

40 Hospitality Industry and Innovative technology for People with disabilities: the case of the island of Rhodes, Greece

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40.1 Abstract

Tourism is a rapidly growing industry in the world and people with disabilities are becoming a growing group of consumers of travel in recent years.

Disability is a complex and multidimensional phenomenon. The medical approach stated that “disability associated with the loss, damage or deviation from the “normal”, psychological, motor and biological functions of the human body”.

However, the physical environment that related to the hotel services for disabled customers is still limited and undeveloped either in the design, research and proper implementation.

Although the number of consumers who would benefit from accessible facilities and services are on the increment, most hotel managers have still not yet recognized the importance of taking action on this issue. The innovation technology and service design will develop to assist hospitality operations management skills, necessary to operate the hotel staff, communication, architectural facilities and customers. There are certain things that people with disabilities simply cannot do for themselves. But, if they can use an innovation app, they have a high degree of independence on their holidays.

This paper focuses on a) the analysis of the innovation technology and service design in hotel industry, b) the capability of the installation of the innovative technology in hotels and c) the enrichment of tourism product by adopting innovation technology for disabled customers. The primary research and the data collection was implementing in Rhodes, Greece in several hotel enterprises. Structured questionnaires were distributed to hotel managers and organizations for disabled people.

In conclusion, the innovation technology for disabled people in hotels must be a priority. In fact, tourism is a social right for people with disabilities.

40.2 Keywords:

Tourism, hotel industry, innovative technology, accessible facilities, disabled customers.

40.3 Introduction

The development of technology is rapidly evolving, shaping a specific context in the operation and dynamics of hotels. New machines and innovations provide customer service and upgrading travel experience.

The use of new technologies that record information, combine, process and combine it, is an appropriate tool for many actions, and in particular for an economically profitable, globalized and flowing economy such as tourism. New sales concepts are being created, new markets are opened and new products are marketed, pricing policies are changing and consumer needs are constantly increasing (Buhalis, Costa, 2006:137).

The development of technology and, in particular, the speed of dissemination of information and communications, led to a revolution of information and the elimination of space and time. The material and digital world traditionally compete and try to avoid the disadvantages or imitate the advantages of the opponent. As a result, a digital animated environment, composed of cultural influences from around the globe, emerges.

The increased interaction of cultures through increased travel, tourism and the development of media allow the tourist to get to know and absorb new ideas and experiences from a variety of sources in various fields such as music, food, fashion, sports, Literature and cinema. In return, these cultural interactions encourage the diffusion of national borders and change perceptions such as space and time.

According to Erdly & Kesterson (2003), the two forces shaping changes in the tourism industry are globalization and technology. Firstly, globalization characterized by the internationalization of economies, the abolition of borders and the democratization of culture and information, allows and inspires more people to travel to places with services that have previously been inconceivable. Secondly, technological achievements, absolute access to information, the convenient and almost instantaneous nature of telecommunications, as well as advances in science and medicine, fuel economic growth and allow hotel enterprises to cope with the tourist demand of their consumers.

The conceptual approach of the term "technology" refers to two specific cases. The first case describes the process of creating the object, while the second case refers to high technology, how far a product can be technologically advanced. Therefore, technology can be considered both a computer and a corkscrew.

Essentially, there are two types of technology, finding and discovering. The "find" word refers to the creation of a new object, while the word "discovery" refers to finding something that existed before.

The areas in which technology is divided are countless, the main ones being Engineering, Industry, Information and Communication, Applied Sciences, Military Technology, Health and Safety, Transport and the latest technology is Domestic.

A key factor in the evolution of technology is man. Wanting to simplify his everyday life, he gave boost to the realization of technological discoveries and inventions that led him to technological development. The main incentives on which it relied are as follows:

- The exploitation of natural resources and raw materials to the maximum, thus creating new sources of energy, for example water, gas and oil.
- Freedom of communication, creating both the telephone and the internet.

- The use of production equipment to facilitate the workplace, but also the creation of larger and more complex machines, e.g. modern machines at the hotel's production and dining areas.

The first appearance of technological innovation in hotels took place in 1970 with the introduction of refrigerators and ice maker machines in the guest rooms for personal use.

In 1972, telephone sets were added to the room service via a central telephone system and a separate device in each room.

In 1975, color televisions and air-conditioning in the bedrooms make their appearance, creating a space that is more intimate for visitors and more relaxing.

In 1982, satellite TV was installed. The first satellite TV broadcasting in a hotel room is now a fact, enabling the customer to have daily global updates.

In 1986, the first satellite film directories are displayed in the hotels as well as the messaging service directly to each room's voicemail, thus making the customer aware of any messages instantly and quickly. In the same year, electronic locks and electronic key cards appeared in the hotel rooms.

1990 the wake-up call system and the safety box to protect customers' personal items were launched.

Three years later, the first electronic systems - check-in and check-out procedures - are created to help employees in the reception area, thus gradually eliminating the handwritten process of day-to-day operations.

The year 1995 stands out as a landmark year for the development of technology in hotels as well as in general. The greatest achievement in technology is now a reality with the emergence of the internet. The start is initially made with wired internet sites, and then installing and maintaining a hotel-wide wireless network.

In the coming decades, technology has made tremendous leaps, facilitating people's everyday life, focusing on maximizing leisure time and more specifically in the hotel sector, relaxing customers, and automating all the tasks involved in achieving goals and objectives.

40.4 Installation and application of Innovative Technology in hotels

The high cost of purchasing new technologies for the hotel is a hindrance to many hoteliers. However, the rapid growth of technology "forces" de facto hotels to spend more money on the purchase of modern technology products. This has been instrumental in increasing customer requirements.

The main reasons for making this investment on the side of hoteliers are:

- Reducing production time. New technology applications greatly reduce the time required to achieve a particular job, provide service to more people at the same time.
- Reducing labor costs. The emerging "replacement" of living potential with technologies that offer time savings, reduce the cost of the hotel. In many cases reducing labor cost offers more revenue.

Main advantages of using new-innovative technology in hotels:

- Easy access to information. The internet and modern hotel software - applications, helps customer quickly search for information on any subject, providing better customer service.
- Simplify customer communication. With new-innovative technologies, communication between the hotel and the customer is increasingly simplified. With the continuous development and creation of new communication tools, customer contact with the hotel is handled in minutes even if the distance between the two participants is enormous.
- The speed of service. The new hotel software systems, with fast-check-in procedures - applications or hotel-based applications, etc., provide quick information and solutions to the problems faced by each customer, facilitating the employee's work and reducing service time (www.smallbusiness.chron.com).

There are also disadvantages that emerge - arising from the use of new-innovative technology and are as follows:

- High installation costs. New-innovative technology requires in some cases a high installation cost. New technologies can serve and simplify an employee's work more and more, but on the other hand, the cost of purchasing the equipment or the product is constantly increasing. It should be stressed that the main factor of pricing a product is its importance as well as its demand from the customers.
- Maintenance cost. High cost technology products require continuous scheduled maintenance. Also, depending on the cost of purchasing each machine, there are spare parts for replacing any damaged or poorly maintained parts of the machine. Modern systems require constant updating of their software or even any extensions to improve their performance. Therefore, they may need to be shut down for proper installation of their updates for some time, from a few hours to days. This results in the difficulty of carrying out the work of the department by part of the employees.
- Reducing staff. The rapid increase in the use of machinery in the workplace has resulted in a dramatic reduction in the number of staff in a hotel. Several hotels are increasingly replacing their staff with developed technology mechanisms and personal customer service is greatly reduced (www.utahsip.org).

40.5 Disabled modern Traveler profile

Globalization of markets and the international economy is indissolubly linked to the rapid growth of technology and changes in the provision of tourist services to people with disabilities are remarkable.

Undoubtedly, the proliferation of internet use has caused dramatic global changes in the tourism industry. The ability that has been given over the internet to everyone can always have on screen any available information; change its requirements and behavior. Thus potential candidates - potential disabled tourists have the opportunity to find their own tourist destination, to shape their holiday schedule as they wish, based on their personal desires and interests, and to compare prices from different possible websites (Mills, J.E., Han, J-H. and Clay, J.M., 2008:28-41).

It has been shown that detailed information and images on touristic websites play a key role in the customer's view of product quality. A disabled traveler due to technological

developments now has access to more information. Only by pressing a button can easily navigate the disabled modern traveler to different destinations, compare prices and provide services, plan even on vacation. In fact there are 5 stages of the "travel cycle" through the search engine "Google", describing the profile of "modern disabled traveler" (UNWTO, 2011:7-8):

- Dreaming
- Researching
- Booking
- Experiencing
- Sharing

The internet has emerged today from the mainstream media, inspiration and search for tourism information. So instead of "word of mouth" information being pumped, they are pumped from the mouth to mouth or word-of-click (Ray, N.M. and Ryder, M.E., 2003:57-72). In the first phase of the travel cycle, potential disabled tourists search for information for tourism destinations, read blogs, and descriptions of others who have already visited a destination, also watch videos of tourist content and search for or follow a variety of other sources and information.

When the consumer is ready to go through the dream at the stage of researching, he has come up with specific choices and at this stage he carries out detailed and meticulous searches around his choices and spends several hours searching, comparing and rejecting. This is one of the most intense steps in the cycle, as the number of websites explored before a reservation is particularly high. At the same time, the use of mobile phones has increased rapidly and their presence is strong at this stage.

The next step after the thorough search is to make the reservation of the final consumer choice. Internet and mobile phone booking of airline, hotel and all kinds of tourist services are on the increase. Particularly in mobile phone bookings, a major and crucial factor in making a reservation is the new "click to call" application.

The stage of experience is the result of the dream chain, searches and reservations. During the trip, the disabled tourist does not stop searching and booking for excursions, restaurants and car rental. With the help of new technology and in particular of personal mobile computers, mobile phones and tablets, he searches and makes reservations for all sorts of tourist services. The ability of the tourist of an all-rounder and personal local informant is invaluable and easy with the integration of modern technology.

At the end of his journey and his cycle, the person shares his experiences with the rest of the world by communicating them to the internet. But the dreams of someone else are inspired through these notifications, so the travel cycle continues therefore tourism.

40.6 Providing hospitality services to the Disabled Traveler

Disability is a complex and multidimensional phenomenon. The medical approach, which until a few years ago was the predominant one, stipulated that "disability is related to the loss, damage or deviation from the" physiological ", psychological, kinetic and biological functions of the human body. In reality, however, disability has to do with the gap between the individual's capacities and the demands of society; the gap in the needs of disability and the structures of society, whose design did not predict the potential and needs of this social group (Bi, Card, Cole, 2007:205-216). The more severe the form of disability is, the greater

the "inaccessibility" and therefore the social exclusion experienced by the disabled person (Simon, D., Pheroza, S. (1999:41-47).

In the context of the global tourism industry, the design and adaptation of the premises of most accommodation for disabled customers is a priority and one of the basic prerequisites for tourism development. In fact, tourism is a social right of all people with disabilities.

According to the Eurostat (2012), the number of people with disabilities in Europe is 50.000.000, which at least 50% travel with an average of 1,56 people, increasing the number to 89.000.000 people. There is also many people with disabilities who are not on holiday due to their disability, which is considered the main obstacle to access to many of the existing tourism services (ec.europa.eu/eurostat).

According to Eurostat data, the percentage of people with disabilities in the countries of E.U. are as follows:

Table 1. Percentage distribution of People with Disabilities by country in the EU

Rank	Country	Percentage distribution of people %
1	Denmark	18,2%
2	Grade Britain	17,8%
3	Hungary	17,0%
4	Germany	16,9%
5	Netherlands	16,2%
22	Greece	9,1%
27	Czech Republic	7,6%
28	Italy	6,1%

Source: Eurostat (2012).

40.7 Innovative applications tailored to the needs of People with Disabilities

Achieving the goals of effectively serving people with disabilities depends to a large extent on the use of new innovative applications where they facilitate their daily stay in the hotel. Some of the new innovative applications for people with disabilities are as follows:

40.7.1 Electronic Obstruction Detector for Visually Impaired Persons

The Obstacle Detector uses the new technology to help visually impaired people. It is an advanced rattan technology that can be used by visually impaired people. It includes a mechanism that consists of a sensor that detects high obstacles and alerts the user through a buzzer for an obstacle, as well as a pulse motor that alerts the user if the environment in which it is moving has noise (ekinisilab-sev.gr/omades-ekinisilab/).

The comparative advantage over the visually impaired is that the obstacle detector can detect high obstacles, something that is in need, but there is no solution so far.

40.7.2 Smart Home for People with Disabilities

This feature refers to homes, hospitals and hotels that have devices that can communicate with each other and controlled by remote control or PC from anywhere in the room, at home or even in the world, using the internet or the mobile phone.

Abroad, and especially in the Scandinavian countries, the state is particularly sensitized about people who have difficulties or a disability. It should be noted that there are state funding to hoteliers who want to adapt their rooms to their individual needs. Smart Home is appearing in many foreign hotels, helping people with disabilities to cope better with their daily lives while offering more relaxing vacations.

However, there is neither information nor state benefits in Greece to support some people's diversity. Small units as well as Greek hotel owners will hardly concentrate on something similar. The only exception is the Holiday Inn Athens Hotel, member of the Holiday Inn hotel chain.

More specifically, all electrical devices can operate and operate by telephone (by sending a message to lock a door, to turn the lights on to the hotel room, to adjust the room temperature, etc.), a remote control even with voice commands. Also, the system can work independently, for example, if there is air in the room through open windows, the system will close the curtains or windows automatically. When a window is left open or an unlocked door the audible alarm system informs the people.

For hearing impaired people, the room is equipped with bright lights, informing them about problems in the room, for example if someone knocks the door lights a white light if the phone rings green light while if a door is unlocked unlocking lights up red light.

As far as people with limited vision or blindness are concerned, the system's control system has the Braille system as well as the voice commands already mentioned (www.blog.appleworldhellas.com).

40.7.3 “Handimap” Application for People with Disabilities

"Handimap" application aims to map cities in France to easily locate areas with disability-friendly infrastructure. With the mobile app that comes with them, the maps allow users to accurately locate the city's parking spots, relax in open spaces such as parks and visit museums and other tourist spots with access to people with disabilities.

Platforms also identify pavements that are accessible to people with a wheelchair. So far, Handimaps are available for the Rennes and Montpellier regions, and others will follow.

This innovative service was presented in the international exhibition “ITB Innovators: Platform for the tourism trends of tomorrow” (Tourism with people with disabilities).

40.7.4 The international accessibility certification "Hotel Accessibility Pass"

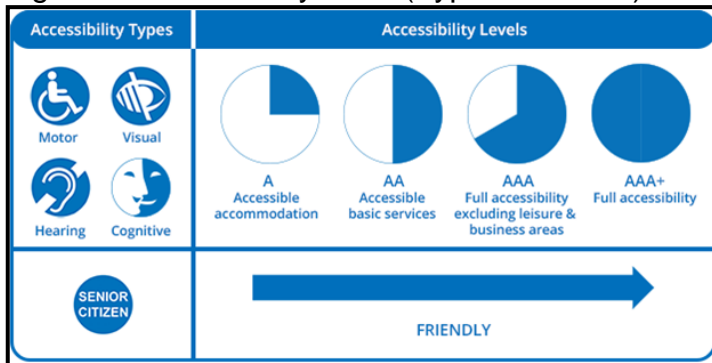
Several hotels want to assess the level of services they provide to disabled customers. Therefore, they must independently carry out an independent assessment of their installations by specialists.

Undoubtedly, knowledge and understanding of the needs faced by these customers will be highly appreciated by themselves, which in many cases will become direct advertisers of the

hotel in their special clubs and communities as well as in their wider social circle; Which will pave the way for a market with enormous dynamics.

Accessibility Pass is an international certification of hotel infrastructure and services for accessibility of all categories of disabled people (separate accessibility marks for people with motor, visual, acoustic or mental disabilities, for the elderly, etc.) as well as the skills of the human resources (Figure 1).

Figure 1. Accessibility Pass (Types & Levels)



Source: lh5.ggpht.com

It is a Greek innovation, with composition, but by evaluations and criteria of 18 organizations from 9 countries. Its goal is to provide useful and reliable information on the accessibility of certified hotels so that people with accessibility needs can easily choose a hotel that caters to their own personal needs (Figure 2). Therefore, an extensive list of criteria is used to determine the accessibility level of a hotel for people with mobility, sight, hearing, and mental illness, and for the elderly.

More specifically, real data on infrastructure, services and staff skills are collected, hotels are ranked according to their accessibility, certified accessibility labels for accessible hotels are published, and information on hotel accessibility is published to internet. The classification of hotels by Accessibility Pass is objective, thanks to the use of common criteria for all hotels in the world and the mapping of hotels by Approved Inspectors - not based on hotel self-declaration. Staff skills are developed through the formal education program and are secured through tests that lead to employee certification.

The Accessibility Pass certification scheme has been developed by CERTH (Centre for Research & Technology Hellas) / HIT (Hellenic Institute of Transport), through collaborations with international accessibility experts and the cooperation of senior citizens. It is also controlled and supported by the ACCESSIBILITY PASS Executive Council, which is composed of Experts, Scientists and Researchers from the international community. Accessibility Pass has the approval and support of agencies and organizations internationally, who are specialists in accessibility issues and are members of the European Network for Accessible Tourism (ENAT).

Figure 2. Accessibility Pass Certification Scheme



Source: www.peoplecert.org

The adoption of new innovative applications by several hotel enterprises is crucial for increasing the benefits and revenues of these companies. The following statistics reinforce this position:

- At 1.000.000.000, based on international surveys (World Health Organization and O.E.C.D.), people with disabilities, that is, 15% of the world's population, are estimated.
- 800.000.000 people are estimated, over 60 years old, which is 12% of the world's population.
- If their escorts are included, this number increases significantly, reaching 2.200.000.000, which is 33% of the world's population.

A general assessment is that approximately 780 million travels bring to the European economy 400 billion euro's per year. If the tourism destinations and hotels were fully accessible (infrastructure + staff) we would have an increase of 35% of tourist revenue. So, an additional of 140 billion euro's per year in the European economy.

40.8 Research Methodology

The survey took place from 05/10/2016 to 20/10/2016, on the island of Rhodes, Greece, and took part in hotel managers as well as people with disabilities of local organizations.

As a data collection tool, the questionnaire with structured questions was selected, while stratified disproportionate sampling was used.

A total of 97 questionnaires were collected from 276 hotels five stars (5 *) (39 Hotels), four star hotels (4 *) (107 hotels) and three star hotels (3 *) (130 Hotels) and 63 questionnaires from 372 people with disabilities (232 men and 140 women) of local organizations in Rhodes. The sample is representative of the research population. More specifically, the distribution of the survey sample is as follows (Table 2):

Table 2. Research data

Data	Description	Total hotels (Reference population)	Hotels (Sample)	Percentage distribution Sample %
Hotels	5* Hotel	39	26	26,80%
	4* Hotel	107	43	44,33%
	3* Hotel	130	28	28,87%
	Total	276	97	100%
People with Disabilities	Description	Total Disabled (Reference population)	People with Disabilities (Sample)	Percentage distribution Sample %
	Man	232	51	80,95%
	Woman	140	12	19,05%
	Total	372	63	100%

The specific characteristics of people with disabilities in the sample of research are as follows:

- In terms of sex, 80,95% of people with disabilities are men, while 19,05% are women.
- 31,75% of the sample is 40-49 years old, 28,57% are 30-39 years old, 17,46% are 50 years of age or older, 15,87% are 18-29 years old, while only 6,35% of the sample is under 18 years old.
- The main disability categories are 73,01% of physical disability, 19,0% of sensory impairment and 7,94% refers to non-visible disabilities.
- Regarding to the marital status, 52,38% of the disabled people in the sample are married, while 47,62% are single.
- 68,25% are graduates of secondary education, 20,64% are graduates of tertiary education, 11,11% have completed postgraduate studies.

40.9 Case Study: Rhodes Island

Rhodes is one of the most popular travel destinations for a summer holidays in Greece, since it has a large number of hotels. On the island there are many hotels of all categories (Table 3), seaside hotel resorts located in the most beautiful seaside areas as well as a large number of tourist accommodation enterprises (approximately 800 hotels, apartments, etc.). The seaside hotels as well as the other hotels in Rhodes are generally at the most popular holiday spots such as Rhodes Town, Faliraki, Kolympia, Archangelos, Lindos, Pefki, Ixia, etc. They are located mainly on the east coast and provide very good amenities and excellent service.

	5*	4*	3*	2*	1*	Total
Hotels	39	107	130	157	45	478
Rooms	9.895	18.702	7.911	6.559	890	43.957
Beds	20.450	36.078	15.229	12.382	1.717	85.856

Table 3. Hotels in Rhodes (2016)
Source: Hellenic Chamber of Hotels (2016)

40.10 Results

The results of the survey are divided into those that emerged from the responses of the hotel managers as well as those that emerged from the responses of the disabled people of local organizations on the island.

40.10.1 Survey results (Hotels of Rhodes)

This section presents the results of research related to hotels of Rhodes. More specifically, table 4 below refers to hotels of the research that are accessible to people with disabilities.

Hotel Category	Accessible Hotels for People with Disabilities		Non Accessible Hotels for People with Disabilities	
	Frequency (Hotels)	Percentage distribution %	Frequency (Hotels)	Percentage distribution %
5*	26	26,80%	0	0%
4*	39	40,21%	4	4,12%
3*	20	20,62%	8	8,25%
Total	85	87,63%	12	12,37%

Table 4. Accessible Hotels for People with Disabilities

Specifically, in Table 4 we note that 87,63% of our sample hotels are accessible to the Disabled and only 12,37% of all sample hotels are not accessible to the Disabled. It is worth mentioning that all hotels of the sample are resort hotels with vast areas of accommodation and dining.

Table 5 below shows the number of appropriately configured rooms for the disabled.

Rooms per Hotel	Frequency (Hotels)	Percentage distribution %	Total Rooms for People with Disabilities
4	10	10,31%	40
3	32	32,99%	96
2	35	36,08%	70
1	8	8,25%	8
0	12	12,37%	0
Total	97	100%	214

Table 5. Rooms for People with Disabilities per hotel

More specifically, we note that 36,08% of the hotel sample features 2 rooms for people with disabilities, while 32.99% of the sample features 3 rooms. Of the 4 rooms for people with disabilities, 10,31% of the hotel sample, while only one room features 8,25% of the hotels. A general estimation of the capacity of these hotels in relation to the availability of rooms for

people with disabilities is that the number of rooms available is considered satisfactory (214 hotel rooms) although it could have been larger in order to cover increased needs during the high season.

Table 6 below shows services for disabled people available from hotels in the sample. More specifically, 87,63% of the sample hotels provide disabled rooms as well as accessible public areas. 80.41% provide Braille elevators signage for visually impaired customers, while 59.79% of the sample provides audiovisual material in rooms for the disabled. Also, 35.05% of the sample hotels stated that they provide services for people with disabilities in leisure facilities (e.g. children's playground accessible to people with disabilities, swimming pool, etc.) and food and beverage department (menu list of large font, etc.).

Table 6. Provided services per hotel for People with Disabilities

Provided services for People with Disabilities	Frequency (Hotels)	Percentage distribution %
Rooms for People with Disabilities	85	87,63%
Accessible areas	85	87,63%
Elevators Braille Signage	78	80,41%
Audio-visual information in the rooms for People with Disabilities	58	59,79%
Other accessible services for People with Disabilities	34	35,05%

Table 7 below shows the innovative hotel services available to people with disabilities during their holidays.

An innovative implementation has been implemented - for People with Disabilities			An innovative implementation has not been implemented - for People with Disabilities
12		Percentage Distribution %	85
Hotel Website with digital material accessible to People with Disabilities	12	12,37%	-
Information for accessible areas for People with Disabilities in Rhodes	9	9,28%	-
Access for the People with Disabilities to the beach of the hotel using the appropriate equipment	8	8,25%	-
Percentage Distribution %	12,37%		87,63%

Table 7. Innovative hotel Applications for People with Disabilities

More specifically, we notice that only 12,37% of our sample hotels provide some innovative service-applications to the disabled, while most of the hotels have not adopted any innovative service-applications for people with disabilities. More specifically, 12,37% of the sample hotels have a website with digital content that is accessible to people with disabilities through the internet. Also, 9,28% provides printed material for accessible areas for people with disabilities in Rhodes, while 8,25% provides access to the beach of the hotel with the use of suitable equipment for people with disabilities. It is obvious that a very large percentage of the sample hotels (87.63%) have not adopted any innovative service-applications regarding to disabled customers. The main reasons that make it impossible to install these applications at present are high installation costs and maintenance costs. Table 8 below shows the hotel departments where the hotel manager considers it necessary to install innovative apps-services for people with disabilities.

Hotel Departments	Frequency (Hotels)	Percentage Distribution %
Rooms	97	100%
Booking / Webpage	97	100%
Animation & Sports Areas	84	86,60%
Public Areas	81	83,50%
Front Desk / Reception	74	76,29%

Table 8. Hotel operation areas that it is necessary to install Innovative Applications-Services for People with Disabilities

The absolute percent of the distribution (100%) considers that in the hotel rooms and in the reservation department (including its website) it is necessary to install innovative service-applications for people with disabilities. Also, with the percentage of 86,60%, the animation and sports areas are followed by 83,50% of the public areas of the hotel, while 76,29% is recorded by the Front Desk / Reception.

When asked whether the hotel layout facilitates the installation and implementation of innovative services for the disabled, as well as what hotel managers consider as essential prerequisites for the effective installation and implementation of innovative services for people with disabilities in the hotel, the answers have great interest (Tables 9, 10).

Hotel fitting / installation of Innovative Applications for the Disabled	Frequency (Hotels)	Percentage distribution %
It is possible to install and apply innovative services for People with Disabilities	78	80,41%
It is impossible to install and apply innovative services for People with Disabilities	19	19,59%
Total	97	100%

Table 9. Ability to install Innovative Applications for People with Disabilities in the hotel

Conditions for installing Innovative Applications for People with Disabilities	Frequency (Hotels)	Percentage distribution %
Government subvention & support	95	97,94%
Accessible public areas	94	96,90%
Intention to invest in Disabled People services	86	88,66%
Staff training regarding Disabled Persons' rights	71	73,96%
The change of philosophy towards the servicing of Disabled People in hotels	57	58,76%

Table 10. Basic conditions for the effective installation and implementation of Innovative Services for the Disabled in the hotel

More specifically, we note that 80,41% of the sample hotels believe that the hotel's spatial planning greatly facilitates the installation and implementation of innovative services for the disabled, while 19,59% responded negatively. It is estimated that the large percentage can be justified, since most of the hotels in the sample are resort hotels and their facilities are spread over thousands of square meters.

Regarding the basic conditions for the effective installation and implementation of innovative services for people with disabilities in the hotel, the answers given were the state subsidy (97,94%), the proper fitting of the hotel premises (96,90%), the intention (88,66%), staff training in basic services for disabled people (73,96%) and finally the change of philosophy towards the servicing of disabled people in hotels (58,76%).

The adoption by the hotels of technological innovation for disabled customers will obviously have a positive impact on the hotel operation. According to the results of the survey the main benefits are the attraction of potential disabled customers and their escorts from new markets (97,94%), the increase of the satisfaction of disabled people from the hotel services provided (96,90%), the potential increase in the percentage of individual disablements by disabled persons (84,53%), as well as the possible increase in the percentage of hotel bookings for disabled people (81,44%), the extension of the tourist season (79,38%) and the possible increase of overnight stays and consumption in the various departments (76,29%) (Table 11).

Hotel benefits	Frequency (Hotels)	Percentage distribution %
Attract potential clients and their escorts from new markets	95	97,94%
Increasing the satisfaction of Disabled People from provided services	94	96,90%
Possible increase in individual bookings from Disabled People	82	84,53%
Possible increase in bookings for tourists' packages for People with Disabilities	79	81,44%
Extension of tourist season	77	79,38%
Possible increases in overnight stays and consumption in other departments	74	76,29%
Other benefits	32	32,99%

Table 11. Hotel Benefits from Adoption Technological Innovation for People with Disabilities

According to the results of the survey the benefits for the disabled client from the adoption of the innovative service - applications in hotels are its expected ease in providing hotel services (100%), the feeling of security and care in the increased- (97,94%), as well as the inclusion of the disabled in a particular community, meaning the hotel's clientele (84,53%) (Table 12).

Benefits for Disabled People	Frequency (Hotels)	Percentage distribution%
Facility in terms of provided hotel services	97	100%
Feeling safe and caring for the special needs of Disabled Customers	95	97,94%
Integration of Disabled People into a particular community, the hotel's clientele	82	84,53%
Other benefits	24	24,74%

Table 12. Benefits for Disabled People from Adoption Technological Innovation by hotel

Also, the tourist destination will have a positive impact in attracting disabled customers from different markets. More specifically, the main benefits for the tourist destination are the advertising of the tourist destination (95,88%), the identification of the tourist destination as accessible to the disabled (84,53%), the extension of the tourist season (79,38% %) and finally the possible increase of revenues for the tourism enterprises, etc. (76,29%) (Table 13).

Benefits for the tourist destination	Frequency (Hotels)	Percentage distribution %
Tourist destination advertising	93	95,88%
Identifying a tourist destination as accessible to People with Disabilities	82	84,53%
Extension of tourist season	77	79,38%
Revenue growth for tourism enterprises, etc.	74	76,29%
Other benefits	19	19,59%

Table 13. Benefits of a tourist destination from Adoption Technological Innovation by hotel

40.10.2 Survey results (People with Disabilities)

According to the results of the survey are concerned, as they have emerged from the answers of the disabled people of Rhodes, very interesting findings are apparent. More specifically 38,10% of the survey sample does not go on vacation, 25,40% goes on holidays every 3 years, 19,04% goes to holidays every 2 years, while only 17,46% (Table 14).

I'm not going on a vacation	Every Year	Every 2 years	More than 2 years	Total
24	11	12	16	63
38,10%	17,46%	19,04%	25,40%	100%

Table 14. Vacation Frequency of Disabled People

Regarding to the duration of holidays 56,41% of the sample spends 3-5 nights, 25,64% spends 6-10 nights, 10,25% spends 1-2 nights, while the rest 7,70% spends more than 10 nights at the hotel (Table 15). The majority of people with disabilities are always on their holiday with their escort (89,75%), while only 10,25% are unaccompanied (Table 16).

1-2 room nights	3-5 room nights	6-10 room nights	10+ room nights	Total
4	22	10	3	39
10,25%	56,41%	25,64%	7,70%	100%

Table 15. Duration of holidays for Disabled People

Holidays with escorts	Holidays without escorts	Total
35	4	39
89,75%	10,25%	100%

Table 16. Disabled People escorts during the holidays

A large number of people with disabilities (66,67%) spend an average of 101€ -150€ per day (including accommodation costs), 20,51% spend an average of 151€ -200€, while only 12,82% spends an average of 50€ -100€ (Table 17). As a result, it is clear that holidays for people with disabilities are relatively expensive, if we even consider the economic crisis that exists in Greece.

50€ - 100€	101€ - 150€	151€ - 200€	200€ +	Total
5	26	8	0	39
12,82%	66,67%	20,51%	0%	100%

Table 17. Holiday expenses per day

Table 18 presents the most important accessibility facilities for people with disabilities in order to choose a holiday accommodation. More specifically, the absolute percentage of the survey sample (100%) considers that the hotel should have a central entrance with a ramp, rooms suitable for disabled people (on the ground floor), accessible public areas (catering, etc.) with ramps and special signs, lifts accessible to people with disabilities and also parking spaces for disabled customers.

Also, 87,30% of the sample considers significant the existence of recreational facilities for people with disabilities in the hotel, while 77,78% is the existence of a site appropriately designed for people with disabilities. Finally, 74,60% consider the existence of an accessible reception area (reception, lobby, etc.) in the hotel.

Accessibility facilities in the hotel	Frequency (Hotels)	Percentage distribution %
Main Entrance with a ramp	63	100%
Rooms for Disabled People (on the ground floor)	63	100%
Accessible public areas with ramps and special signs	63	100%
Elevators specially designed and equipped for easy use by such persons and for the blind	63	100%
Parking spaces with proper identification for vehicles of persons with reduced mobility	63	100%
Animation & Sports Areas for Disabled People	55	87,30%
Booking / Webpage	49	77,78%
Front Desk / Reception	47	74,60%

Table 18. Accessibility facilities for the Disabled

Table 19 below shows the hotel's operating departments, where it is considered necessary for the disabled to install innovative service-applications for people with disabilities in the hotel.

Hotel function departments	Frequency (Hotels)	Percentage distribution %
Rooms	63	100%
Public areas	63	100%
Bookings / Webpage	60	95,24%
Animation & Sports Areas	59	93,65%
Front Desk / Reception	55	87,30%

Table 19. Hotel Segments where it is necessary to install Innovative Services for the Disabled

The absolute percentage of the sample of the survey (100%) considers that in the rooms as well as in the public areas of the hotel it is necessary to install innovative service-applications for people with disabilities. Also, 95,24% follows the hotel booking department of the hotel (including its website), 93,65% animation & sports areas, and 87,30% is the front desk / reception area.

Table 20 below presents the viewpoint of people with disabilities regarding the importance of adopting innovative service-applications for people with disabilities in a hotel, depending on the choice of a particular hotel. More specifically, in all responses, 68,26% considers it important to very important the adoption of innovative service-applications for people with disabilities in a hotel. The 22,22% figure does not seem to be directly influenced by the choice of a hotel, while 9,52% of the survey sample does not consider the innovative apps-services for the disabled to be very important in order to choose a particular accommodation for holidays.

	Extremely Insignificant	Insignificant	Quite Important	Important	Very Important
Selection of accommodation due to the availability of innovative service-applications for People with Disabilities	0	6	14	35	8

Table 20. Selection importance of accommodation due to the availability of Innovative Service-Applications for People with Disabilities

Regarding the basic prerequisites for the effective installation and implementation of innovative services for people with disabilities in the hotel, the responses given by the Disabled persons concerned the change of philosophy regarding the servicing of disabled people in hotel enterprises (100%), the staff training in the basic principles of service (93,65%), the appropriate knowledge for the effective implementation (92,06%), the proper fitting of the hotel premises (74,60%) and the government subvention (71,43% %) (Table 21).

Conditions for installing innovative applications for People with Disabilities	Frequency (Hotels)	Percentage distribution %
The change of philosophy towards the servicing of Disabled People in hotel enterprises	63	100%
Staff training regarding Disabled Persons' rights	59	93,65%
Appropriate knowledge for effective implementation by People with Disabilities	58	92,06%
Accessible public areas	47	74,60%
Government subvention & support	45	71,43%

Table 21. Basic conditions for the effective installation and implementation of Innovative Services for the Disabled in the hotel

According to the results of the survey, the benefits for the disabled customer from the adoption of the hotel's innovative service-applications, are its expected ease in providing hotel services (100%), the feeling of safety and care in the increased personal needs of disabled customer (100%), as well as the high satisfaction rate of the hotel's services (95.24%) (Table 22).

Benefits for Disabled People	Frequency (Hotels)	Percentage distribution %
Facility in terms of hotel services provided	63	100%
Feeling safe and caring for the special needs of Disabled Customers	63	100%
Satisfaction from the hotel's services	60	95,24%
Other benefits	19	30,16%

Table 22. Benefits for Disabled People from Adoption Technological Innovation from the hotel

Also, according to the respondents' answers, the tourist destination will have a positive impact in attracting disabled customers from different markets. More specifically, the main benefits for the tourist destination are the identification of the tourist destination as accessible to the disabled (96,83%), the tourist destination advertising (95,24%), the extension of the tourist season (77,78% %) and finally the possible revenue growth for tourism enterprises, etc.(76,19%) (Table 23).

Benefits for the tourist destination	Frequency (Hotels)	Percentage distribution %
Identifying a tourist destination as accessible to People with Disabilities	61	96,83%
Tourist destination advertising	60	95,24%
Extension of tourist season	49	77,78%
Revenue growth for tourism enterprises, etc.	48	76,19%
Other benefits	17	26,98%

Table 23. Benefits of a tourist destination from Adoption Technological Innovation from the hotel

40.11 Conclusions

Undoubtedly in the global tourism industry, the design and adaptation of the premises of most accommodation for disabled customers is a priority and one of the basic prerequisites for tourism development.

Achieving the objectives for the effective service of disabled people depends to a large extent on the use of innovative service-applications that facilitate their daily stay in the hotel and at the destination of their vacation.

According to the results of the survey, most hotels in Rhodes are accessible to people with disabilities, according to the required specifications, but are lagging behind in adopting innovative applications-services for that particular customer market. The main reason for this is the lack of government subsidy for the specific investment activities, as well as the inadequacy in the layout of the hotel enterprises premises. It is reasonable that the government in the current period, due to the financial crisis, cannot afford financially to such proposed investments. However, under certain conditions, this can be done by private initiative.

The adoption of innovative applications-services by hotel enterprises would be able to create the conditions for the systematic and methodical promotion of Rhodes as an accessible holiday destination for people with disabilities. In fact, it could be a first step in trying to extend the tourist season and bring great economic benefits and international visibility to the island.

The enormous advertising of Rhodes will strengthen its image as a tourist destination and will contribute to the further development of many special forms of tourism (thermal tourism, medical tourism, etc.), increased financial investment in new technologies as well as other investment activities.

Increasing the market share of people with disabilities in Rhodes will significantly boost the revenues of hotels and other tourism enterprises. As a result, the travel of disabled people and their escorts can be a very important potential tourist market for the benefit of tourism enterprises and service enterprises, while enhancing the development of Rhodes and the Greek economy.

We conclude that the challenge of providing high-quality services to people with disabilities by hotels is great and becomes even greater when the size and value of the offer to that particular customer market is perceived.

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