INFORMATION TECHNOLOGY – A TOOL TO REDEFINE THE AIR TRAVEL ESSENTIALS

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Abstract:
In an era where technology changes people's way of living, the companies in the tourism industry are struggling to exist and cope with a continuously increasing demand from a new and more sophisticated tourist. As aviation has always been the leading field in technological innovation, changing tourism and the whole society in a significant way, a particular attention was given to the way airports respond to these new challenges. This paper highlights the way technology shaped the new typology of tourists, focusing on the way passenger service is being reinvented in airports. The analysis concentrates on 2 aspects: the actual problems encountered by airports nowadays and the changes occurred in the behavior of the modern passenger.

Key words: information technology, travel, airport, biometrics, geo-location, mobile, bluetooth, internet, passenger.

JEL Classification: L93.

INTRODUCTION

Over the past years, as technology kept evolving at a high pace, all sectors have been confronted to new opportunities and challenges. Technology determined the evolution of the whole society, changing people's ways of living and habits, creating new trends and new consumer typologies. Travel and Tourism is one of the sectors which developed as technolgy evolved, benefiting from it and influencing its evolution in the same time. The airline industry is the most dynamic component of the travel and tourism industry, and the pioneer of the technological developments in the field.

Airports represent a key point in the travel and tourism industry as they represent the connection between airlines, consumers and destinations. More

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and more specialists refer to the airpors of the future as "airport cities", beginning to have the caracteristics and the functions of an independent city. Airports have evolved significantly during the last 30 years and all these changes have been directly connected with the evolution of technology. The purpose of this study is to reveal how technology is the key element in the evolution of airports. An analysis is conducted in order to explain the challenges of the system in order to understand how technology could help airports provide better passenger service.

SHORT HISTORY OF ICT EVOLUTION AND ITS IMPACT ON THE TRAVEL AND TOURISM INDUSTRY

Travel and tourism have always been closely connected with the information and communication technologies (ICT) sector, benefiting from the technological developments and, in the same time, contributing to its evolution. Due to the new technological developments, enterprises and destinations needed to adjust to the new trends and to a new consumer typology, adopting innovative approaches. The modern consumer is more familiar with IT technologies, he has access to information which made him more sophisticated and demanding, requiring specialised and interactive services. The evolution of ICT shaped and re-engineered the travel and tourism industry[1]. The tourism industry is highly fragmented and diverse, linking a „worldwide supplier community"[2] with consumers also distributed globally, bringing together different cultures, regions at different development stages, each with enterprises of different sizes. The evolution of ICTs demonstrated that centralizing data is a key element in the development of tourism as well as transforming distribution into an electronic marketplace[3].

The pioneers of the technical developments in the tourism industry were the Computer Reservation Systems (CRS) in the 1970s and the Global Distribution Systems (GDS) in the 1980, among the first multi-organisational and global information systems[4], followed by the Internet in the 1990.

Starting the 1990s, "world wide web" (WWW) became the primary mean of information distribution, redefining the society, the habits and consumer profiles. The first step associated to the development of the "world wide web"

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[1] Buhalis Dimitrios, *Strategic use of information technologies in the tourism industry*, p.3

[2] Werthner H, Klein S, *ICT and the changing landscape of global tourism distribution,* Electronic Markets, Volume 9, Issue 4, 1999

[3] Buhalis Dimitrios, *Strategic use of information technologies in the tourism industry*, p.6

[4] Abel Usoro, *ICT (Information and Communications Technologies) and Tourism: An Initial Exploratory Study of Developing Economies as Suppliers of Hospitality and Destination*, p. 1

was "web 1.0", characterized by connecting information, as a collection of static sites that the users can access. At this stage, the consumer gained access to information, enterprises started to have visibility, but there was no interaction between them, the consumer having a passive role. "Web 2.0", also called the social or community web[5], had a significant impact on the society and on the existing business models. Its main characteristic is being people centric, linking users and allowing them to be a part of the creation process. Web 2.0 represented the beginning of social networks, virtual groups, dynamic content and personalized services, explaining why it had a strong influence on the consumers profile and on business models[6].

The consumer becomes an active participant, sharing experiences, pictures, preferences, allowing enterprises to better understand their public and its needs and to develop a closer relationship with them. Consumers started to have an online profile, shaped by their personality and preferences and enterprises could personalize their services according to their target audience. In the same time, internet has become the main information and communication source, influencing more people than television or any other source[7]. According to Yoo and Gretzel (2011), the main contribution of Web 2.0 is the new form of word of mouth created, which offers specific and experiential information with access beyond the boundaries of one's immediate social circle[8].

One of the main characteristics of tourism services is intangibility and the fact that they are purchased before and away from the moment and the place of consumption. Hence, an important role is played by descriptions and representations[9], explaining why this stage of internet had a strong impact on the development of the industry trends, affecting all the participants to the process. Through Web 2.0, the consumer has access to information, is able to make online bookings and has much more choices than in the past. Now, the consumer has direct access to the tourism providers (hotels, airlines), not only to the intermediates (the travel agencies), which made significant changes and a switch of power in the system. The consumer starts to become the central piece of the tourism system.

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[5] Mistilis N, Buhalis D, *Challenges and potential of the Semantic Web for tourism*, eRTR, vol 10, 2012, p. 51

[6] Hamid Ouyoub, *Apports et applications du Web 2.0 dans l'industrie du tourisme*, 2011, Universite de Fribourg, p.11

[7] Anne CHABOT, *Travel 2.0: future of tourism?*

[8] Noti Elton, *Web 2.0 and its influence in the Tourism Sector*, European Scientific Journal, July 2013

[9] Buhalis Dimitrios, *Strategic use of information technologies in the tourism industry*, p. 3

The modern consumer is sophisticated, he has access to information and he has many choices, explaining why he is interested in personalized services. In the same time, because of the gain of visibility on the internet of small and medium enterprises and also the direct communication between providers and consumers, the competition increased and all enterprises had to reinvent their strategies and find innovative approaches to attract the modern travel consumer. Being confronted to multiple choices and because of the changes in his personality (dynamic lifestyle, multitasking activities), the new sophisticated consumer needs a rapid identification of its needs and personalized approaches, in order to fulfill these specific needs[10].

Web 3.0 contributed to the emancipation of the consumer and changed the whole existing system. Also named the Semantic Web, Web 3.0 was introduced in 2001 and it makes data interoperable and capable of manipulation by computer programs[11], the foundation basis of personalization. These new stages of web development focus on recomandation systems. A recomandation system indicates the appropriate options in a specific case, to a certain category of consumers (Resnick & Varian, 1997, Gretzel et al., 2004)[12]. Recommandation systems extract the data from the virtual identity of the user and use it in order to create a typology and create recommandations corresponding to it. Still, the travel and tourism industry is very complex and highly fragmented. Also, due to the fact that the industry has developped in the same as the evolution of technology, there is a high number of informatic systems of different structures, which determines a lack of commun standards and a fragmentation of the information process. [13] At this level, centralizing the existing data would be the key to better personalization of services.

REINVENTING CUSTOMER SERVICE: AIRLINE INDUSTRY – A PIONEER IN EXISTING TRENDS

The progress of technology had a big impact over the years on aviation and on the tourism industry. The airline industry has always been considered a pioneer in the tourism industry. The international tourism began shaping once the international flights started to develop; CRS and GDS were the first stages

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[10] Buhalis D, *Progress in information technology and tourism management: 20 years on and 10 years after the Internet —The state of eTourism research*

[11] Mistilis N, Buhalis D, *Challenges and potential of the Semantic Web for tourism*, eRTR, vol 10, 2012, pag 1

[12] Buhalis D, *Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research*

[13] Rosemary Stockdale, Bernhard Rieder, Sven Ktihne, *Developing a Business Model using Open Source Software: A Tourism Case Study*

of the electronic multi-distribution systems; with new routes opening, new technology allowing to extend the capacity of the airplane, traffic grew significantly and aviation became an important part of the modern society, becoming also the main target of terrorists, which is an important risk that the tourism industry faces nowadays.

The new necessary security regulations had a strong impact on airports, airlines and the passenger experience and determined considerable changes. The rigorous security controls determined more stressful time spent at the airport which led to the congestion of airports, considerable delays and money loss for airlines, missed flights and negative passenger experience. The airport is an important element, as it represents the connecting point between the airline and the passenger. An improper organization of the airport determines direct and indirect (insatisfied customer) losses for the airlines.

One of the main priorities of the airport today is to fluidize traffic, keeping the necessary measures of security and concentrating on the passenger and his needs, trying to make the airport experience an enjoyable one. This is important especially from an economical point of view. The airport has different business partners: the airlines and other companies that generate money out of aviation, but also companies, which have a contribution not generated directly by aviation (Duty Free, Duty Pay, retail, catering, car rental, ticketing, ATM, parking, offices etc)[14]. In the past, the main income of an airport was aviation; due to the liberalization, airlines had to keep the prices low and grow the number of passengers, reducing the expenses and the financial flow[15]. In the same time, airports were forced to find other ways to ensure revenue growth and maintaining profitability, mostly by focusing on revenue generated out of non-aviation activities (retail, services, food and beverages, parking and passenger access)[16]. The centerpiece of the non aviation activities in airports is represented by the passenger[17]. As a result, it is important to create to him the state of mind to explore these possibilities, trying to make the experience unstressful and also offering him services according to his needs and profile.

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[14] Sava Augustin, Realities and perspectives in modern airport management, PhD Thesis, Lucian Blaga University, Sibiu 2012

[15] Freathy, P. and O'Connell, F. *Planning for Profit: the Commercialization of European Airports: Long Range Planning*, Vol. 32, No.6, 1999, p. 589

[16] Zenglein J. Max, Muller J, *Non aviation revenue in the Airport Business –Evaluating Performance Measurement for a Changing Value Proposition*, Berlin School of Economics, 2007

[17] Dr. Fattah Amir, Lock Howard, Buller William, Kirby Shaun, *Smart Airports: Transforming Passenger Experience to Thrive in the New Economy*, 2009, Cisco Internet Business Solutions Group

One of the most important factors the airports must consider is that collaboration with the stakeholders is fundamental. The lack of data exchange between the airlines, the airports and the authorities leads to a fragmented passenger flow, discontinuity of the airport operations and passenger insatisfaction. Technology is the element able to connect the airport to its stakeholders for an exchange of information and services. This way, the passenger flow would be more compact and a less stressful experience for the passenger, who would also appreciate being constantly informed in real time and having personalized services delivered to him.

Airports have evolved significantly over the last 30 years, as a necessity of supporting the global development of the airline industry. The liberalization determined the growth of the passenger traffic as well as the number and variety of flights. Both airlines and airports had to adopt new strategies in order to face the new market demands: airlines became part of partnerships and alliances and airports were grouped in "hubs", which together contributed to the creation of "air transportation ecosystems"[18]. As the airports developed, different development stages have been distinguished[19]:

a. Conventional Airports - This stage existed in the 1980s and ensured a safe and efficient management of flight operations (landings, departures and other aircraft operations). The services offered are basic: check-in, boarding, security, baggage drop and pick-up and moderate retail and food and beverage services[20], without any collaboration actually existing between these services, which were independent.

b. E-airports - There is a converged network which allows offering shared services to passengers, still, with limited collaboration among the components of the airport ecosystem. Also named "the agile airport", this stage offers advanced operational efficiencies, with faster turnaround times for airlines and improved passenger experience[21]. Airports implement different programs and applications meant to create a more pleasant passenger experience. Some of the airports implemented the Passenger Gait Mapping using Augmented Vision Technology (identifying parameters as stride, speed, movements of the passenger in order to eliminate airport congestion), most of the airports and airlines are using social media applications in order to directly communicate

[18] Idem

[19] Pethuru Raj, Anupama C. Rama, *Intelligent Cities: Enabling Tools and Technology*, p. 384

[20] Dr. Fattah Amir, Lock Howard, Buller William, Kirby Shaun, *Smart Airports: Transforming Passenger Experience to Thrive in the New Economy,* Cisco Internet Business Solutions Group, 2009

[21] Idem

with the passengers, conduct surveys, advertise promotional offers or even offer services on board (selecting co-passengers based on an existent internet profile). Many of these airports focus on entertaining activities, creating digital interactive areas but also other facilities as spa, movie theaters, art and gaming zones.

c. Intelligent Airports - These airports are using systems build around a unique converged IP network which enables rapid communication and exchange of information between all the components of the ecosystem (airlines, airport, authorities, other parties). Using the common passenger data, the system is able to anticipate the needs of the passenger and offer recommandations for personalized services.

Considering that between 2010 and 2030, commercial passenger traffic is expected to increase globally from 4.9 billion to approximately 13.3 billion[22], it is important for the airports to find ways to better manage their operations and to find innovative solutions. According to SITA, global leader in the sector of ICT in the airline industry, the airport of the future should include[23]:

- Systems allowing to monitor the airplanes
- Real time communication between the ground services in order to avoid discontinuity in flight operations
- Identification of the passenger's location in the airport, keeping them updated on the delays, flight or terminal changes
- Tracking the luggages, in order to facilitate transfers and to avoid baggage loss
- Creating a centralized system to control all the operations is the key element of the modern airport and the basis of personalized services.

TSA (Transportation Security Administration) started working with SITA to implement a management system of the passenger services, using Bluetooth. The system is to be implemented the next years in over 179 airports in the United States and will allow the airport staff to prioritize the services, receive real time information about every passenger, its location in the airport and the time he has left until boarding[24]. In the same time, having the exact location of the passenger inside the airport, additional services can be offered to him, in order to enhace his experience. The first system of this kind has been implemented in 2011 in the Copenhagen Airport[25]. This application offers passengers assistance inside the airport (directions, flight information), suggestions regarding shops, restaurants or other services, according to the geo-

[22] http://www.ccadf.cn/upload2/0119909319065294bbef1b9ede189de2.pdf
[23] Sita.aero.com (Air-Transport-IT-Review-issue3-2012-v2.pdf)
[24] Sita.aero.com (Air-Transport-IT-Review-issue3-2012-v2.pdf)
[25] Sita.aero.com (Air-Transport-IT-Review-issue3-2012-v2.pdf)

location of the passengers as well as his online identity and preferences. The application uses different signals to determine the location of the mobile phones of the passengers, giving important information according to the point where they are (check in, security, border, gate). The airport in Copenhagen collaborates also with the retail companies, giving different discounts and special offers to the passengers, according to their preferences and online identity.

Although the number of airports which implemented this kind of system is reduced and most of them face a fragmented flow of operations, all big airports started the process of reinventing passenger service: using the mobile or online kiosks for check-in, baggage self tagging or mobile apps allowing the passengers to choose additional services before boarding. The airline industry is inventing a new form of customer service, according to the requirements of the industry but also according to the profile of the new tipology of the modern traveler. It is a form of "assisted self-service", the passenger having the option to act on his own, but being given the correct guide lines and suggestions.

Introducing "self service" in airports, the passenger gains control over the offered services, confort and flexibility, as it can be done at any moment and from multiple locations, reducing the waiting time at the airport (Meuter, 2000)[26]. The passenger can make his own check in, tag and check his own luggage. These are the most basic exemples reflecting how technology has changed so far passenger service in airports. Introducing biometric systems continue this process, giving a more secure process, confort for the passenger, decongestion of passenger flow, reduced waiting times, personalized services during the whole process, with the collaboration between airlines, authorities, airport and other parties.

Still, there are some disadvantages to be considered: the security of information, violation of privacy or religious considerations in some cases. Also, on a larger scale, the question remains if the technologization of service is an alternative suitable for all the age categories. Statistics indicate that persons over 65 years old represent an important segment of the potential tourism market (between 2006 and 2011, when the economic crisis affected the tourism industry, the number of tourists decreased in all age categories, except the 65+, which had a 10% increase in 2011, compared to 2006)[27]. Another industry report indicates that active seniors represent one of the four segments which will have an impact on the airline industry in the next 15 years[28].

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[26]Meuter L Matthew, Ostrom L. Amy, Roundtree I. Robert, Bitner Mary Jo: *Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters*

[27] http://epp.eurostat.ec.europa.eu

[28] Drennen Hannah, *Self Service Technology in Airports and the Customer Experience*, PhD thesis, 2011, University of Nevada, Las Vegas, p.16

In this context, the question is how are these generations going to accept this new approaches and how would they face the new changes? Is self service and computerized interaction generally accepted or is it suitable only for a specific category of travelers? Introducing "self service" or other technological applications will allow the airport staff to providing assistance to the passengers who face difficulties during the process[29]. Self service technology will allow the passengers to get control over the easy processes, giving them confort, flexibility, control and the airport staff will have more time to offer special assistance to the passengers who require more attention. In the same time, IBM, representing one of the most important kiosk distributors, is planning to launch special equipement for persons with disabilities[30].

CONCLUSIONS

The evolution of technology has been closely connected with the development of tourism and especially of the airline industry. This process started with the systems of reservations CRS and with the global systems of distributions GDS, then it was followed by internet and its considerable impact, redefining the entire society, human behavior and business models. Technology represented the key point in the development of the international tourism, through the development of the airline industry. The airplane became the most important transportation mean, allowing to reach in a matter of hours different parts of the world which were not accessible before.

The modern passenger lives in a world where his family and friends are in different parts of the globe, at a flight distance, where international commerce made territorial borders disappear and where internet gives the opportunity of traveling in time and space. The modern traveler has access to information, has a dynamic lifestyle, lives in a digital world and uses technology for each aspect of his life.

In the tourism industry, information technology represented the opening of international markets, the development of the small and medium enterprises, the beginning of the direct contact between the consumers and the providers, decreasing the role of the intermediairies, which were dominating the sector in the past. All these aspects led to the creation of the typology of the new "sophisticated tourist", who needs control, personalized services, confort and flexibility.

[29] Drennen Hannah, *Self Service Technology in Airports And the Customer Experience*, PhD thesis, 2011, University of Nevada, Las Vegas, pag 16

[30] http://www-03.ibm.com/able/news/selfservkiosk.html

Starting from these points, the approaches of the companies had to change and the business model had to be reinvented. Tour operators are oriented in personalizing tourist packages, providers are trying to make an online identity and communicate directly with the consumers, and intermediairies also are oriented to gaining an online profile. In the same time, the development of internet led to a strong fragmentation of the sector. The researchers mention more and more the necessity of a centralized system in order to take advantage of the new trends and respond to the modern traveler's needs. Destination management systems have already been implemented in some regions with the purpose of better connecting and managing their entities. Still, the biggest efforts of centralizing information are done within airports, because of the strong fragmentation of their operations, the constantly growing traffic and the specific requirements (security). This process is in an early stage of development, but it is expected to evolve rapidly. In the specialized literature, the new intelligent cities of the future and the airport - cities are already mentioned, having the exact concept of informatics and centralized data networks.

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