

Smart Travel Planning to the Algarve by Older Tourists before the Covid-19 Pandemic Crisis

Conceição Ribeiro  ¹

Carolina Rocha Silva  ²

Paula Serdeira Azevedo  ³

Manuela Pires Rosa  ⁴

1. Centre of Statistics and Applications, University of Lisbon and Engineering Institute, University of Algarve, Faro, Portugal

2. University of Algarve, Faro, Portugal

3. CiTUR - Centro de Investigação, Desenvolvimento e Inovação em Turismo, University of Algarve, Faro, Portugal

4. Research Centre for Tourism, Sustainability and Well-being and Engineering Institute, University of Algarve, Faro, Portugal

ABSTRACT

Information and communication technologies, or ICT, have revolutionized societies' daily lives and the economy's development on a global scale. Senior tourism is considered a sector in solid expansion, and, as such, it matters to understand the importance that these tourists attribute to these technologies. The association between tourism and digitalization gave rise to the concept of "smart tourism". So, it is essential to have the necessary skills to be active in a world mediated by the internet. It is not just tourist destinations that have evolved in the present digital age; tourists, themselves, have also changed. However, this digitalization has not equitably reached the entire senior population. The main goal of this article is to analyze the internet use by older tourists to plan their trip to the Algarve before the COVID-19 pandemic crisis. It has the specific objective of identifying and exploring what type of service they sought the information. The results indicate that there are statistically significant differences between different groups of respondents regarding the use of the internet to plan a trip to the Algarve.

KEYWORDS

Smart Tourism, Older Tourism, Information and Communication Technologies, Smart Travel Planning.

ARTICLE HISTORY

Received 12 September 2022 Accepted 30 November 2022

1. Introduction

In tourism, digital transformation plays a central role, contributing to the dissemination of tourism products and services, allowing stakeholders and tourists to enjoy the benefits of globalization and social changes (Erdogan, 2021).

Society is becoming increasingly digital, systematically resorting to the use of the internet. Information and communications technologies (ICT) have become progressively more present, due to their accessibility and effectiveness, nowadays reaching its peak (Lee et al., 2020). Technologies thus play an important role in the development of numerous economic sectors, among which tourism is no exception (Medeiros et al., 2021).

ICT proves to be efficient and innovative when there is a diffusion within a social system, in which virtual reality technologies, augmented reality, image identification and recognition technologies are considered as the most promising technologies (Lee et al., 2020). In the opinion of Tsao et al. (2019), technologies such as virtual reality and augmented reality are a strong resource for seniors to rebuild their general awareness of their life value, philosophy and stories. These authors also argue that reminiscence therapies, using ICT, enable the activation of memories and cognitions in the older tourists, thus contributing to the prevention of dementia.

Information technologies are currently more accessible to the population, due to technological developments (Chang et al., 2019). The increase in accessibility is evidenced by the fact that 22% of the world population now own smartphones, 20% own personal computers (desktops and laptops), and 6% own tablets (Heggstuen, 2013). Smartphones are increasingly becoming the device of choice for consumers and tablets are gradually replacing traditional personal computers (Ko, 2018). In the realm of tourism, smart technologies have aroused great interest in the tourism field, since cities and destinations are increasingly "smart" (Atembe, 2015).

Smart tourism involves several elements supported by ICT (Law et al., 2020), which in turn are responsible for innovations in tourism (Buhalis, 2006; Buhalis et al., 2008). Furthermore, through interactive services and connectivity, ICT provides more accessibility and pleasure to tourists (Buhalis & Amaranggan, 2014). Three forms of ICT are vital to having a smart destination: IoT, cloud computing and end-user internet service system (Zhang et al., 2022).

Smart technologies are being developed by the tourism sector, with the awareness that they are very useful and practical for both consumers and providers of products and experiences. The use of smart devices in the tourist industry allows the maximization of the value of tourist resources and the production of enormous social and economic benefits (Pai et al., 2020). On the other hand, smart technologies are assuming an important role in supporting consumers through the implementation of QR code and sensors (Komninou et al., 2013). All this allows tourists to obtain necessary and relevant information, communicate, share experiences, among other activities.

But it's not just tourist destinations that have evolved in the present digital age, tourists themselves have also changed. In the last two decades, the intense use of ICT has resulted in a radical change, in terms of tourist consumer behaviour (Neuhofer et al., 2012; Buhalis et al., 2015; Neuhofer et al., 2015). Tourists are currently independent and skilled (Park et al., 2019) and have become more demanding, active and informed. They have seized new ways of searching for information and comparing, booking, interacting, sharing, complaining, reviewing and recommending (Buhalis, 2006; Buhalis & Law, 2008). Thus, according to Benckendorff et al. (2014) and Pearce (2011) these changes have shaped the digital tourist.

Tourists have been going through a great change, resorting to research, booking, personalization and communication, using new technologies. Due to the adoption of smart devices, more and more tourists plan their trip alone, without resorting to travel agencies, as they once did (Pai et al., 2020). Ko (2018) specifies that 88% of travel searches are done through personal computers and tablets and 27% are carried out through smartphones and search engines and online travel agencies have a dominant position in the marketing of hotels. The majority of hotel reservations are made from personal computers and tablets (81%), followed by reservations made through smartphones (21%). In the same study, it was possible to verify that search engines, family and friends are the most used sources of information for choosing hotels.

Currently, the search for information and online travel booking no longer occurs only through websites. These provide services for choosing and booking hotels, selecting restaurants and purchasing airline tickets (Balasubramanian et al., 2015; Wang et al., 2016; Suki & Suki, 2017).

Airline companies are offering airline ticket booking applications that individuals can download to their mobile devices. According to Parker (2017), in 2016, only 13% of the US population used their mobile phone to book holidays online or buy plane tickets, this is because the process is more challenging than making online reservations using a personal computer.

The development of the digital world has given rise to concepts such as digital competence, which involves the confident and critical use of Society and Information Technologies (IST) in work, leisure and communication. In this context, it is necessary to have digital literacy, that is, to have the necessary skills for a person to be an active member in a world mediated by the internet. In the western world, the senior population has been adapting to this digital age. The percentage of internet-users aged 55 and over has been increasing steadily in almost all European countries (Pesonen et al., 2015).

According to Eurostat information, in the EU-27, in 2019, some 28 % of the EU-27 population aged 65-74 years made at least one online purchase (for private purposes). In 2018, the percentage who participated in tourism for personal purposes (therefore excluding tourism linked to business purposes) was 49% (Eurostat, 2020).

In addition to the internet, senior people also use electronic devices to their advantage. Some studies show that they use smartphones and tablets to access electronic health services, to make social connections, to read books on the internet and for communication in general (Hardill & Olphert, 2012; Martinez-Pecino et al., 2012; Wan & Chan, 2013).

However, this digitalization has not reached the entire senior population in an equitable way. In a study carried out with the Swiss senior population, it was possible to verify that younger seniors use the internet more when compared to older seniors, and in this study, only 4.9% of seniors aged 85 and over use the internet regularly (Friemel, 2014). It was also observed that gender differences in internet use disappear when education, marital status and technical interest are similar in both genders. It was also observed that family and friends are strong influencers on the use of the internet (Friemel, 2014). Other studies indicate that the internet is used much less by retired older people (Shim et al., 2005) and by those with a lower level of education (Batra, 2009). Retired seniors, as well as senior people with a lower level of education, are more dependent on travel agents (Alén et al., 2017).

This was the context of the project ACCES4ALL - Accessibility for All in Tourism (2017-2019) that developed a case study of an age friendly and digital bus stop, with availability of Wi-Fi and information through an interactive panel to be located at the Faro International Airport, in the Algarve. The universal accessibility of information considers all users and should be addressed in this type of urban furniture. The question was whether older tourists have enough digital literacy to use these cutting-edge technologies.

Thus, as part of this project, surveys were conducted on older tourists (aged 60 and over) users of Faro International Airport. The questionnaires contained four sets of questions: information about the respondents, characterization of their mobility, information about the perception of universal accessibility conditions at bus stops, and their use of information and communication systems and technologies.

The main goal of this article is to study the use of the internet by older tourists to plan their trip to the Algarve. It has the specific objective of identifying and analysing what type of service they sought for information.

2. Case Study - The Project Accessibility for All in Tourism

The Algarve is located in the southernmost area of continental Portugal, which allows for a privileged contact with the Atlantic Ocean and to enjoy a mild and inviting climate for the many visitors it welcomes every year. With 16 municipalities and 67 parishes, the region combines multiple landscapes from the coast, *barrocal* and mountains with tradition rooted in its people and their customs.

In 2020 the Algarve was the main destination in Portugal with 30.1% of the total overnight stays in the country, having the second largest share (22.5%) of the country in the number of hotel accommodations, and 38.6% in bed capacity, the highest number in Portugal. In this region, overnight stays by tourists from

the United Kingdom accounted for 25.9% of the total overnight stays in hotels, the most represented market, followed by the German market (16.4% of total). Overnight stays in coastal areas accounted for 98.4% of the total for the region and 38.7% for the country, also the largest share (Instituto Nacional de Estatística, 2021).

Faro International Airport is located in central Algarve, the southernmost region of continental Portugal, and represents the main gateway for tourists to the region. Opened in the 1960s, it serves the Algarve region, Baixo Alentejo and together with Seville airport, also serves the Spanish community of Andalusia, especially the province of Huelva on the border with Portugal, 65 km east of Faro. According to ANA (2019), the airport operates international and domestic flights, mainly tourist oriented and with pronounced seasonal peaks. It handles over 40,000 flights per year, and the busiest time for air traffic is between March and October, especially during the summer months, when thousands of tourists, mostly from the UK, choose the Algarve and southern Spain for their vacations. In the months of July and August, Faro Airport records averages close to 200 flights per day and handles more than 25,000 passengers per day. In 2019, Faro Airport handled 9,009,000 passengers.

The main goal of the Project ACCES4ALL was to develop a pilot study of an accessible, smart and sustainable bus stop to be located in the most important transportation hub in Algarve, the Faro International Airport. A collaborative approach was developed which considered different interconnected actions: contacts and workshops with institutions and enterprises; questionnaire-survey for older tourists at Faro Airport; walking and observing people with visual disability and people in wheelchairs in the city of Faro and at Faro Airport.

In this project ICT are considered a key tool for promoting equity in access to information. Information accessibility according to the universal design approach should be systematically applied to modal interfaces. Therefore, it was important to understand the digital literacy of older tourists and their experience in the use of the internet to plan a trip to the Algarve.

3. Methodology

To understand the needs of older people in terms of their mobility and communication, a questionnaire-survey was developed by the research team. It considers four sets of questions: (1) information about the respondent; (2) characterization of their mobility; (3) information of the universal accessibility of a bus stop; (4) use of information and communication systems and technologies. The characterization of older tourists was made considering gender, age, level of education, professional occupation, country of residence, city or town where they reside, disabilities affecting mobility and the need for technical aids to get around the town.

The survey was developed for foreign older tourists aged 60 or over, considering that an older person is defined by the United Nations as a person who is over 60 years of age (UNHCR, 2018). The outbound markets for Portugal go beyond the European countries, where the ageing population is considered to be over 65 years old (Eurostat, 2020). Residents in countries such as Brazil, Canada and the United States of America seek out the national territory (Padinha et al., 2021).

Inquiries were developed in April, August and September 2018 and conducted randomly by professional inquirers at Faro International Airport, mainly in waiting areas before departure. During the survey, the interviewers used photographs to explain technical aspects to older tourists. Inquiries, totalling 851, produced considerable data that was introduced into an electronic file, using advanced statistical analysis capabilities of IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, N.Y., USA). Because of the low frequency of participants who were 90+ years old, 85+ year old participants were grouped.

This article only focuses on the use of information and communication technologies, referring to the fourth part of the applied questionnaire surveys. It should be noted that in this part, there are only two questions regarding the use of the internet to plan a trip to the Algarve and the indication of the type of service for which the older tourists sought the information.

The characterization of the older tourists was made by gender, age, level of education, disability condition and country of residence. Bar graphs, representing frequency of use of the internet for making reservations related to a trip to the Algarve by age, level of education, gender, disability condition and country

of residence, were created with error bars representing a 95% confidence interval. The chi-square test of independence was used to assess the statistical significance of relationships between the several groups of older tourists for each characteristic regarding the use of internet for making reservations related to a trip to the Algarve. The level of statistical significance was set at 5%, thus whenever results provided , it was assumed that there is statistical evidence to consider that the study variables are dependent and that the differences tested are statistically significant. To improve the performance of the chi-square test, in the case of the analysis by age and by level of education, only 3 groups were considered, namely 60-69, 70-79 and 80+ and namely Basic+Secondary, Vocational and Higher Education. The error bars in the bar graphs complement chi-square test results indicating the groups (by age, gender, level of education, disability condition and by country of residence) with significant differences regarding the study variable (the use of the internet for making reservations related to a trip to the Algarve) by looking for the overlap of the correspondent error bars.

4. Results

To characterise the respondents, 60.7% are male and 39.3% are female; 44.8% are in the age group 60-69, 39.8% in the age group 70-79 and only 15.4% aged 80 or over. Considering the different levels of education, 25.7% Basic Education and Secondary School, 54.0% Vocational/Technical Training and 20.3% have a Higher (Tertiary) Education (Table 1).

Table 1. Characterisation of the Sample of Older Tourists

Variable	Category	Sample	
		n	%
Gender	Male	513	60.7
	Female	332	39.3
Age group	60-69	376	44.8
	70-79	334	39.8
	+ 80	129	15.4
Level of education	Basic Education and Secondary School	214	25.7
	Vocational/Technical Training	450	54.0
	Higher (Tertiary) Education	169	20.3

Source: Own Elaboration

In respect of the disability condition, 25.3% answer that they have some disabilities affecting their mobility. In terms of country of residence, the respondents came from more than 30 countries, mainly from Europe as 40.6% came from the United Kingdom, 13.8% from Germany, 8.6% from Ireland, 7.8% from France, 4.5% from The Netherlands, 3.3% from Italy and 3.2% from Belgium, just to indicate the main ones. This data is in line with the data from the main source markets present at Faro International Airport in 2019. Regarding the origin of the demand, five international markets represent 84.3% of the total passengers processed: United Kingdom, Germany, Ireland, France and the Netherlands (Padinha et al., 2021).

The total percentage of elderly tourists surveyed that use the internet is 97.5%, which means that the vast majority of respondents use the internet (Vieira et al., 2022).

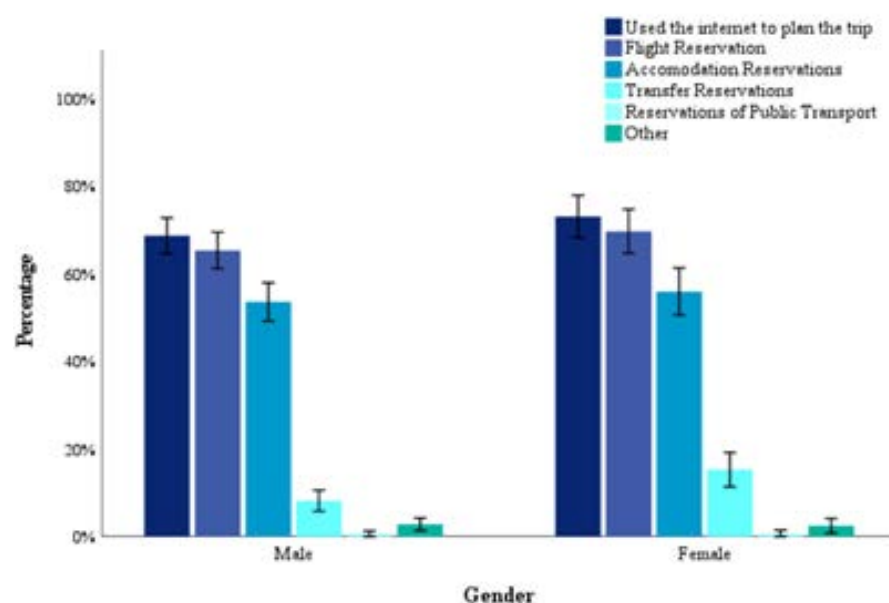
4.1 Use of the Internet to Plan a Trip to the Algarve

70.3% (589) of the senior tourist respondents used the internet to plan a trip to the Algarve, 65.8% (558) used it to make flight reservations, 53.3% (452) for accommodation reservations, 10.7% (91) for transfer reservations, 0.6% (5) for public transport reservations and 2.6% (22) used it to make other reservations.

4.2 Use of the Internet to Plan a Trip to the Algarve by Gender

When analyzing the data concerning male senior tourists, it can be seen that 68.9% (348) of them used the internet to plan a trip to the Algarve, 64.3% (328) used it to make flight reservations, 52.7% (269) for accommodation reservations, 8.0% (41) for transfer reservations, 0,6% (3) for public transport reservations and 2.7% (14) for other reservations. Regarding female senior tourists, 73.1% (239) of them used the internet to plan a trip to the Algarve, 68.7% (104) used it to make flight reservations, 15.1% (50) for transfer reservations, 55.1% (183) for accommodation reservations, 0,6% (2) for public transport reservations and 2.4% (8) for other.

Figure 1. The use of the Internet to Plan a Trip to the Algarve by Gender



Source: Own Elaboration

In this case, the results show that there are statistically significant differences between men and women regarding the use of the internet for transfer reservations, [$\chi^2(1; n=842)=10.28, p=0.001$], suggesting that women are more likely to use the internet for transfer reservations than men. Nevertheless, there are no statistically significant differences between men and women regarding the use of the internet to plan a trip to the Algarve, [$\chi^2(1; n=832)=1.67, p=0.197$], to make flight reservations, [$\chi^2(1; n=842)=1.71, p=0.192$], accommodation reservations [$\chi^2(1; n=842)=0.456, p=0.499$], public transport reservations [$\chi^2(1; n=842)=0.001, p=1$] and other reservations. [$\chi^2(1; n=842)=0.089, p=0.829$].

4.3 The use of the Internet to Plan a Trip to the Algarve by Age

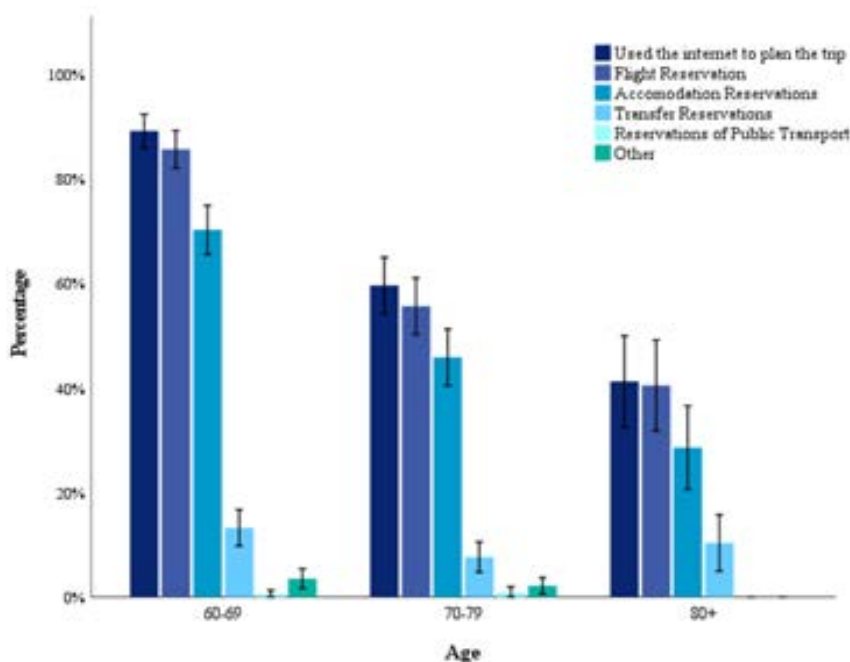
Analyzing the data considering age, it can be seen that 89.2% (332) of the senior tourist respondents aged between 60-69 used the internet to plan a trip to the Algarve, 84.8% (317) used it to make flight reservations, 69.5% (260) for accommodation reservations, 13.1% (49) for transfer reservations, 0.5% (2) for public transport reservations and 3.5% (13) used it to make other reservations. Moreover, 59.6% (195) of the senior tourist respondents aged between 70-79 used the internet to plan a trip to the Algarve, 54.5% (182) used it to make flight reservations, 44.9% (150) for accommodation reservations, 7.5% (25) for transfer reservations, 0.9% (3) for public transport reservations and 2.1% (7) used it to make other reservations. Finally, 41.7% (53) of the older tourist respondents 80 years old or over, used the internet to plan a trip to the Algarve, 39.8% (51) used it to make flight reservations, 28.1% (36) for accommodation reservations, 10.2% (13) used it to make transfer reservations. As for the use of the internet to make public transport and other reservations, none of the older respondents aged 80 or over used it.

For this case, the results show that there are statistically significant differences between the different age groups regarding the use of the internet to plan a trip to the Algarve, [$\chi^2 (2; n=826)=131.21, p<0.001$], to make flight reservations, [$\chi^2 (2; n=836)=117.03, p<0.001$], to make accommodation reservations, [$\chi^2 (2; n=836)=81.57, p<0.001$] and to make transfer reservations, [$\chi^2 (5; n=836)=5.48, p=0.05$].

Moreover, the results suggest that there is a decrease in the use of the internet to plan a trip to the Algarve, to make flight reservations and to make accommodation reservations as the age increases.

Moreover, the results suggest that there is a decrease in the use of the internet to plan a trip to the Algarve, to make flight reservations and to make accommodation reservations as the age increases.

Figure 2. The use of the Internet to Plan a Trip to the Algarve by Age



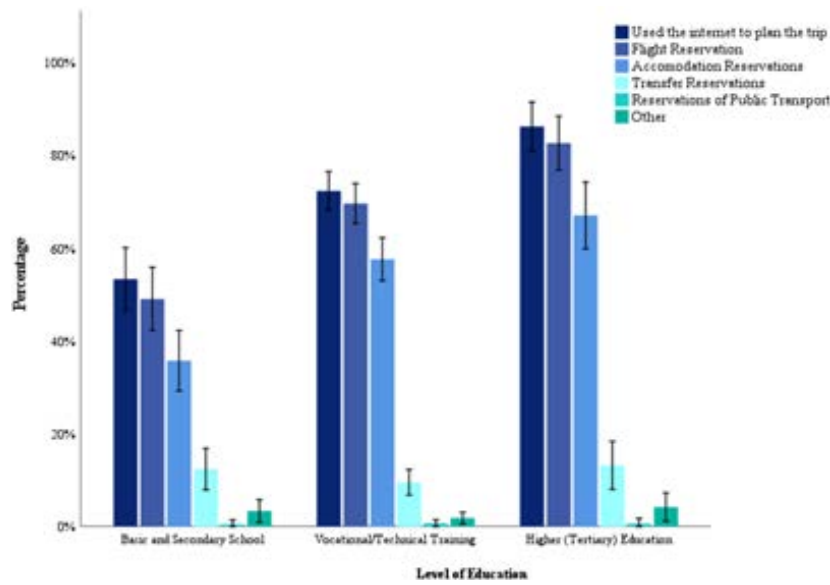
Source: Own Elaboration

4.4 The use of the Internet to Plan a trip to the Algarve by Level of Education

Concerning the use of the internet to plan a trip to the Algarve by level of education, it can be observed that 53.3% (112) of the older tourist respondents with Basic and Secondary Education used the internet to plan a trip to the Algarve, 48.1% (103) used it to make flight reservations, 35.0% (75) for accommodation reservations, 12.1% (26) for transfer reservations, 0.5% (1) for public transport reservations and 3.3% (7) for other. 72.5% (321) of the older tourist respondents with Vocational/Technical Training used the internet to plan a trip to the Algarve, 68.5% (307) used it to make flight reservations, 56.7% (254) for accommodation reservations, (42) 9.4% for transfer reservations, 0.7% (3) for public transport reservations and 1.8% (8) for other. 86.3% (145) of the older tourist respondents with Higher (Tertiary) Education used the internet to plan a trip to the Algarve, 82.1% (138) used it to make flight reservations, 66.7% (112) for accommodation reservations, 13.1% (22) for transfer reservations, 0.6% (1) for public transport reservations and 4.2% (7) for other.

In the case of level of education, the results indicate that there are statistically significant differences between the different levels of education groups regarding the use of the internet to plan a trip to the Algarve, [$\chi^2 (3; n=821)=51.03, p<0.001$], to make flight reservations, [$\chi^2 (3; n=830)=51.26, p<0.001$], to make accommodation reservations, [$\chi^2 (3; n=830)=42.84, p<0.001$].

Figure 3. The use of the Internet to Plan a Trip to the Algarve by Level of Education

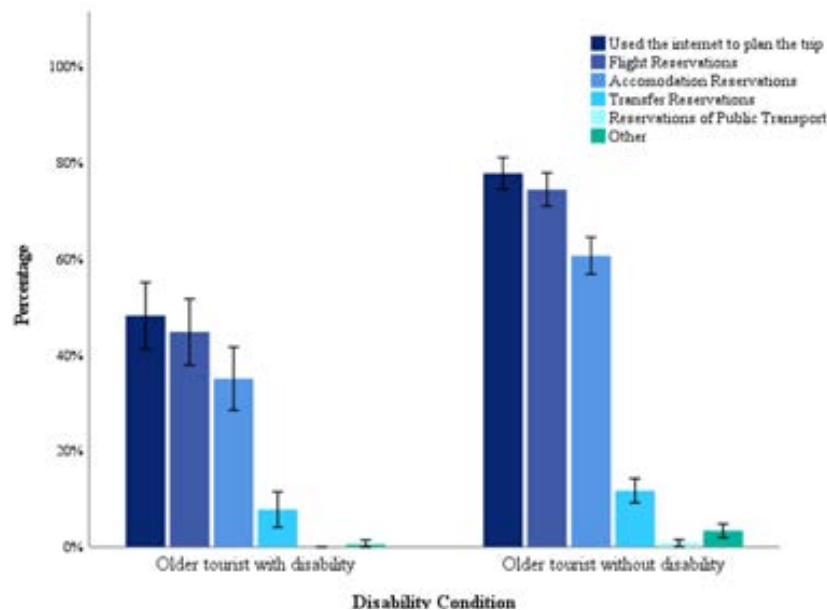


Source: Own Elaboration

4.5 The use of the Internet to Plan a Trip to the Algarve by Older Tourists with or without Disability

Concerning the use of the internet to plan a trip to the Algarve by disability condition, 48.1% (99) of the older tourist respondents with disability used the internet to plan a trip to the Algarve, 43.0% (92) used it to make flight reservations, 33.6% (72) for accommodation reservations, 7.5% (16) for transfer reservations, no one used it for public transport reservations and only 0.5% (1) used it to make other reservations. In the case of the older tourist respondents without disability, 77.7% (488) of them used the internet to plan a trip to the Algarve, 73.7% (464) used it to make flight reservations, 60.0% (378) for accommodation reservations, 11.6% (73) for transfer reservations, 0,8% (5) for public transport reservations and 3.3% (21) for other reservations.

Figure 4. The use of the Internet to Plan a Trip to the Algarve by Disability Condition



Source: Own Elaboration

The results reveal that there are statistically significant differences regarding disability condition and the use of the internet to plan a trip to the Algarve, [$\chi^2(1; n=834)=65.41, p<0.001$], to make flight reservations, [$\chi^2(1; n=844)=66.8, p<0.001$], to make accommodation reservations, [$\chi^2(1; n=844)=44.58, p<0.001$], other reservations, [$\chi^2(1; n=844)=5.17, p=0.023$],

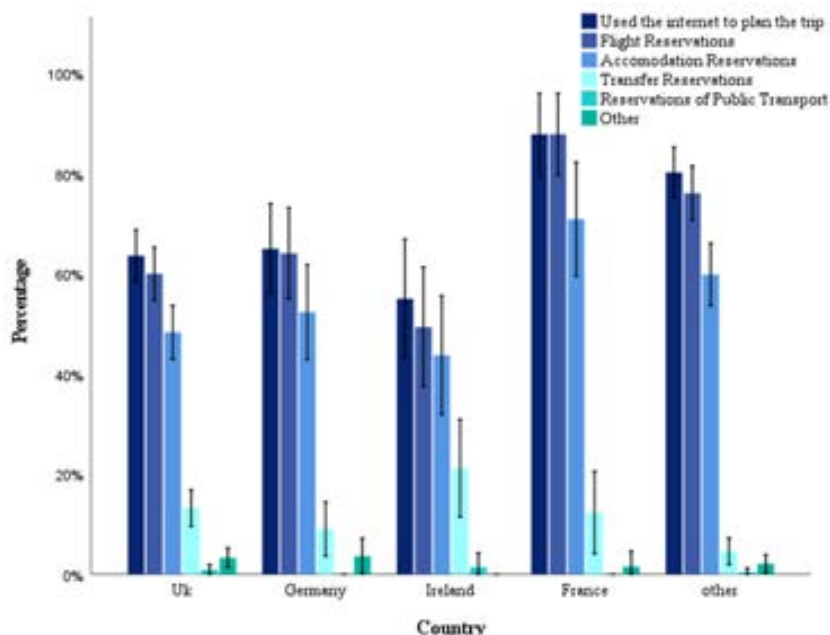
Regarding the use of the internet for transfer reservations, there is no difference regarding disability condition, [$\chi^2(1; n=844)=2.86, p=0.091$].

Regarding the use of the internet to make public transport reservations, as the values are very small the results are not valid.

4.6 The use of the Internet to Plan a Trip to the Algarve by Country

Concerning the use of internet to plan a trip to the Algarve by country 63.5% (212) of older tourists from the UK used the internet to plan a trip to the Algarve, 58.8% (200) used it to make flight reservations, 47.4% (161) for accommodation reservations, 12.9% (44) for transfer reservations, only 0.9% (3) for public transport reservation and 3.2% (11) used it to make other reservations. In the case of older tourists from Germany, 65.5% (74) of them used the internet to plan a trip to the Algarve, 62.3% (71) used it to make flight reservations, 50.9% (58) for accommodation reservations, 8.8% (10) for transfer reservations, no one used it to make public transport reservations and 3.5% (4) for other reservations.

Figure 5. The use of the Internet to Plan a Trip to the Algarve by Country



Source: Own Elaboration

The results indicate that there are statistically significant differences regarding the use of the internet to plan a trip to the Algarve analyzed by country of origin of the respondents, [$\chi^2(4; n=825)=37.01, p<0.001$], to make flight reservations, [$\chi^2(4; n=835)=40.16, p<0.001$], to make accommodation reservations, [$\chi^2(4; n=835)=19.16, p=0.001$] and for transfer reservations [$\chi^2(4; n=835)=20.18, p<0.001$]. Nevertheless, regarding the use of the internet for transfer insignificant differences.

5. Conclusion

Senior tourism has been a field of special interest for researchers and the academic community, having emerged in various academic studies in gerontology, travel and leisure time, with the older tourists being increasingly one of the most prominent market segments in the tourism sector (Alén et al., 2017; Patter-

son & Balderas, 2020). The debate about digital literacy of the older people has been increasing, since they currently have a higher level of use of technologies and the internet compared to previous generations (Martín et al., 2017). Senior people can play an active role in tourism travel planning through relational, information and communication technologies (Ramos-Soler et al., 2019) but the results of the present study show that, before COVID-19 pandemic crisis, the digital development of most senior persons were still lagging far behind.

With the development of information technologies and mobile applications, tourism activity allows for the diversification, dissemination and sharing of tourist products (Medeiros et al., 2021), thus proving the relevance of understanding and exploring the importance of ICT in senior tourism and assessing whether this sector is prepared to use the innovative technologies before, during and after a trip (Mandić & Praničević, 2019).

The present research is focused on the use of the internet by older tourists before a trip considering a survey developed before the COVID-19 pandemic crisis. It analyses the use of the internet to plan their trip to the Algarve, making flight reservations, accommodation and transfer reservations, among others. The results show that, before COVID-19 pandemic crisis, there are many older tourists that have digital literacy and plan their trips online. So, this study provides some insights for tourism managers to design or adjust online information about the place of destination. The websites have to enable older people with access requirements, to operate independently, that is, with autonomy, guaranteeing equitable use. Tourism managers and ICT experts have to create accessible websites take into consideration the principles of universal design.

The results show that there are statistically significant differences between the age groups, the levels of education, the tourists with(out) disability and the country of origin of the respondents. These differences confirm that there are a lot of older tourists who have no digital literacy. In fact, in a study developed by Wen et al. (2020) almost all senior tourists interviewed said they were afraid of using new technologies, especially when it comes to checking in at airports, hotels, and tourist attractions. And if they do not have any help from others to use this type of service, most older tourists interviewed are afraid and less willing to use smart technologies.

It's not just travel bookings that are associated with the growth of smart tourism. Currently, all tourist spaces and departments use smart devices, such as self-service check-in kiosks at hotels, check-in machines at airports, self-service ticket offices, and tourist guide systems at touristic attractions (Pai et al., 2020). Through the adoption of these smart devices, tourists thus benefit from a convenient and efficient system.

According to Ramos-Soler et al. (2019), many senior people choose their travel destination according to their experiences, as well as the recommendations of friends, and in some cases contrast this information with ideas found on the internet. In addition, the internet, considered as the most used information search tool, is often used to book accommodation and transportation.

The use and impact of technologies are related to traveller satisfaction (Law et al., 2020). Likewise, the use of technologies tends to increase the quality of tourist trips (Hrnjić et al., 2016). One of the essential tools for the satisfaction of travellers are smartphones, which play a crucial role in the leisure experience (Kirova & Thanh, 2019). The satisfaction of the travel experience has a positive effect both on tourist's happiness and on their intention to revisit the tourist destination (Pai et al., 2020), thus showing that it is beneficial for tourist destinations to invest in order to become smart destinations.

Smart destinations aim to improve tourist experiences through the use of the latest ICT and smart services (Boes et al., 2015). On the other hand, smart destinations are an innovative tourist destination, which guarantees sustainable development (Bifulco et al., 2016), capable of facilitating and improving the interaction of visitors with the experiences at the destination, and eventually the quality of life of residents (Lee et al., 2020). Finally, the construction of smart destinations has been focused on the needs of tourists and, through the combination of ICT, culture and innovation in the area of tourism, a quality service is promoted, tourism management is improved and the scale of economy increased (Buhalis & Amaranggana, 2014).

The 2020-2021 pandemic crisis is leading to the adoption of new approaches and technologies in the hotelier world (Lau, 2020). Live-streaming platforms and Wi-Fi 6 are promoted. 5G technology is installed,

which allows for better connectivity in terms of communication, and better use of artificial intelligence, the Cloud, the Big Data, the internet of Things, and other platforms. The pandemic has been reinforcing technological advances. Digitalisation tends to have a positive impact on the lives of senior persons.

Senior tourists significantly contribute to the reduction of seasonality in tourism (Patuelli et al., 2016; Otoo & Kim, 2018; Medeiros et al., 2021). There is, therefore, a need to rethink the use of ICT in this context, in order to promote greater involvement of senior tourists, tourist companies and places visited with their history and peculiarities, providing them with new experiences (Zhang et al., 2022). ICT should make tourists more active, since the articulation with mobile devices allows a greater level of interactivity. In fact, the speed of technological advances is changing the way individuals perceive the environment and the way consumers interact with companies and their products (Flavián et al., 2019). This is happening in the choice of tourist destinations by senior citizens, and the information available online is a determining factor in the attractiveness of the territories.

Considering the strengths of the Project ACCES4ALL, it gives innovating information to the use of the internet and other digital tools. The survey influenced a collaborative design process to develop inclusive and smart bus stops considering the perceptions of the older tourists and people with disabilities. The proposed smart and interactive panel has intelligent features to allow its adaptation to different users' needs (Rodrigues et al., 2018). In the case of elderly people, communication is attained, for example, using simple language.

Although the sample size is appreciable, this study has some limitations. The results should not be extrapolated to tourists, in general, because the majority come from developed European countries. Another limitation of the study is the larger proportion of men (than women) and the small number of respondents aged 85+ year old participants, probably with less digital literacy.

ACKNOWLEDGEMENTS

This paper was financed by National Funds through the FCT - Foundation for Science and Technology within the scope of the UIDB/04020/2020 project. The Project ACCES4ALL – Accessibility for All in Tourism (SAICT-POL/23700/2016) was sponsored by the Portuguese Science and Technology Foundation (FCT) through Portugal 2020, and by CCDR Algarve and CCDR Norte, co-funded by European Regional Development Fund (ERDF), through Regional Operational Programme of CRESA Algarve 2020 and Regional Operational Programme of Norte 2020.


REFERENCES

- Alén, E., Losada, N., & Carlos, P. (2017). Profiling the segments of senior tourists throughout motivation and travel characteristics. *Current Issues in Tourism*, 20(14), 1454–1469. <https://doi.org/10.1080/13683500.2015.1007927>
- ANA Aeroportos de Portugal (2019). *Annual Traffic Report 2019 – Faro Airport*. <https://www.ana.pt/en/corporate/reports/annual-reports>
- Atembe, R. (2015). The Use of Smart Technology in Tourism: Evidence from Wearable Devices. *Journal of Tourism and Hospitality Management*, 3(11/12), 224–234. <https://doi.org/10.17265/2328-2169/2015.12.002>
- Balasubramanian, K., Balraj, A., & Kumar, J. (2015). Customer preferences to select a restaurant through smart phone applications: an exploratory study. *Advanced Science Letters*, 21(5), 1489–1493. <https://doi.org/10.1166/asl.2015.6081>
- Batra, A. (2009). Senior Pleasure Tourists: Examination of Their Demography, Travel Experience, and Travel Behaviour Upon Visiting the Bangkok Metropolis. *International Journal of Hospitality & Tourism Administration*, 10(3), 197–212. <http://doi.org/10.1080/15256480903088105>
- Benckendorff, P., Sheldon, P., & Fesenmaier, D. (2014). *Tourism Information Technology* (Second Edition). Wallingford, Oxfordshire, UK; Boston, MA: CABI.
- Bifulco, G., Cantarella, G., Simonelli, F., & Velonà, P. (2016). Advanced traveller information systems under recurrent traffic conditions: Network equilibrium and stability. *Transportation Research Part B: Methodological*, 92, Part A, 73–87. <https://doi.org/10.1016/j.trb.2015.12.008>
- 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* (pp. 391–403). Springer, Cham. https://doi.org/10.1007/978-3-319-14343-9_29

- Buhalis, D. (2006). Information Communication Technology — Revolutionizing Tourism. *Tourism Management Dynamics*, 196–209. <https://doi.org/10.1016/B978-0-7506-6378-6.50031-7>
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the internet - the state of eTourism research. *Tourism Management*, 29(4), 609–623. <https://doi.org/10.1016/j.tourman.2008.01.005>
- Buhalis, D., & Amaranggana, A. (2014). Smart Tourism Destinations. In Xiang, Z., Tussyadiah, I. (eds.), *Information and Communication Technologies in Tourism 2014* (pp. 553–564). Springer, Cham. https://doi.org/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* (pp. 377–389). Springer, Cham. https://doi.org/10.1007/978-3-319-14343-9_28
- Chang, C., Liu, L., Huang, H., & Hsieh, H. (2019). Factors Influencing Online Hotel Booking: Extending UTAUT2 with Age, Gender, and Experience as Moderators. *Information*, 10(9), 281. <https://doi.org/10.3390/info10090281>
- Erdogan, H. (2021). Digital transformation in tourism: archaeotourism and its digital potential. In Farmaki, A., & Pappas, N. (eds.), *Emerging Transformations in Tourism and Hospitality* (pp. 115–126). Routledge. <https://doi.org/10.4324/9781003105930>
- Eurostat (2020). Ageing Europe: looking at the lives of older people in the EU: 2020 edition. Publications Office. <https://data.europa.eu/doi/10.2785/628105>
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented, and mixed reality technologies on the customer experience. *Journal of Business Research*, 100, 547–560. <https://doi.org/10.1016/j.jbusres.2018.10.050>
- Friemel, T. (2014). The digital divide has grown old: Determinants of a digital divide among seniors. *New Media & Society*, 18(2), 313–331. <https://doi.org/10.1177/1461444814538648>
- Hardill, I., & Olphert, C., (2012). Staying connected: Exploring mobile phone use amongst older adults in the UK. *Geoforum*, 43(6), 1306–1312. <https://doi.org/10.1016/j.geoforum.2012.03.016>
- Heggestuen, J. (2013). The death of social ROI – Companies are starting to drop the idea that they can track social media's dollar value [online]. Available from: <http://www.businessinsider.com/the-myth-of-social-roi-2013-10>
- Hrnjić, A., Šuta, N. & Velić, A. (2016). Innovation in Senior Tourism: Creating Energy Efficient And Health Supported Tourist Offer. *Review of Innovation and Competitiveness*, 2(4), 5–18. <https://doi.org/10.32728/ric.2016.24/1>
- Instituto Nacional de Estatística. (2021). Estatísticas do Turismo 2020. Lisboa: Instituto Nacional de Estatística. <https://www.ine.pt/xurl/pub/280866098>
- Kirova, V., & Thanh, T. (2019). Smartphone use during the leisure theme park visit experience: The role of contextual factors. *Information & Management*, 56(5), 742–753. <https://doi.org/10.1016/j.im.2018.11.008>
- Ko, C. (2018). Investigating Multiple Devices Used in the Hotel Reservation Process. *Open Access Library Journal*, 5(8), 1–14. <https://doi.org/10.4236/oalib.1104811>
- Komninos, N., Pallot, M., & Schaffers, H. (2013). Open Innovation Towards Smarter Cities. *Open Innovation 2013*, 34–4. European Union. <https://doi.org/10.2759/87245>
- Lau, A. (2020). New technologies used in COVID-19 for business survival: Insights from the Hotel Sector in China. *Information Technology & Tourism*, 22, 497–504. <https://doi.org/10.1007/s40558-020-00193-z>
- Law, R., Leung, D., & Chan, C. (2020). Progression and development of information and communication technology research in hospitality and tourism: A state-of-the-art review. *International Journal of Contemporary Hospitality Management*, 32(2), 511–534. <https://doi.org/10.1108/IJCHM-07-2018-0586>
- Lee, P., Hunter, W., & Chung, N. (2020). Smart Tourism City: Developments and Transformations. *Sustainability*, 12(10), 3958. <https://doi.org/10.3390/su12103958>
- Mandić, A., & Praničević, D. (2019). Progress on the role of ICTs in establishing destination appeal: Implications for smart tourism destination development. *Journal of Hospitality and Tourism Technology*, 10(4), 791–813. <http://doi.org/10.1108/JHTT-06-2018-0047>
- Martín, J. C., Mendoza, C., & Román, C. (2017). A DEA Travel–Tourism Competitiveness Index. *Social Indicators Research*, 130(3), 937–957. <https://doi.org/10.1007/s11205-015-1211-3>
- Martinez-Pecino, R., Lera, J. & Martinez-Pecino, M. (2012). Active seniors and mobile interaction. *Social Behaviour and Personality: an international journal*. 40(5), 875–880. <https://doi.org/10.2224/sbp.2012.40.5.875>
- Medeiros, T., Sousa, M., & Mendes, J. (2021). A Importância das Tecnologias de Informação e Comunicação no Turismo Sênior: Uma Revisão Sistemática. *Turismo: Visão e Ação*, 23(3), 579–594. <https://www.scielo.br/j/tva/a/Hn8rKMV97pD-ScmLSGJm3D/>
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2012). Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing & Management*, 1(1–2), 36–46. <https://doi.org/10.1016/j.jdmm.2012.08.001>
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Smart technologies for personalized experiences: a case study in the hospitality domain. *Electronic Markets*. 25(3), 243–254. <https://doi.org/10.1007/s12525-015-0182-1>
- Otoo, F., & Kim, S. (2018). Is there stability underneath health risk resilience in Hong Kong inbound tourism? *Asia Pacific Journal of Tourism Research*, 23(4), 344–358. <https://doi.org/10.1080/10941665.2018.1433700>

- Padinha, D., Miguel, S. & Almeida, C. (coords.) (2021). Plano de Marketing Estratégico do Turismo do Algarve [2020-2023]. Região de Turismo do Algarve.
- Pai, C., Liu, Y., Kang, S. & Dai, A. (2020). The Role of Perceived Smart Tourism Technology Experience for Tourist Satisfaction, Happiness and Revisit Intention. *Sustainability*, 12(16), 1–14. <https://doi.org/10.3390/su12166592>
- Park, E., Choi, K., & Lee, T. (2019). The role and dimensions of authenticity in heritage tourism. *Tourism Management*, 74, 99–109. <https://doi.org/10.1016/j.tourman.2019.03.001>
- Parker, G. (2017). Online travel booking trends. <https://www.ecommnet.uk>
- Patterson, I., & Balderas, A. (2020). Continuing and Emerging Trends of Senior Tourism: A Review of the Literature. *Journal of Population Ageing*, 13, 385–399. <https://doi.org/10.1007/s12062-018-9228-4>
- Patuelli, R., Mussoni, M., & Candela, G. (2016). The effects of World Heritage Sites on domestic tourism: a spatial interaction model for Italy. In *Spatial Econometric Interaction Modelling* (pp. 281–315). Springer, Cham. https://doi.org/10.1007/978-3-319-30196-9_13
- Pearce, P. (2011). Tourist scams: exploring the dimensions of an international tourism phenomenon. *European Journal of Tourism Research*, 4(2), 147–156. <https://doi.org/10.54055/ejtr.v4i2.71>
- Pesonen, J., Komppula, R., & Riihinen, A. (2015). Typology of Senior Travellers as Users of Tourism Information Technology. *Information Technology & Tourism*, 15(3), 233–252. <https://doi.org/10.1007/s40558-015-0032-1>
- Ramos-Soler, I., Martínez-Sala A.-M., & Campillo-Alhama C. (2019). ICT and the Sustainability of World Heritage Sites. Analysis of Senior Citizens' Use of Tourism Apps. *Sustainability*, 11(11), 3203. <https://doi.org/10.3390/su11113203>
- Rodrigues, J. M. F., Martins, M., Sousa, N., & Rosa, M. (2018). IoE accessible bus stop: An initial concept. In *Proceedings of the 8th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion* (pp. 137–143), Thessaloniki, Greece.
- Shim, S., Gehrt, K., & Siek, M. (2005). Attitude and behavior regarding pleasure travel among mature consumers: A socialization perspective. *Journal of Travel & Tourism Marketing*, 18(2), 69–81. https://doi.org/10.1300/J073v18n02_06
- Suki, N., & Suki, N. (2017). Flight ticket booking app on mobile devices: Examining the determinants of individual intention to use. *Journal of Air Transport Management*, 62, 146–154. <https://doi.org/10.1016/j.jairtraman.2017.04.003>
- Tsao, Y., Shu, C., & Lan, T-S. (2019). Development of a Reminiscence Therapy System for the Older Using the Integration of Virtual Reality and Augmented Reality. *Sustainability*, 11(17), 4792. <https://doi.org/10.3390/su11174792>
- UNHCR (2018). UNHCR Policy on Age, Gender and Diversity. UN High Commissioner for Refugees.
- Vieira, G. M., Manita, C. B., Ribeiro, C., Rosa, M. P. (2022). Digital literacy of elderly tourists in the Algarve destination. *Journal of Accessibility and Design for All*, 12(2), 180–211. <https://doi.org/10.17411/jaccess.v12i2.314>
- Wan, Y., & Chan, S. (2013). Factors that Affect the Levels of Tourists' Satisfaction and Loyalty towards Food Festivals: A Case Study of Macau. *International Journal of Tourism Research*, 15. <https://doi.org/10.1002/jtr.1863>
- Wang, X., Xiang, R., Zhen, F., & Zhang, J. (2016). How smart is your tourist attraction? Measuring tourist preferences of smart tourism attractions via a FCEM-AHP and IPA approach. *Tourism Management*, 54, 309–320. <https://doi.org/10.1016/j.tourman.2015.12.003>
- Wen, J., Liu, X., & Yu, C. (2020). Exploring the roles of smart services in Chinese senior tourists' travel experiences: an application of psychological reactance theory. *Anatolia*, 31(4), 666–669. <https://doi.org/10.1080/13032917.2020.1742750>
- Zhang, Y., Sotiriadis, M., & Shen, S. (2022). Investigating the Impact of Smart Tourism Technologies on Tourists' Experiences. *Sustainability*, 14(5), 3048. <https://doi.org/10.3390/su14053048>

ORCID

Conceição Ribeiro  <https://orcid.org/0000-0003-0185-3200>

Carolina Rocha Silva  <https://orcid.org/0000-0003-3823-2387>

Paula Serdeira Azevedo  <https://orcid.org/0000-0002-0775-5604>

Manuela Pires Rosa  <https://orcid.org/0000-0001-5017-6408>

Notes on contributors

Conceição Ribeiro has a PhD in Statistics and Operations Research, University of Lisbon, Portugal, 2013. MSc. in Statistics and Operations Research, University of Lisbon, Portugal, 2001. BSc. in Mathematics - Probability and Statistics, University of Évora, Portugal, 1996. Member of the Centre for Statistics and its Applications of the University of Lisbon (CEAUL). Adjunct Professor of the Institute of Engineering (ISE) of the University of Algarve (UAlg). Participant

in the Erasmus+ Project “Learn+ Building communities of teachers producers to implement personalized learning of mathematics supported by machine learning and block chain to assess competences” 2019-2022.

Carolina Rocha Silva has a degree in General Studies from the University of Lisbon, a post-graduation in Political Science and International Relations from NOVA University Lisbon and a post-graduation in Sustainable Cities from the University of Algarve. In 2021, she completed a Research Integration Internship, with the focus on Smart Tourism, at CINTURS - Research Centre for Tourism, Sustainability and Well-being.

Paula Serdeira Azevedo holds a PhD in Management from the Economy Faculty of Algarve University. The research centered on Information Systems (Integrated Business Management Applications). She also holds an MSc in Business and Economy Sciences from the Economy Faculty of Algarve University. She is an Associate Professor at the University of the Algarve since 1997. She combines the scientific area of Information Systems and Information Technology of School of Management, Hospitality and Tourism.

Manuela Pires Rosa graduated in Civil Engineering in 1984 (IST), she achieved an M.Sc. in the Renovation of Architectural and Landscape Heritage in 1995 (Évora University) and a Ph.D. in Spatial Planning and Environmental Strategies in 2004 (University of Sevilla – Spain). She is a Coordinator Professor at the Institute of Engineering - University of Algarve, where she lectures on Sustainable Cities, Mobility and Accessibility. She coordinated the Research Project ACCES4ALL - Accessibility for all in Tourism.