

## Sustainable Solutions in the Hospitality Industry and Competitiveness Context of “Green Hotels”

Tamara Floričić<sup>a\*</sup>

<sup>a</sup> *Juraj Dobrila University of Pula, Faculty of Economics and Tourism “Dr. Mijo Mirkovic”, 52100 Pula, Croatia.*

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### Abstract

This interdisciplinary paper researches the importance of sustainable hotel engineering and organisation of facilities for the purposes of realisation of a sustainable and responsible hospitality facility business. Considered through the interdisciplinary aspect, at the same time, it represents a research goal with the focus on the segment of youth tourists, who, as existing consumers of low-budget expenditure, are turning into DINKY, as well as the segment of conscious adult consumers in the future. The paper, through a questionnaire, researches the perception of the importance of resource management, with the implementation of innovative technologies by youth tourists' related attitudes and experiences. The methodology is based predominantly on qualitative research methods and includes analysis and conceptual methodology and survey research methods of youth tourists' attitudes. The quantitative research was processed by using the statistical methodology combined with techniques of creative thinking formation. The results point to the predominance of importance in which over 90% of respondents confirm the importance of sustainable initiatives and resource management with the following rank: food, water, energy, and waste management. Further analysis implies an opposite attitude where only 52.9% of participants would be willing to pay higher prices for sustainable solutions in hotels. The results and recommendations contribute to knowledge and ideas by recognizing competitiveness of hotels, which design and engineer the business system and operations with support of sustainable technologies in an interdisciplinary way. The paper also contributes to the comprehension of combined and successfully communicated economic and marketing values of sustainable innovations supported by digital technologies.

*Keywords:* Sustainability; Resources; Architecture and Design; Hospitality Industry; Youth Tourism Segment.

### 1. Introduction

Hotel planning, engineering and construction under the concept of sustainable development is the ultimate goal of responsible national tourism destination strategies. In the past 70 or so years, due to the expansion of tourist travel and development of mass tourism, numerous hotels were constructed for accommodation of the rapidly growing number of tourists. Mass tourism hospitality is characterised by uniformity, service standard and compatibility between structures and standards and selected categories and types. Differentiation is almost non-existent which, at the end of the last century, with the rise of awareness about man's responsibility towards the environment, from the ecological, economic and social aspects, was detected as a limiting competitiveness factor. Namely, by the development of technology and society, personal attitudes and demand trends change, and consumers become increasingly aware of their individualism, i.e. they recognise the importance of personal needs and motives. Tourism economics transforms, tourism niches are differentiated [1] and, in their system, an environmental, social and economically responsible

\* Corresponding author: [tfloricic@unipu.hr](mailto:tfloricic@unipu.hr)

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consumer is recognised who, through his tourist stay, wishes to affirm his values.

On the other hand, by the development of technology, advantages are recognised of innovative solutions which affect savings of resources and energy sources in hotels and they become the subject of research, innovations and implementation in the hotel industry. Čerović and Čomić (2011) and Dastbaz and Strange (2015) [2, 3] differentiate various possibilities of savings and responsible management, realised through the prism of sustainability. They include management of resources, energy sources, management of water resources, electricity and waste management, where special innovations stand out in the area of food waste management [4, 5]. Besides the afore stated, Wong et al. (2015) [6] stresses the impacts on environmental protection, claiming that green solutions can be realised both in indoor and outdoor hotel facilities [7] for example, through "green roofs or living walls", due to which there is a kind of synonym for modern hospitality, but also best practice benchmarking.

The topic area is associated with the activities of conceptual design, planning, construction and making the constructed facility operationally functional. Urban conditions, architecture and construction materials are linked with the key postulates of Urban Engineering. Construction of a modern facility to suit a responsible and environmentally aware consumer, integrated in natural surroundings and attraction base is the goal towards which numerous architects strive, combining professional aspects, functionality and design [8]. Architecture and engineering for the needs of tourism is becoming a specialised field of research by many scientists and experts, given the specific qualities and propulsive requirements and trends of the demand market [9].

The paper analyses and emphasises the importance of planning of hotel accommodation structures in accordance with the concept of sustainability but, at the same time, it focuses on competitiveness, evaluated by attitudes and perceptions of the consumer segment. For the purposes of consideration of the problem area, the paper presents the theory and literature review as a platform for the research of the aspects which explain the correlation of the efficient planning and formation of the hotel accommodation facility. The research deals with the questions of competitiveness which it considers through a qualitative and quantitative research of the youth segment of tourism demand, which was recognised and chosen, as youth represents the group of future consumers with a tendency towards a budget increase. The economic effectiveness of particular innovative sustainable solutions of entrepreneurship venture has not been considered in this paper, as it is recognised as an important question, i.e. a theme for future research.

Further to the research goal and purpose, the main and the auxiliary hypotheses are set:

H0 Tourism demand of the future appreciates corporate responsibility and resources management and predominantly chooses sustainable hotels

H1 The tourist demand preferences of sustainable solutions and evaluated benefits of sustainable solutions present the incentive to the technological and engineering companies to pursue new advancements and innovations.

Besides the introduction section, the structure of the paper also includes, in the second chapter, a theory and literature review that refers to the main aspects of sustainability in the hospitality industry of the future. That includes the evaluation of technological solutions as well as design of services and facilities in a sustainable way. The third chapter presents materials, and the research design in steps, which produced indicative results presented and discussed in the fourth chapter. The paper ends with a conclusion followed by acknowledgement, funding, conflict of interest, bibliography and a references section.

## **2. Sustainable Hospitality Industry – Theory and Literature Review**

Green building or construction emerged as a part of the green movement which, in many countries, has become increasingly topical. An increasingly rigorous legal framework speaks of its merit, as well as a higher level of ecological awareness, especially following the conference in Rio de Janeiro and adoption of Agenda 21, which defined the main pillars of sustainable tourism. Sustainable tourism emerged as a balance for mass tourism which is consumer oriented and unsustainable, whose only goal is profit and its realisation to the detriment of the environment and local community tradition. To develop tourism in a sustainable way, or observing sustainable development criteria, means to ensure benefits for the local population, both in the social and economic senses. It is, however, essential to avoid all long-term damage and pollution in the social and physical environments on one hand and to maintain competitiveness and prosperity of the specific economy sector, on which depends overall economic gain, on the other. Sustainable development of hospitality within tourism needs to put its accent on the optimal use of resources which make the key element of tourism development, respect the socio-cultural authenticity of the local community and ensure a long-term economic activity for the benefit of groups of stakeholders who have substantial influence.

### **2.1. Defining a Hotel for the Tourism of the Future**

The platform for sustainable hospitality greenfield investment is sustainable energy and ecologically sustainable construction which gravitates towards: reduction of the heat loss from buildings, improvement of thermal insulation of

the external elements and a favourable ratio between the building surface area and volume, increase in thermal gains in the building by means of a favourable building orientation and by use of solar energy, use of renewable energy sources in buildings (biomass, sun, wind) and increase in energy efficiency of thermo-energetic systems [10]. The design of sustainable hotels affects the improvement of health of their visitors, given that they have more natural light and fresh air. Green building includes "use of renewable energy sources, sustainable and recycled materials, quality of the environment, people's health and comfort, ecological waste management, transport and many other parameters". Bašić (2015) [11] points out that, among them, energy efficiency takes merely one, but certainly a significant, place as, out of all the harmful impacts of the construction itself on the environment, here it concerns potentially the greatest ecological impact. In construction of sustainable hotels, renewable construction materials are used as much as possible, which means that use of energy-intensive systems, ecologically harmful programmes, unnecessary waste generation and use of dangerous substances is avoided. The functionality of the building itself is maximally adapted for the local climate and most of the materials and resources used in its construction can be recycled.

An important prerequisite for the implementation of sustainability hospitality are both daily operation and technologically innovative equipment and its maintenance. It should be emphasised that this business concept increases profitability and provides a differentiated tourist offer whose demand has been growing from year to year and affects tourism overnights [12]. An already constructed hospitality facility can be converted but, if that action is taken at the very beginning, considerable economic benefits are achieved in the future [13].

Sustainability labels and international certificates, of which Travelife, Eu Ecolabel, Sustainable Hotel and Green Key are the best known, are voluntary instruments of environmental protection with which caterers demonstrate that they take care of the environment in the way that they respect the environmental protection standards and do even more to that end than is proscribed by the legal minimum. Labels and certificates are in accordance with the international policy of sustainable production and consumption, whose end goal is to reduce the negative impact of production and consumption on the environment, health, climate and natural resources and to encourage socially responsible business practices and sustainable lifestyles [14]. According to OMH [15] it is expected that an aware consumer will rather choose a product or service with a label which proves ecological awareness. The advantage of having sustainability ecolabels shows that "a hotel demonstrates and proves a high level of quality and care for the environment, reduces water and electricity consumption and the quantity of waste and leads to reduction of costs, as opting for environmental protection means healthy accommodation, healthy nutrition and a healthy environment for both guests and employees, directly affecting their satisfaction and contributing to a better service quality, strengthening the market position and distinguishing the facilities which have this label from others".

The hospitality economic valorisation is made by consideration of business performance using a series of indicators and its success depends on marketing strategies of the hotel product, innovations and technology [18, 19]. Resource management means efficient and effective implementation of organisational resources when there is a need for them and they are financial resources, inventory, human skills, production resources and information technology. The concept of responsible management means that management needs to be in accordance with the regulations and the law, but also in accordance with the ecological standards [20]. Numerous authors have studied and analysed sustainable concepts, for example management of energy sources and water research in Mensah (2019) and Webster (2016) study, who explored the environmental impact of the hospitality industry and discussed savings potential [21, 22]. Waste management is the topic that Chaabane et al. (2019) and Legrand et al. (2016) elaborate where they predict scenarios of management of solid waste produced by hotels as well as the problems of disposal and recycling reflected through change and behaviour, related to disposable plastic packaging and serving utensils [23, 24]. The discussion continues and explores the technological solutions that would provide and enable reuse, recycling and sustainable disposal [25]. Further exploration and analysis of sustainability in the hospitality industry is related to food management as well as food waste that emerge as a crucial issue in economies with limited resources [26, 27].

In the link between tourism and innovative tourism products, modern market opportunities are emerging, such as new markets, market niche differentiation, digitalisation in tourism and hospitality, new forms of travel and different accommodation types. Today, information and communication has become the key element of modern innovative tourism products where, by the progress of IT technologies, tourism becomes digitalised and these technologies are slowly creeping into all the hospitality business components [16].

The specificity and competitiveness of tourism as a phenomenon of the global economic, social and ecological system is greatly conditioned by hospitality as an economic activity. Cerović et al. (2005) [17] gave the most accurate definition, where they precisely defined a hotel as a facility, i.e. a structure which provides services of accommodation to guests/tourists for at least one night, with food and drink services. A hotel is an integral organisational unity in which people play an important role, especially specifically trained service staff [7]. Hotels, apart from their regular activities of provision of hotel accommodation capacities, also provide accompanying hotel services in organised and equipped facilities.

Integrated into the accommodation unit, innovative solutions contribute to design of smart hotel rooms that provide

clients with various benefits supported by digital technologies. They include: management of guests' digital experience, apps for personal devices, facilities for fully functional digital rooms (including digital assistant, robot butler, smart mirrors, modular interfaces, etc.).

Hotel services consist of a series of processes which are managed, and which need constant maintenance and improvement in order to eliminate flaws and errors, so that guests can receive a quality and comprehensive hospitality service. Efficiency and effectiveness are also crucial, as well as compatibility with "green" standards, certificates and eco labels (ISO, Green key, Sustainable hotel, etc.) [28].

## 2.2. Influence of Technologies and Sustainable Solutions in the Hospitality Industry

Hospitality introduces into its business innovative technological solutions as it is clear that, by using them, it can further and much more strongly advance its business performance, competitiveness and comparative advantages in the market. Today, tourists of all structures and especially those from the market youth segment, powerfully IT literate, expect of their hotel accommodation the comfort of a life provided to them by IT technologies, which they have at home or which are the subject of newly generated needs and desires. This is why hotels introduce into their business innovative technological solutions and digital transformation, in order to be ahead of their competition and to provide their tourists with all the digital needs which they require [29].

With the support of technologies, many functions in hospitality are managed and many jobs are completed more easily, such as direct contact with clients, CRM process (Customer Relationship Management), MICE events are organised and anticipatory sales management, revenue management and the whole property management. Through the management information system (MIS), IT technologies enable hotel management to make proper business decisions, which result in a correct strategic implementation of activities assisting hotel profitability and overall progress in the economic system.

By applying IT-supported innovations, travel became "consumer goods", as such encompassing different booking systems, Internet search engines, virtual distribution systems, online tourist agencies, booking of accommodation, transport, tourist attraction valorisation and other tourism system elements [30].

With the development of technology and information process digitalisation, interactive communication through the Internet (Facebook, Twitter, YouTube, bloggers, web communication, mobile applications, chat services, Instagram) leads to the development of new business trends in tourism. Many authors attach great attention to the research of this phenomenon, and they follow the powerful development and influence of multimedia communication using ICT technology in tourism [31]. The application of IT technologies in the hotel business leads to the creation of innovative tourism products which contribute to its powerful development in international and global tourism markets. With implementation of innovative products, assisted by IT support, tourism generates a better market position, larger market shares and general competitiveness resulting in being ahead of its competitors, while contributing to tourism in the way that it improves its indicators, such as traffic, tourist arrivals, overnights, prolonged stay time and others [32].

One of the most efficient ways of making energy savings in hotel rooms is implementation of smart hotel solutions, i.e. intelligent hotel rooms with the possibility of access control, considerable energy savings and provision of other services [33]. Slivar and Golja (2016) [34] emphasise that, with implementation of smart rooms, better management is achieved of energy, which ultimately leads to savings, while providing a higher quality service to guests, increasing the level of safety of the whole system and the hotel staff can act upon always fresh information [35, 36].

By integrating IT appliances, hoteliers can monitor the movement of guests, provide support to guests' access to IT appliances and enable them to use IT appliances within their hotel rooms. This is how all IT appliances in a hotel are integrated into a unique IP network and they include the following systems [37]: mobile applications, integration of fixed and mobile telephony in the hotel, TV, video facilities, games, gambling, Internet access, mini bar management, lighting control, use of smart cards and hotel information system. The IT appliance integration in the hotel industry also raises questions related to privacy and preference and guest behavioural models. They are the subject of different discussions about the levels of ethics and acceptable collection and use of guests' personal data, for which a verified GDPR consent is a prerequisite.

Summarised from the applicative aspect, six modern trends are being affirmed in hospitality, which have encouraged the technological adaptation of hotels to modern innovative technological solutions. Those trends are as follows [38]: (1) acting according to "big data", (2) voice ordering technology, (3) mobile applications for hotels, (4) block chain technology, (5) technology of wearable devices and (6) E-chargers (i.e. E-bikes).

Within the context of modern trends, Hirst (2017) [39] explores how to educate different consumer segments about sustainability, while Floričić (2017) [40] research recognisability, importance and impact of modern technologies and innovations on hotel competitiveness. The results show that young people recognise the attractiveness of technologies which contribute to the hotel competitiveness according to the following rank: (1) technologies related to energy management, (2) technologies related to innovative design and arrangement, (3) technologies related to e-marketing in

the hospitality business, (4) innovative theming as a special experience (5) technologies related to business process informatization in hotels, (6) innovative physical and architectural organisation (7) technologies related to virtual intelligence, (8) technologies related to virtual reality. The two last listed technologies, occupying 7th and 8th ranks should, theoretically, more strongly affect the attractiveness, but the research did not prove this hypothesis. The possible reason for this lies in a flawed perception and knowledge as to what exactly the listed technologies include and what the scopes of their applications to the real hospitality business and marketing are. The quoted data includes young people's opinions about the potential of the contribution of hotel competitiveness technologies and innovations in relation to traditional hotel offers.

### 3. Materials and Methods

Further to consideration of technologies within the context of modern progress and competitiveness, the author conducted research of the young people's segment on their perception, attitudes and behaviour towards sustainable development and responsible resource management in hospitality. The research was conducted through a questionnaire which consisted of three parts: the first one explored the demographic characteristics of the sample, the second part of the questionnaire included personal attitude questions that explored the expected and obtained values of expenditure preferences and sustainability importance and, finally, the third part included the evaluation using the gradual system conducted through the 1-5 Likert scale, where 5 is considered as the highest score. It explored the respondents' perception of differentiated sustainable solutions and grading according to their importance.

The presented researches were designed to jointly explore different angles of sustainable preferences and behaviour of tourist demand of the future which is nowadays an educated youth segment who participate in tourism and travel activities. The methodology flowchart is as follows:

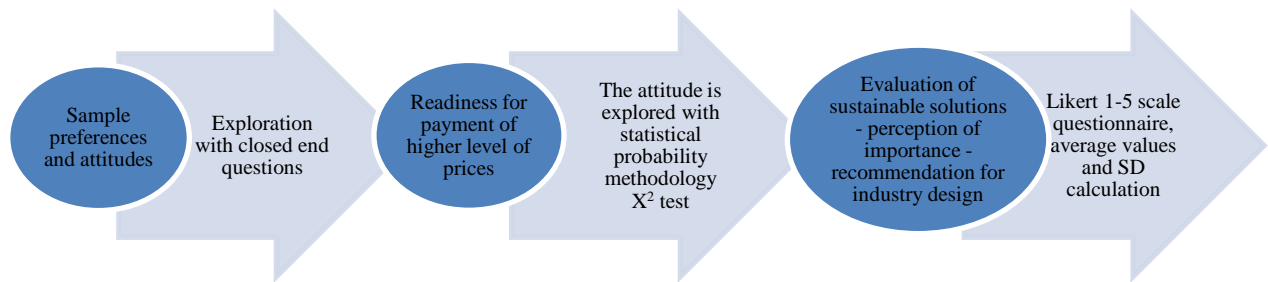


Figure 1. Research methodology flowchart

The scientific methodology included qualitative and quantitative methods and the results led to contributions. The expected results are related to the main hypothesis of the paper explained in the introduction section.

### 4. Results and Discussion

Data was gathered by personal communication in July 2019 and completed questionnaires which were available in paper format. The sample consisted of 102 respondents which represents a response rate of 92.7%. According to gender, 51% of the respondents were female and 49% male young persons of which (total sample 102) 27% were under 20 years of age, from 20-25 years of age 66% and older than 26 years of age 7% of the respondents. The educational status of the sample shows that 85.3% were students. The data was processed with scientific methodology which included both types of methods, quantitative such as statistical evaluation and qualitative methods: analysis, synthesis, description, generalisation, specialisation, historic method and others. The research is indicative in the sense of examination of levels of education of the Croatian society youth population and their preference for sustainable hospitality accommodation over traditional types. It is important to point out that the youth segment generally shows a higher familiarity and acceptance level towards technology and they show sensibility towards sustainability issues.

Table 1. Personal attitudes and hospitality preferences – youth segment

Answer	YES		NO	
	N	%	N	%
Personal attitude				
Have you ever stayed in a hotel which operates and promotes sustainability values?	52.0	51.0	50.0	49.0
When you choose a hotel for your future stay, would you prefer sustainable hospitality over a classic hotel?	71.0	69.6	31.0	30.4
Do you live "sustainably" in your everyday life?	68.0	66.7	34.0	33.3
I would be ready to pay more for my accommodation if I knew that this hotel operates under sustainability concepts.	48.0	47.1	54.0	52.9
I would be willing to personally contribute some money through a humanitarian campaign organised in the hotel I am staying in.	50.0	49.0	52.0	51.0

Further to the research results presented in Table 1, variables are identified which point to the connection between statements, but the obtained values do not confirm this. The statements of preference for sustainable hotels in relation to classical hotels and preparedness to pay higher prices are, therefore, tested using Chi squared test ( $X^2$ ), which assesses the values obtained by the research in relation to the expected ones of the two independent samples.

**Table 2. Relationship between sustainable hotel preferences and payment attitudes**

	Preference in choosing sustainable hotel - %	Readiness to pay more for stay in sustainable hotel - %	Marginal Row Totals
Obtained frequency	71.0	48.0	119.0
Expected frequency	50.0	50.0	100.0
Marginal Column Totals	121.0	98.0	200 (Grand Total)
Chi-squared test: 8.9		p-value: 0.00285171	Degrees of freedom: 1

The results point to the predominance of importance, in which over 90% of respondents confirm the importance of sustainable initiatives and resource management, 52.9% of them express that they are not prepared to pay higher prices for quality but, at the same time, a more expensive “sustainable” hotel service. Equally, they are not prepared to make a financial contribution and support for sustainable and socially responsible initiatives (51%). Despite the negative attitude, the answer to the key question: “When you choose a hotel for your future stay, would you prefer sustainable hospitality over a classic hotel?” is dominantly positive 69.6% and presents a trend of future behaviour. It points to the need for implementation of sustainable labels that would clearly present the advantages of sustainable operations of a hotel in the market.

Certificate requirements can have a direct impact on the criteria of planning, architecture and design and, through them, the environmental protection policy can be evaluated by the application of ecologically acceptable materials, use of renewable energy sources, control of noise levels and harmless gas emissions, pronounced care for the landscape and environment, materials used in the hotel construction, as well as a unique hotel design.

When considering the problem area, the question is asked associated with the main sustainable technologies, which form an integral part of the sustainable hotel product, made up of the physical characteristics of the hotel accommodation facility – sustainably planned and constructed buildings in a defined space plan. Concerning the carrying capacity of the surrounding infrastructure, green technological innovations and the sociological context of the sustainability pillar through investment activities result in constructions for tourism, hotels which achieve market competitiveness and, correspondingly, profitability.

The attitudes were examined using the level of agreement Likert scale (a scale up to grade 5), where the highest grade represents the highest level of agreement. The research results are shown in Table 3 below.

**Table 3. Attitude and preferences of youth consumers – Personal engagement and sustainability**

Importance of sustainable initiatives	Importance of sustainable waste management	Importance of sustainable energy management	Importance of sustainable water management	Importance of sustainable food and provision management
Grade 5 - N	48.0	43.0	59.0	69.0
%	47.1	42.2	57.8	67.6
Grade 4 - N	39.0	48.0	33.0	26.0
%	38.2	47.1	32.4	25.5
Grade 3 - N	13.0	8.0	7.0	6.0
%	12.7	7.8	6.9	5.9
Grade 2 - N	1.0	2.0	1.0	0.0
%	1.0	2.0	1.0	0.0
Grade 1 - N	1.0	1.0	2.0	1.0
%	1.0	1.0	2.0	1.0
Total - N	102.0	102.0	102.0	102.0
%	100.0	100.0	100.0	100.0
<b>Average grade</b>	<b>4.3</b>	<b>4.2</b>	<b>4.4</b>	<b>4.6</b>
<b>Standard dev.</b>	<b>35.9</b>	<b>36.4</b>	<b>37.3</b>	<b>39.1</b>



The research resulted in an exceptionally high level of answers by respondents, who claim that sustainable initiatives and management of resources and business organisation are important for the recognisability and competitiveness of a hotel. The summarised grade of importance is highlighted (the sum of grade 5 and grade 4) importance of sustainable: waste management (85.3%), energy management (89.3%), water management (90.2%), food management (93.1%). Ranking evaluation shows that respondents find that the most important is sustainable food and provision management (grade 4.6), followed by sustainable water management (4.4), waste management (4.3) and sustainable energy management (4.2).



Figure 2. Perception of sustainable solutions in the hospitality industry – tourism demand

Studying the Tables 1, 2 and 3, and considering the implications of the respondents' responses, who declaratively prefer accommodation in a sustainably-organised hospitality business, but who are not prepared to pay a higher price for it, the knowledge is summed up of insufficiently developed awareness of the importance of communication and education. Namely, the author's expectations in accordance with the literature review theoretical guidelines and expressed through the main hypothesis, presumed that the respondents would predominantly show their interest in sustainable accommodation and, accordingly, be prepared to pay a higher level of prices, which was not proven by the research and, therefore, the main hypothesis is rejected. The auxiliary hypothesis, which researches the perception of the importance of sustainable technologies in the hospitality industry is confirmed. The respondents mostly confirmed the high level of evaluation of all the main technology subtypes, differentiated according to the knowledge from the literature review and ranked technologies according to the perception of importance: food, water, waste and energy. Considered from the entrepreneurial aspect of the hospitality industry organisation, as well as the designers and engineering positions, the conclusion points out what the tourism demand considers important and which segments require better presentation through promotional strategies. This finding does not presume the influence of product innovations and development strategies; it points to the importance of communication and promotional activities that could enhance the competitive advantage of hotels in the tourism market.

## 5. Conclusions

Sustainable hospitality facilities have emerged as a result of implementation of the sustainable development concept in tourism for the purposes of achievement of an ecologically more effective, more responsible, but also a more efficient and more profitable business practice. Hotel facilities which are constructed, and which operate in line with the sustainability principles use water, electricity and other resources much more efficiently and effectively than conventional hotels and their activities in the local community are characterised by socially responsible business practices.

The complexity of the topic area is reflected through differentiated study fields and continuous innovation of the hotel product within the sustainability concept, where innovative technological solutions are recognised as the key to qualitative changes, but also to market competitiveness, considered by the tourist demand segment.

The application of technology and information trends in the hotel industry is closely related to the satisfaction of hotel guests' needs, increase of attractiveness and competitiveness, given that, consequently, it realises a higher profitability and success in the increase in financial business performance. However, this is not the only goal of the implementation of innovative technological solutions. Hoteliers should be aware of the fact that, by implementation of such solutions, they are improving the business and attracting a larger number of guests but, while simultaneously being socially and ecologically aware and while implementing the sustainable development concept in the organisation of business processes, through which negative effects on the environment and on the social community in which it operates will be reduced. It is possible to affirm ecological and social responsibility strategies upon implementation of technological solutions and innovations in hotels, while including all the components which will have green technology status, i.e. the choice of such a technology which would enable them to, by their business

activities, protect the environment and the social community in which they operate. Examples of implementation of such technologies are renewable energy sources in hotels, water treatment technology, reduction of carbon gas emissions, strategy of hotel waste disposal in an ecological manner, provision and food management and other green activities.

Taking into consideration the attitude of the youth segment is of exceptional importance. Young people follow modern trends; they are open to innovations and ITC technologies and, through social networks and other e-marketing channels, included in a propulsive world, of sharing of information, multimedia contents and entertainment. Young people are the consumers of the future; their preferences and attitudes point to the trends according to which the world hotel industry should form its integral product and organise its business.

The research results point to the fact that the young population is well aware of sustainability and social responsibility but, as they represent a segment which, given their age, is at the very beginning of the cycle of creation of their private material status, according to their expressed attitudes, they are not prepared to pay higher level prices. Given the hotel industry investment in technological and social innovations and a recognised awareness of young people, hotel companies should not neglect this consumer market segment but, on the other hand, should strive to affirm young people's placement and stay in sustainable hotels by means of promotional, pricing and distribution strategies. Young people are aware consumers of the future whom it is possible to attach to sustainable hotel brands by marketing strategies and independent hotels and develop loyalty strategies of linking with guests where traditional concepts are surpassed. A guest becomes a partner, a co-creator of new values and socially responsible activities, which represents also a platform for future considerations and further research.

The paper explores sustainable innovative solutions in hotels, aiming to achieve new differentiation and comparative advantage when benchmarking with standard hotels perceived by the youth population segment. The perceived attitudes could form and influence the creation and application of further innovative solutions in the hospitality industry. It presents a platform for practical application of innovations related to resources and water management, as well as food waste and everyday waste management. When considering the financial results in the hospitality industry, savings in input resources play an important role in the strategic design and engineering of hotel buildings, as well as the market competitiveness and advantage that hotels which implement sustainable solutions obtain. Collection of data, analysis and comprehension of youth consumers' attitudes present the scientific value that points to the character of innovative solutions which are the most appreciated and valued by consumers, i.e. from the tourism demand point of view. Although the main purpose of sustainable solution implementation is the process efficiency and sustainability, the promotional strength of specific activities should be taken into consideration and be strategically used through tactical marketing strategies. As an additional contribution, the research results point to the importance of continuous communication with the market segment of the youth population, as future consumers, and direct and indirect education through various educational programmes and formation of public opinion about the importance of the perception of both positive and responsible activities and sustainable innovations.

Therefore, the hypotheses which were set and tested through the paper are:

H0 Tourism demand of the future appreciates corporate responsibility and resources management and predominantly chooses sustainable hotels. The hypothesis is not confirmed as the youth segment show a general preference towards sustainable hotels, but it is not predominant. This statement is supported by the fact that the respondents are not willing to pay higher levels of prices in order to support implementation of innovative technological solutions that need to be financed and calculated through pricing strategies.

H1 The tourist demand preferences of sustainable solutions and evaluated benefits of sustainable solutions present the incentive to the technological and engineering companies to pursue new advancements and innovations. The auxiliary hypothesis is confirmed as the obtained knowledge could direct both the technological companies and hotels to create proper marketing strategies and communication with present and new consumers of the future.

The main limitation of this study lies in the shortage of information about the costs of technical innovative solutions that would be implemented in hotel operations in order to make comparative analysis and correlation of the costs and benefits of solution implementation. The author found various offers and solutions application manuals, but the systems should be engineered, dimensioned and analysed individually and this presents the platform for future research.

The concept of sustainable business forms a basis for a powerful future success of the hotel industry in the global tourism markets, as a two-fold success is achieved by it; business and profitability growth, with simultaneously affirmed ecological and social responsibility, where attractiveness and new competitiveness are achieved and where hotels become attractive to both tourists and other tourism system stakeholders.



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## 8. Conflicts of Interest

The authors declare no conflict of interest.

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