. Within the newly smart tourism applications, the tourist logs into a specially created system and gets a complete flow of information when located in an area of tourist interest, near a tourist attraction, etc. General understanding of how technology changes our society and economy and the tourism sector in particular, has shifted from a marketing-driven tool to a knowledge creation tool [17].

The "digitization" era (1997-2006) was marked by the development and maturity of the Internet as a commercial tool and was followed by "the age of acceleration" era (2007-2016) which was marked by technologies such as Wi-Fi, search engines, Web 2.0, tablet, the smartphone, wearable computers, sensors, Internet of Things, crowdsourcing, open source, drones, and the emergence of machine learning and artificial intelligence, etc. [17]. The existing information technology has the capability to handle and support vast troves of data and opens the door to numerous opportunities to integrate platforms to handle complex data with the final target of taking better business decisions [15].

Numerous previous studies have shown that the information sources have an influence on the intentions tourists have of visiting a particular destination [6], and it is the first step before planning a trip and making decisions [1]. Also, the use of the official Web site of the destination and comments of friends and relatives have a positive and direct influence on the loyalty development [1].

Smart systems have been introduced to many areas, including energy-saving, water supply, public safety, health services, public education, infrastructure construction and environmental protection, aiming for economic growth, sustainable development, and societal progress. Smart tourism is a concept which highlights the natural progression of e-technologies in tourism. Traditional one-way communication tools such as advertisements, brochures, or road shows are replaced with smart technologies such as interaction with tourists via websites, social media, mobile apps, etc. The rising popularity of smartphones and tablets contributes to the development and diffusion of apps, consumers showing a preference for mobile apps versus mobile websites [5]. Moreover, 3D documentation and virtual exhibition is now a new and effective way to preserve and exploit ancient building and culture and other major tourist attractions [9].

The concept of smart tourism is defined as an ICT-integrated tourism platform, which integrates tourism sources and ICT, such as artificial intelligence, cloud computing and internet of things (IoT), to provide explicit information and satisfactory services to tourists based on the development of innovative mobile communication technology [18]. Smart tourism-related research has been conducted in a number of areas, such as [16]:

- (1) smart tourism and smart city, which describes the application of the “smart city” concept and technologies into a tourism context;
- (2) smart tourism destinations;
- (3) smartphone applications on tourism, which focus on the functionalities and adoption of smartphone apps;
- (4) smart hotels, which examines the utilization of information technology in the hotel sector and the digital marketing resolutions of smart hotels;
- (5) smart cards that could be utilized in the tourism industry;
- (6) gamification, augmented reality and smart tourism, which describes the determinants of recommendations to use augmented reality technologies;
- (7) smart recommendations for tourists, which investigates personalized destination recommendation system combining individual preference and GIS data, and
- (8) smart guides, which describes context-based information implementation in smart tourist guide.

Smart tourism technologies have changed tourists' behavior and have generated a specific segment of visitors which are considered as "new" tourists. The key tourist demands in the information era include [16]:

- (1) pursuing personal travelling preferences and schedules;
- (2) value for time and less willingness to wait or put up with delays;
- (3) searching for travel-related information through the Internet;
- (4) booking online tickets and making room reservations;
- (5) making online purchases;
- (6) conducting price comparisons on different travel websites;
- (7) communicating in the virtual travel communities;
- (8) offering an ecomplaint handling systems;
- (9) asking for multimedia service;
- (10) providing mobile facilities and applications such as Wifi, shortmessaging service and multimedia-messaging service.

Smart tourism is considered customer-centered aiming to fully satisfy the tourists' needs for food, accommodation, travel, shopping and entertainment. It is a new pattern of tourism operation whose fundamental task is to create more value for tourists, travel agencies, scenic spots, hotels, government departments and other travel participants [11]. It is also important to notice that smart technologies favour competitiveness and also sustainable development at tourist destinations [14].

The paper evaluates the main smart technologies implemented in the tourism sector from Braşov County. Well-known hotels, tourist attractions, and Braşov local authorities were analyzed through their smart applications in use. The results emphasize that there is room for further

developments and that these technologies also play an important role in achieving sustainable development.

2. Smart City initiatives and their relationship with tourism development in Romania and internationally

Sustainable development of urban areas represents a major goal in the European Union strategies. In 2011 the Smart Cities and Communities Initiative was launched and was followed by the European Innovation Partnership for Smart Cities and Communities. Technologies (ICT), energy management and transport management are key issues in implementing innovative solutions to the major environmental, societal and health challenges facing European cities today.

A Romanian association was created, i.e. the Romanian Association for Smart City and Mobility (ARSCM), being the authority of the Smart City Industry in Romania. Its main objective is the development of the creative-intelligent communities in the country. The Association is the organizer of the Smart City Caravan program, the only program to promote smart city solutions and educate decision-makers on new technologies, which runs for 12 months, in 12 regions of Romania, a program developed under the high patronage of the Romanian Ministry of Energy.

More than 25% of Romanians live in a city that has at least one Smart City project in progress or already completed. Moreover, 38 large, medium and small cities in the country have more than 200 Smart City projects underway, or already completed [19].

The city of Alba-Iulia will become, at the end of 2018, the first smart city in Romania. Through many partnership projects that have been carried out, the city benefits of high-quality, secure and free WiFi which is provided in the city's interest areas - railway station, bus station, Alba Carolina Fortress; buses equipped with free WiFi security and air quality monitoring sensors (anyone can check the parameters on uradmonitor.com/alba), a captivating portal specially created for the Internet on buses, a platform called City Analytics, which offer data on urban, traffic, people coming and going out of Alba Iulia, smart lighting poles which can reduce the current consumption by almost 50%, etc.

Numerous smart tourism applications were also implemented. Among these, the most significant are:

- a mobile application, e-AlbaIulia, a virtual guide to the city's sights, events and restaurants,
- e-AlbaIulia application uses beacon technology - devices that transmit information on the phone when the user is within range.

- an official travel blog, www.vizitezaalbaiulia.ro, the first of the same in Romania, promoted on the Facebook page of Alba Iulia, which addresses both tourists visiting the city and those who intend to plan a visit, the blog being especially designed to communicate with young social networking enthusiasts,

- a "welcome" package with a new tourism promotion tool - QR code (Quick Response) pads which present to the Romanian and foreign visitors 64 cultural and tourist objectives. Each attraction is marked with a tourist plaque, located in a visible place and at a height that allows scanning the QR code with the smartphone,

- a virtual tour of Alba Carolina Citadel,

- apps for restaurants, mainly for booking and menus information.

Alba Iulia Smart City will use smart technology and data in addressing present and future city challenges related to resilience, sustainability, social and economic development, energy and environmental issues, the solutions being developed by the private sector with administration support.

The results which were obtained are notable. Alba Iulia is the only city in Romania that has received more than 50 million euros from the EU to capitalize on a historic landmark, Alba Carolina Citadel, the city's brand. Alba Iulia is also the first Romanian city to have a professional brand. The logo consists of four elements, the star symbol of the city, the name of the city in large letters, the slogan at the top ("the other capital"), and the tourist promise at the bottom under the name of the city ("welcome to the largest citadel in Romania").

Cluj-Napoca is another example of a Romanian city that uses digital technologies for tourist promotion activities. In this respect, a complete mobile application service, called Zoniz, has been implemented. Beacon technology is also used, which conveys relevant information by location and helps to increase accessibility, attractiveness and tourist diversity in the city. The beacon-based touring platform has the advantage of being a sustainable system that can be developed in the future to include ways to reach the airport, museum-guided tours, one-click check-in for hotels or city events. By installing the Zoniz application, tourists discover the tourist value in a novel way, participating in a digital treasure hunt with guaranteed prizes and accessing various vouchers of discounts offered by local brands. The application provides information about historical monuments in Cluj according to where the user is located, and supports the growing awareness of the brands involved in the project [21].

Mobile applications in tourism are varied and international examples are numerous. Divya (2016) analyzes smartphone uses in travel plans and habits. California Travel Guide WithMe, Visit Portugal Travel Guide, Tourism Thailand, and Vist Dubai are among the best developed mobile travel apps. The main features of these tourism resources consist of detailed information about places, events, food, road rules, availability in foreign languages, availability both online and offline, and provide holiday suggestions [7].

At international level a ranking of smart cities in 2017 suggests that New York is considered the world's "smartest" city, London takes the second spot, followed by Paris, Boston, San Francisco, Washington D.C., Seoul, Tokyo, Berlin, while the 10th spot in this hierarchy is taken by another European city, i.e. Amsterdam [22].

Recent relevant research on smart applications in the tourism sector highlight Dubai's evolution in this respect. The Government and other stakeholders in the Dubai context have recognized the strategic importance of tourism and its contribution to the economy while identifying it as a major economic sector along with trading, real estate and retail, among others [10]. The project known as Smart Dubai has been the foundation in applying smart technologies for building a city of the future. Within this project the tourism mobile applications include major infrastructural components such as airport, hotels, transportation, with the final goal to offer specific tourism products and services that deliver value and increase tourists' and residents' happiness. The main mobile applications are [10]:

- iDubai - the official app for Dubai Municipality which includes a map that lists every point of interest such as offices, clinics, banks, hospitals, mosques, schools, malls and pharmacies with an accurate location;
- RTA Dubai - provides road and transportation information about metro station, bus, and even taxi;
- Dubai Calendar - is the official listing of all events in Dubai about conferences, concerts, exhibitions, festivals, etc.;
- Time Out Dubai – a popular lifestyle magazine, application providing information about the best options for a good night out, music, restaurants, films, and hotels;
- mParking Dubai – which enables an easier payment to parking machines only by a SMS; Dubai Metro – with plenty of information about Dubai Metro;
- Dubai Mall – an application enabling the navigation around malls using GPS and a 3D map, with a wide categorization of shops, restaurants, and coffee shops.

According to Khan et al. (2017) Dubai currently implements new technology and is considered one of the most competitive tourism destinations in the world. Tourists in Dubai can explore key solutions including where to go and what to do using NFC (Near Field Communication) tags that are integrated with tourists' individual devices. A new initiative by the Dubai Government allows travelers to use their smartphones also as a passport for immigration [10].

3. Smart technologies applied in the tourism sector from Braşov County

Braşov County is one of the most representative tourism destinations in Romania. This statement is supported by the number of travelers who visit each year the destination and also by the variety of tourist attractions. Table 1 highlights the number of tourists accommodated in the Braşov County establishments during 2017 and also the overnight stays recorded in the period.

Table no. 1 Arrivals of tourists accommodated and staying overnights in the establishments of tourists' reception with functions of tourists' accommodation, by type of establishments, in 2017, in Braşov County

Type of establishments	Number of arrivals	Number of tourist overnight stays
Total	1260742	2531053
Hotels	765051	1533026
Apartment hotels	1575	2943
Motels	25396	41247
Hostels	32682	57201
Tourist villas	64313	132399
Bungalows	2521	7266
Tourist chalets	28919	48031
Holiday villages	1473	2592
Camping sites	2679	2908
School and pre-scool camps	348	900
Tourist boarding houses	170863	350202
Agro-tourist boarding houses	164353	351539
Houselet-type units	569	799

Source: INSSE, tempo-online, available at:

<http://statistici.insse.ro/shop/index.jsp?page=tempo2&lang=ro&context=63> (Accessed 22 may 2018)

Taking into account the fact that the total number of arrivals of tourists accommodated in the Romanian tourism establishments in 2017 was of 12143346 persons, Braşov County records 10,4% out of this relevant tourist indicator. At the same time, Braşov County offers tourists a wide range of accommodation possibilities, as shown in table no. 2.

Among the most important hotel units in Braşov county, the author selected on the basis of their size and reputation several accommodation units, namely Aro-Palace Hotel, Alpin Hotel, Kronwell Hotel and Ramada Hotel in Braşov and Club Vila Bran from Bran. In this respect, the websites of these units were consulted and the results show that smart technologies are limited to online bookings and social-media presence. In addition, the Alpin Hotel uses the virtual tour to fill in guests' information about hotel's offer.

Websites of important tourist attractions were further analyzed, namely the Black Church and the Bran Castle. The Black Church online presence is very simple, basic information being offered to prospective visitors [23]. As for the Bran Castle, there are more advanced technologies in use, such as the possibility to book and purchase e-tickets, social media presence, online guests registration which could fulfill information about segments of customers and also a virtual tour [20].

To enhance the city's tourist experience, smart technologies allow users to download urban exploration tours directly from phone. Such tours promote tourist attractions of interest, completing the information provided to the visitor with elements of local gastronomy, stories, customs or traditions.

Table no. 2 Establishments of tourists' reception with functions of tourists' accommodation and the tourists' accommodation capacity, by type of establishments, in 2017, in Braşov County

Type of establishments	Number	Existing accommodation
------------------------	--------	------------------------

		capacity (number of beds)
Total	955	29811
Hotels	124	11542
Apartment hotels	2	52
Motels	9	632
Hostels	29	1392
Tourist villas	79	1787
Bungalows	5	118
Tourist chalets	34	1171
Holiday villages	2	120
Camping sites	1	352
School and pre-school camps	1	50
Tourist boarding houses	255	5456
Agro-tourist boarding houses	411	6965
Houselet-type units	3	174

Source: INSSE, tempo-online, available at:

<http://statistici.insse.ro/shop/index.jsp?page=tempo2&lang=ro&context=63> (Accessed 22 may 2018)

Questo is a city exploration application, and the list of Romanian cities that can be explored following this application is also Braşov, alongside with other Romanian destinations: Alba-Iulia, Bucureşti, Sibiu, Cluj-Napoca, Timişoara, Iaşi, Craiova, Sighişoara and Cisnădioara. Questo can be downloaded free of charge from the Google Play and App Store stores. After downloading the application and choosing the desired route, users get a starting point in the city. Once they get there, they get a first clue they have to solve to find the next point along the route along with their story. Then there is a new clue and the process is repeated until the end.

A Questo tour comprises 7 to 15 places in the city stretched for a maximum of 4 kilometers and the average exploration time is 2 hours. In order to ensure high quality tours, Questo collaborates with all local stakeholders interested in promoting the city: guides, museographers, teachers, researchers, local people, and NGOs [24].

Finally, the results of developing the city of Braşov into a smart city and the effects on tourism development were analyzed. E-public transport, smart lighting, Wi-Fi networks and sustainable development are amongst the main achievements, but local tourism smart technologies actions were not yet applied [13].

The participation in the overall process aiming to improve tourism consumption, to refine the activities of tourism companies directly involved in the tourist offer and also local stakeholders, to enhance local awareness regarding the developmental valences granted to the city through the evolution of the tourism sector are just a few arguments that highlight the contribution of smart technologies applied in tourism to sustainable development.

4. Conclusions

Sustainable tourism development decisions are defining for the management of the tourism sector, as more and more consumers of tourist services appreciate tourism-environment relationship and creativity in preserving the environment as important issues for their holiday plans [12]. Also, the services offer is influenced by the manner in which the users know that these services are performed at a high degree of performance and according to the ethical demands associated to these services [2]. The complexity and dynamics that characterize the information area, requires a rigorous approach to collecting, inventorying, evaluation and analysis [3]. The success of all this steps depends, to a large extent, on the actions of competent employees, as well as the development of strong tourism departments both at the level of local authorities and the companies involved in the development of tourism sector [4].

The elements presented in the paper point out that there is a vast potential for the Braşov County tourist offer to encourage smart technologies implementation. The national experience, represented especially by Alba Iulia's achievements, and multiple examples from international practice support the necessity to encourage this inevitable trend in tourism development. One thing is certain. The future of tourism is based on technological development and its rapid and extensive implementation at all tourism sector's levels.

5. Bibliography

- [1] **Almeida-Santana, A. and Moreno-Gil, S.**, *New trends in information search and their influence on destination loyalty: Digital destinations and relationship marketing*. Journal of Destination Marketing & Management, 6, 2017, pp. 150-161;
- [2] **Anton, C.E.**, *Considerations on the contract relations between the financial –accounting services compnies of Romania and their clients*. INTED2010- International Technology, Education and Development Conference 2010, 8th-10th of March, 2010, Valencia, Spain, p. 1188;
- [3] **Bălăşescu, S.**, *Scientific Research in Romanian Trade*. Annals of the "Constantin Brâncuși" University of Târgu Jiu, Economy Series, Special Issue Eco-TREND 2015 - Performance, Competitiveness , Creativity, pp. 193-197;
- [4] **Bărbulescu, O.**, *Adapting the wine producers' offers in Muntenia Oltenia to the new market trends*. Bulletin of the Transilvania University of Braşov, Series V: Economic Sciences, Vol. 10(59) No. 2, 2017, pp. 243-250.
- [5] **Chen, M.-M., Murphy, H.C. and Knecht, S.**, *An Importance Performance Analysis of smartphone applications for hotel chain*. Journal of Hospitality and Tourism Management, 29, 2016, pp. 69-79;
- [6] **Dey, B. and Sarma, M. K.**, *Information source usage among motive-based segments of travelers to newly emerging tourist destinations*. Tourism Management, 31(3), 2010, pp. 341–344;
- [7] **Divya, K.**, *Study and reviews of smart city based tourism mobile app*. International Journal of Computer Trend and Technology (IJCTT), 35(5), 2016, pp. 226-230;
- [8] **Ho, C., Lin, M., and Chen, H.**, *Web users' behavioural patterns of tourism information search: From online to offline*. Tourism Management, 33(6), 2012, pp. 1468–1482;
- [9] **Hua, L., Chen, C., Fang, H. and Wang, X.**, *3D documentation on Chinese Hakka Tulou and Internet-based virtual experience for cultural tourism: A case study of Yongding County*, Journal of Cultural Heritage, 2017, <http://dx.doi.org/10.1016/j.culher.2017.08.008>;
- [10] **Khan, M.S., Woo, M., Nam, K. and Chathoth, P.K.**, *Smart City and Smart Tourism: A Case of Dubai*. Sustainability, 9, 2017, pp. 2279-2302;
- [11] **Li, Y., Hu, C., Huang, C. and Duan, L.**, *The concept of smart tourism in the context of tourism information services*. Tourism Management, 58, 2017, pp. 293-300;
- [12] **Lim, W.M.**, *Creativity and sustainability in hospitality and tourism*. Tourism Management Perspectives, 18, 2016, pp.161-167;
- [13] **Primăria Municipiului Braşov**, *Smart City Braşov. Braşovul pe harta Smart Cities. De la viziune la realitate*, 2017. Available online at: <http://romaniasmartcities.ro/wp-content/uploads/2017/10/3.Primaria-Brasov-Gabriela-VLAD-ICT-Manager-%E2%80%9CBraşovul-pe-harta-Smart-Cities.-De-la-viziune-la-realitate%E2%80%9D.pdf>, (Accessed 29 March 2018);
- [14] **Santtu, K.**, *Smart Tourism: Achieving Sustainable Development*, 2017, Available online: <https://jyx.jyu.fi/dspace/bitstream/handle/123456789/54122/URN%3aNBN%3afi%3ajyu-201705262508.pdf?sequence=1> (Accessed 15 March 2018);
- [15] **Vajirakachorn, T. and Chongwatpol, J.**, *Application of business intelligence in the tourism industry: A case study of a local food festival in Thailand*. Tourism Management Perspectives, 23, 2017, pp. 75-86;

- [16] **Wang, X., Li, X., Zhen, F. and Zhang, J.,** *How smart is a tourist attraction?: Measuring tourist preferences of smart tourist attractions via a FCEM – AHP and IPA approach.* Tourism Management, 54, 2016, pp. 309-320;
- [17] **Xiang, Z.,** *From digitization to the age of acceleration: On information technology and tourism.* Tourism Management Perspectives, 25, 2018, pp. 147-150.
- [18] **Zhang, L., Li, N. and Liu, M.,** *On the basic concept of smarter tourism and its theoretical system.* Tourism Tribune, 27(5), 2012, pp. 66-73.
- [19] ***www.capital.ro;
- [20] ***www.castelulbran.ro;
- [21] ***www.discovercluj.zoniz.com;
- [22] ***www.forbes.com;
- [23] ***www.honterusgemeinde.ro;
- [24] ***www.start-up.ro