IS TOURISM DESTINATION MANAGEMENT IN SERBIA ALIGNED WITH THE PRINCIPLES OF SMART TOURIST DESTINATIONS?

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Abstract

Purpose – The aim of this paper is to identify tourists' satisfaction with ICT performance in two tourist destinations in Serbia. In addition, one of the goals of the research is to determine the weaknesses and strengths of the tourist offer at the destinations, in order to choose an adequate tourism development strategy in the future to improve the competitiveness of the tourist offer in Serbia and possibly find patterns of development between different destinations.

Methodology – Measuring the importance and satisfaction with the performance of smart technologies was carried out in two destinations, Novi Sad and Vrnjačka Banja (Serbia). IPA analysis was used to assess the importance and performance of 38 attributes related to ICT in the selected destinations. Exploratory factor analysis was used to identify groups of smart technologies that tourists consider when evaluating smart tourist destinations.

Findings – When examining individual components, the ICT tourism offer in Novi Sad and Vrnjačka Banja are evaluated as fairly low. The results of the analysis showed that Novi Sad, is a more competitive destination than Vrnjačka Banja in terms of the deployment of smart technologies.

Contribution – The analysis of weaknesses and strengths can be particularly insightful in revealing what is prioritized more and what is viewed as less crucially, for the overall experience and satisfaction of tourists in order to improve the tourist experience. The results of this research provide practical knowledge for DMOs and tourism companies, to understand the benefits of smart tourism as an important direction in improving the competitiveness of a tourist destination.

Keywords: smart tourism destination, ICT, smart tourism, tourist experience, competitiveness.

INTRODUCTION

Given that technological progress in the last few years has had a great impact on the tourism industry (Koo et al. 2015), research is becoming more concerned with the importance of information-communication technology (ICT) implementation for the successful development of smart cities and destinations (Cosgrave et al. 2013). The technological innovation of the tourism industry began with the development of global distribution and central reservation systems (Buhalis 2003). Then, with the advent of mobile phones and the growth of social media (Sigala et al. 2012), information became even more mobile and the provision of tourist services became more intelligent. In the context of smart tourism, the role of technologies has been examined from different aspects, including its significance in defining smart tourism (Gretzel et al. 2015), its role in decision-making and travel planning (Huang et al. 2017), the adoption and application

of smart technologies (Lee et al. 2018), etc. When technologies are incorporated in a tourist destination, it is much easier to enhance the tourists' experience and foster healthy competition in the tourism industry (Hunter et al. 2015).

Digital technologies allow a large amount of data to be transformed into valuable data that can create high mobility of tourism information (Boes et al. 2015a). The use of sensors, Wi-Fi networks and other devices to collect and process data in real time are essential guidelines for managing a smart tourist destination. Some examples of technological advancements that are significant for mobility and management are free WiFi access, traffic management applications, parking spot management applications, crowd management and control, etc. Another area where the use of technology has produced notable benefits is access to the destination's cultural heritage. Innovations such as QR codes, virtual reality, online ticketing for various events, video and audio guides, personalized museum experiences with geolocation, tourist routes with geolocation and many others, have provided tourists with unique experiences, entirely distinct from those offered by mass tourism. Research in the field of smart tourism destinations are mainly focused on the importance and implementation of ICT in the destination (Wang et al. 2013; Guo et al. 2014). This is comprehensible, given that ICTs are linked to economic growth (Avgerou 2003), that can be seen in the field of tourism. However, taking into account the significance of ICT in creating the tourist experience, research is also required to determine tourist preferences about the importance of smart technologies. The preferences of tourists regarding the tourist offer have changed significantly in recent years. There is still an insufficient number of studies dealing with the analysis of the impact of technologies on tourists' satisfaction with ICT performance, i.e. their preferences (Wang et al. 2016; Cimbaljević et al. 2021) that can be used to determine the strategy of a smart tourist destination.

This paper aims to examine whether the management of tourist destinations in Serbia is aligned with the principles of smart tourist destinations. The research was conducted in two destinations (Novi Sad and Vrnjačka Banja), with the aim to analyze the importance and performance of smart technologies and gain insight into the tourist's preferences. The paper adopts the systematization of smart technologies by Wang et al. (2016), which are further aligned with the tourist resources of the two destinations where the research was conducted. Based on this, it is possible to gain an insight into the weaknesses and strengths, assess the impact that ICT has in these destinations and thus obtain useful information for planning smart tourism destinations.

1. SMART TECHNOLOGY AS A BASIS OF SMART TOURISM DESTINATION

Several authors emphasize the importance of smart technologies in the management of smart tourism destinations (Boes et al. 2015a; Gomes et al. 2017). Other authors (Wang et al. 2013) state that smart tourism destinations use ICT to improve and operate tourism processes. Accordingly, smart tourist destinations are defined as places that use available technological tools, enabling tourist supply and demand to participate in the co-creation of the tourist experience, and providing certain benefits for the destination itself and organizations (Boes et al. 2015b). Several authors (Guo et al. 2014; Wang et al. 2013; Zhu et al. 2014) have a similar approach in defining smart tourist destinations,

emphasizing that they should use available technologies, for the co-creation of tourist experience and satisfaction. More and more travelers are interacting with service providers and collaborating together to co-create their own experiences (Buhalis and Amaranggana 2015). From a tourism perspective, information technologies can enhance the experience by providing all information about the destination and its services at the travel planning stage. Then, during the stay at the destination, by enabling real-time information access and the sharing of experience after the journey (Buhalis and Amaranggana 2015). The essence of the use of ICT in smart destinations is that it can influence the destination's ability to meet its goals and respond quickly to the personalized needs of tourists, tourism businesses and administrations. The management of a smart destination must be integrated, in order to achieve numerous goals - economic, social, environmental efficiency and sustainable development, competitiveness in relation to other destinations and the quality of life of the population (Hernandez-Martin et al. 2017).

The big challenge of today's tourist destinations is their ability to implement smart technologies in the physical environment, on the basis of which they can achieve a competitive advantage. In such circumstances, the DMO and the administration have the most important role in managing the tourism agenda. This implies that destination managers should carefully choose the technologies they will implement in the destination The decision regarding the technologies to be used in the management process and the destination's technological growth vision is not a simple task. Nevertheless, technological implementation should be carried out in accordance with the priority needs of the destination, and not according to the sales power of technology companies (Ivars-Baidal et al. 2019). Due to the current competition in the tourism market, it is important for destination management to explore the possibilities of applying technologies to facilitate the creation of personalized experiences and services.

2. SMART TECHNOLOGY APPLICATION – TOWARD TOURISTS EXPERIENCE

Nowadays, DMOs are challenged to improve their market position, as competition is greater than ever. An advantage in the fierce competition can only be achieved by providing unique and unforgettable experiences. However, what changes the nature of the experience? Experiences are transformed, as tourists actively participate in co-creating their own experiences, while technology mediates this process (Neuhofer et al. 2012). Therefore, it is important for DMOs to encourage the synchronization of different technologies so that the data obtained in real time may be used for operational decision-making much more effectively (Gretzel et al. 2015). Although the development of smart infrastructures (free WiFi networks, sensor-equipped transportation networks, etc) may be constrained for smaller destinations, they can nevertheless be highly successful in implementing the characteristics of a smart destination (quality social media campaign, successful cooperation between public and private companies, sustainable development tourism, involvement of local citizens, application of mobile applications, and similar) (Tran et al. 2017). The implementation of ICTs (such as mobile applications for parking, crowd tracking applications, QR codes, RFID, etc) within a destination, tourist attraction or event organization can significantly improve the interactivity and satisfaction of

tourists and is an important aspect when developing smart tourist destinations. As for developing destinations Femenia-Serra et al. (2019b) state that they should put their main emphasis on implementing technologies and practices that are already successful and widely adopted in many destinations. As stated by Höjer and Wangel (2015), the development of one technology cannot make a significant contribution to the development of smart tourism, but the interconnection and synchronization of different technologies.

Smartphones offer a wide range of capabilities that support the needs of tourists, thanks to modern operating systems, efficient processors, Internet access, as well as numerous productivity-enhancing applications (Yu et al. 2018; Dorcic et al. 2018). In the last few years, the application of QR codes, has found great importance in travel, but also in people's lives in general. QR codes in tourism can be used as payment technology via mobile phones (Lou et al. 2017), to obtain detailed information or create a virtual tour in cultural facilities, such as museums or galleries (Medić and Pavlović 2014; Perez-Sanagustín et al. 2016), in transportation, to help travelers find bus schedules or to book and check train tickets (Rizwan 2016), in hotels , for example, on the menu so that guests can watch the dish being prepared via video or on room access cards instead of keys to increase security, etc. (Rizwan 2017). Thanks to improvements in hardware, technological capabilities and increasing demand for mobile devices, the development of new mobile technologies such as Augmented Reality (AR) and Virtual Reality (VR) applications has accelerated. AR as a technique that combines live display with virtual computer-generated images, has found wide application in the field of cultural heritage (Tscheu and Buhalis 2016), thereby creating an augmented reality experience in real time. In their research, Jung and colleagues (Jung et al. 2016) emphasize that the entertainment experience is the strongest predictor of the overall tourist experience, which creates a desire for tourists to revisit a tourist attraction where AR and VR are applied. Each of the mentioned technologies has had a great impact on the tourist experience.

Numerous studies have shown that tourists' perceptions of smart tourism destinations are directly impacted by the presence of technology (Ivars-Baidal et al. 2019; Mendes-Filho et al. 2022). Tourists are using technology more effectively, not just to enhance their travel experiences but also to communicate with other smart tourism destination stakeholders in real-time and take part in co-creation processes. (Femenia-Serra et al. 2019a). In previous research it is stated that some of the most important characteristics of smart tourism technologies, from the aspect of tourists, are accessibility, personalization, informativeness and interactivity, stating that it leads to a more positive perception of smart technologies (Goo et al. 2022; Jeong and Shin 2020). Tourists' perceptions of smart technologies represent a crucial component of the travel experience and a factor in determining their satisfaction and future behavior. Other authors (Zwang et al. 2022) also state that tourist satisfaction is being driven up by visitors' high perceptions of smart tourism technologies.

3. METHODOLOGY

3.1. Sample and research instruments

A survey regarding the importance and performance of smart technologies was conducted in Novi Sad and Vrnjačka Banja. Taking into account the varied tourist products in these destinations, and the different development of technological facilities, the samples were observed separately for each destination. A total of 359 respondents participated in the survey in order to examine tourists' perceptions toward ICT adoption. Data were analyzed in SPSS 20.0 statistical software. The survey instrument was developed using Wang et al. (2016) research, which examined visitor preferences using the example of a smart tourist attraction. The first part of the questionnaire measure importance and perception of 38 statements related to ICTs adoption in two selected tourist destinations. In the case of the ICT importance the items were rated on a five-point Likert scale (from 1 = not at all important to 5 = very important). Regarding ICT performance, the same items were rated on a scale from 1 = poor to 5 = excellent. The second part of this questionnaire referred to the sociodemographic characteristics of the respondents (gender, age, education, monthly income). Since the research was aimed at foreign and domestic tourists, the questionnaire was translated into both Serbian and English. Printed questionnaires were used, which the respondents filled out on the spot. They were previously informed about the topic of the research, so participation in the research was voluntary.

3.2. IPA method and Exploratory factor analysis

In order to examine and understand the way tourists perceive information technologies, a Principal Components Factor Analysis with Varimax rotation was applied. The underlying factors were extracted by principal component analysis and the optimal number of factors was determined based on a series of exclusion criteria, such as factor saturations, characteristic root, variance explained, and break point. Items with loadings lower than 0.5 or with cross-loadings were discarded from further analysis (Hair et al. 1998). These criteria were retained as in the research work of Wang et al. (2016), from where the original questionnaire was taken, given that the goal was to conduct a similar study in a different type of destination. Further, IPA analysis was used to assess the importance and performance of 38 attributes related to ICT in Novi Sad and Vrnjačka Banja. The analysis is based on the conceptual foundations of the multiple choice model (Edwards and Newman 1982) and serves to identify and evaluate the management strategy. IPA combines measures of attribute importance and performance into a two-dimensional network, with performance measured against the same set of attributes as importance. This is how attributes are compared.

4. RESULTS

4.1. Sociodemographic characteristics

Regarding the distribution of respondents in the Novi Sad sample, it can be seen that there are significantly more female respondents (58%) than male respondents (42%). In Vrnjačka Banja, 57.8% of respondents were female and 42.2% were male, which is nearly the same as Novi Sad average. In both cases, respondents are predominately younger (between 20 and 30 years old) and have higher levels of education, i.e. bachelor's degrees.

4.2. Results of Exploratory Factor analysis

4.2.1. Novi Sad

Based on the KMO (0.94) and Bartlett's test (p<0.001) that meet the requirements, a factor analysis of principal components with Varimax rotation was applied. Based on the mentioned criteria (Wang et al. 2016), 7 items with factor loadings lower than 0.5 were separated from the analysis, and 5 factors of ICT experience by tourists were proposed (Table 1). Factor one "Smart Destination Management" describes electronic or smart information control, access to information, complaints, smart environment. All of these items relate to accessible access to and management of information. The second factor "Smart Information Access" is mostly related to electronic access to information - online applications, various types of websites, online coupons. The third factor "Virtual Environment and Smart Management in Real Time" indicate the virtual tourist experience and networks, augmented reality, but also the provision of timely information at the destination. Factor four "E-availability of general service information" include items about the weather forecast, traffic safety and crowd assessment at events. Factor five "Smart Communication" include short messages service and telephone conversation with the operator.

Table 1: **Results of the factor analysis – Novi Sad**

	Label	Factor loading	Eigenvalue	Variance explained	α	Mean	S.D.
F1	**Smart Destination Management**		**5,749**	**15,129**	**0,880**		
P15	Electronic-entrance guard system	,742				1,7800	1,73425
P18	Crowd handling	,696				1,5840	1,57380
P17	Tourist-flow monitoring	,620				1,6720	1,56660
P22	Electronic-ticketing system	,615				2,2600	1,70294
P25	Tourist-flow forecast	,589				2,2040	1,70588

Table 1 (*continued*)

	Label	Factor loading	Eigenvalue	Variance explained	α	Mean	S.D.
P20	E-complaint handling	,567				1,7360	1,63616
P14	Smart card (band)	,542				1,8800	1,75669
P27	Queuing-time forecast	,518				2,0960	1,66670
P32	Intelligent-environment monitoring	,511				2,1280	1,65971
F2	**Smart Information Access**		**5,157**	**13,572**	**0,858**		
P2	Mobile application	,672				2,7400	1,62819
P1	Tourist attraction home page	,664				2,9560	1,56841
P11	E-tourism-recommendation system	,646				2,9160	1,73000
P4	Online information access	,613				3,4600	1,38277
P10	Personal-itinerary design	,591				2,1040	1,65412
P9	Intelligent-guide system	,582				2,0720	1,63631
P12	Guiding-information service	,562				2,3040	1,75268
P23	Online coupons	,562				2,3640	1,80570
P13	E-tour map	,515				3,2920	1,71420
F3	**Virtual Environment and Smart Management in Real Time**		**4,982**	**13,110**	**0,901**		
P35	Virtual tourism experience	,745				1,7960	1,66296
P36	Virtual travel community	,740				2,0880	1,79475
P37	Augmented reality	,691				1,4920	1,54515
P16	Smart environment	,627				1,9520	1,74179
P31	Real-time traffic broadcast	,579				1,8320	1,66338

Table 1 (*continued*)

	Label	Factor loading	Eigenvalue	Variance explained	α	Mean	S.D.
P30	Smart vehicle scheduling	,561				1,5800	1,58672
P34	Smart emergency response system	,538				2,4560	1,83015
F4	**E-availability of general service information**		**2,635**	**6,935**	**0,611**		
P28	Weather forecas	,665				3,2650	1,35423
P33	Traffic-safety protection	,608				3,8000	1,19041
P26	Festival-activity forecast	,569				2,6640	1,70491
F5	**Smart Communication**		**2,119**	**5,575**	**0,581**		
P7	Short-messaging service and multimedia-messaging service	,700				2,4280	1,66370
P8	Call-service center	,586				1,9920	1,66705

Source: Authors' research

4.2.2. Vrnjačka Banja

The six-factor solution is closer to the earlier factor structures on this questionnaire, and the decision was made to accept it. The KMO (0.836) and Bartlett dispersion test (p<0.001) indicate that Factor analysis is applicable to the data. Table 2 shows the indicators of the applied factor analysis of the main components with Varimax rotation. First factor "Online Information and Monitoring" implies online information, electronic guides, estimation of crowds and tourist traffic, estimation of waiting and retention. The second factor "Smart Information System" include online booking, mobile payment, online coupons, QR codes, online tour and real-time traffic flow. Factor three,"Smart access to services and management" implies free WiFi, online recommendations and maps, and a smart environment. The fourth factor "Virtual Environment" describes virtual tourism experience and networks, as well as mobile applications. Factor five "Smart Communication" includes short and multimedia messages service and info desk monitors. Factor six "Service Online Information" describes web sites and the weather forecast applications.

Table 2: **Results of the factor analysis – Vrnjačka Banja**

	Label	Factor loading	Eigenvalue	Variance explained	α	Mean	S.D.
F1	**Online Information and Monitoring**		**5,199**	**13,681**	**0,848**		
P17	Tourist-flow monitoring	,723				1,0183	1,44646
P9	Intelligent-guide system	,667				1,0826	1,54637
P18	Crowd handling	,653				1,2202	1,58323
P12	Guiding-information service	,639				1,2936	1,72295
P25	Tourist-flow forecast	,593				1,4037	1,78013
P8	Call-service center	,510				1,1835	1,62256
P27	Queuing-time forecast	,500				1,2844	1,71103
F2	**Smart Information System**		**5,181**	**13,635**	**0,802**		
P24	Online booking	,734				2,9450	1,67683
P21	Mobile payment	,694				1,6606	1,80647
P31	Real-time traffic broadcast	,659				1,1376	1,53036
P23	Online coupons	,620				2,5596	2,12756
P37	Augmented reality	,590				1,2202	1,69070
P5	QR cods	,514				0,9817	1,41409
P10	Personal-itinerary design	,501				1,1927	1,65259
F3	**Smart access to services and management**		**3,802**	**10,006**	**0,636**		
P3	Free Wifi	,714				1,7960	1,66296
P11	E-tourism-recommendation system	,654				2,2110	2,00496
P13	E-tour map	,637				3,2018	1,99434
P32	Intelligent-environment monitoring	,579				1,7890	1,81084
F4	**Virtual Environment**		**2,772**	**7,295**	**0,687**		
P35	Virtual tourism experience	,720				1,6514	1,81749
P36	Virtual travel community	,690				2,3119	1,99860
P2	Mobile application	,505				2,3945	1,91010

Table 2 (*continued*)

	Label	Factor loading	Eigenvalue	Variance explained	α	Mean	S.D.
F5	**Smart Communication**		**2,158**	**5,680**	**0,684**		
P7	Short-messaging service and multimedia-messaging service	,709				2,7706	2,00755
P6	Electronic touch screen	,654				2,1284	1,98653
F6	**Service Online Information**		**1,827**	**4,808**	**0,609**		
P1	Tourist attraction home page	,690				2,3486	1,80727
P28	Weather forecast	,600				3,7982	1,76792

Source: Authors' research

4.3. Results of IPA – Novi Sad

The overall average values for the importance of smart technologies for tourists are presented on the vertical (y) axis, while the overall average performance values, according to the experiences of tourists in Novi Sad, are presented on the horizontal (x) axis. Graph 1 presents the items, which are arranged in four quadrants. It is evident that tourists' assessments of the condition and the significance of certain content are related. It can be seen that the evaluation of the ICT condition is related to the evaluation of the ICT importance at the destination. This means that the respondents saw the ICT contents they need more available. The smart environment and Queuing-time forecast are distributed in the quadrant M (1,1), which indicates that these items have an above average importance and a lower performance. These ought to be more prominently displayed in the approach of future smart tourism development. Although the item "smart environment" is on the very border with field M (2,1), it is important to support its development, because the awareness of the smart environment is valued as a particularly important component in the development of smart tourism (Buhalis and Amaranggana 2015). Items in the lower left quadrant, M (2,1) (Virtual tourism experience, Virtual travel community, augmented reality, smart vehicle scheduling, real-time traffic broadcast, smart environment, tourist-flow monitoring, crowd handling, e-complaint handling, personal-itinerary design, smart cards, Electronic-entrance guard system, intelligent-guide system and call-service center), are low priorities, which means that they are considered less important, meaning they had a priority below the average level. These technologies are least available at the destination. Components in the upper right quadrant of M (1,2) were rated as very important and had an above average level of priority. They relate to weather forecast, festival-activity forecast, smart emergency response system, traffic-safety protection, electronic ticketing system, guiding-information service, e-tourism-recommendation system, e-tour map, tourist attraction

websites, mobile applications and online information access. Tourists experienced these technologies and rated them as the most prevalent. Managers of tourist destinations should maintain and improve applications that can provide tourists with some general information, and assistance in travel preparation or related to activities at the destination itself. Finally, items in the lower right quadrant, M (2,2), are considered less important but are above average on the performance scale. These include the short-messaging service and multimedia-messaging service and online coupons. It can be said that these two items meet tourists' expectations, therefore they do not require excessive efforts at the destination, in order to match visitors' expectations in the future.

Graph 1: **IPA matrix – ICT technologies Novi Sad**
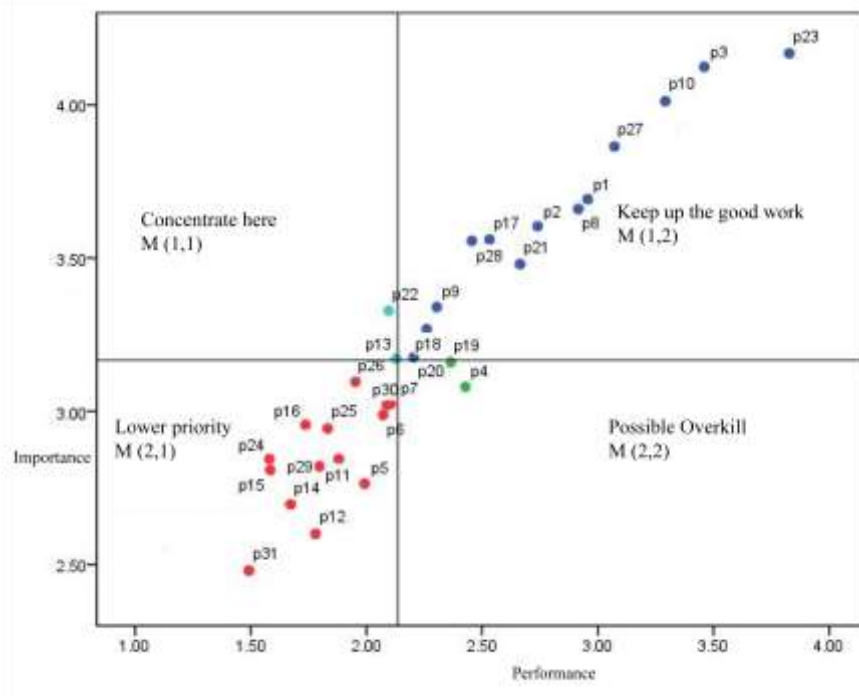
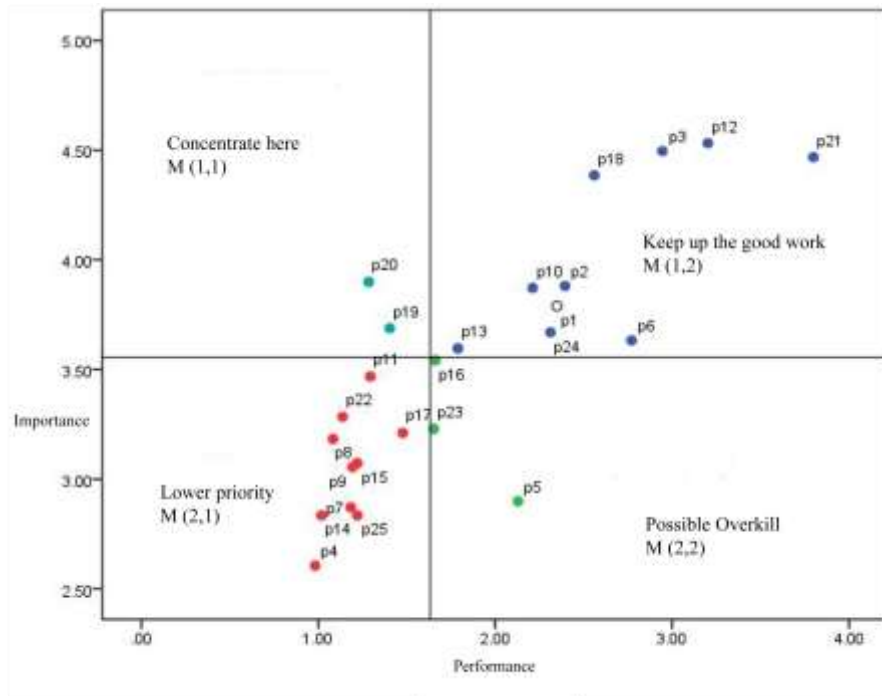*Note: Strategy M (1,1), M (1,2), M (2,1), M (2,2).

4.4. Results of IPA – Vrnjačka Banja

Based on the results of the factor analysis, 25 items which had factor loadings greater than 0.5, were included in the IPA analysis. According to Graph 2, the responses are more dispersed in Vrnjačka Banja than in Novi Sad. Nonetheless, there is also overlap between importance and the performance, proving that tourists' demands have been met. The items in the upper left quadrant of the matrix, M (1,1), are the most significant evaluation items of low-performing smart technologies. These include: tourist-flow forecast and queuing-time forecast. These items represent weaknesses in building a smart tourist destination and need further attention and investment. Items in the lower left

quadrant, M (2,1) include augmented reality, online coupons, real-time traffic broadcast, crowd handling, guiding-information service, tourist-flow monitoring, personal-itinerary design, intelligent-guide system, call-service center and QR codes. It is possible that these items will receive a lower priority due to their relatively low importance.

Items located in the upper right quadrant, M (1,2), perform well and are of particular importance. These include virtual travel community, weather forecast applications, online booking, smart environment, e-tour maps, e-tourism-recommendation system, tourist attraction websites, mobile applications, free Wi-Fi and text and multimedia messaging services. These applications are considered the advantages of Vrnjačka Banja, thus quality management will be required in the future. The items appearing in the lower right quadrant, M (2,2), are less important but perform well. Mobile payment, virtual tourism experience and electronic touch screen stand out here. Given that mobile payment and virtual tourist experience are at the very border with the M (2,1) quadrant, which is a low priority field, the management of the tourism destination should keep the performance of these technologies at the same level, regardless tourists did not consider them particularly important at the given moment. Nevertheless, in the further development of tourism in Vrnjačka Banja, it can represent a great advantage.

Graph 2: **IPA matrix – ICT technologies Vrnjačka Banja**

*Note: Strategy M (1,1), M (1,2), M (2,1), M (2,2).

4.5. Examination of differences in Performance and Importance of Smart Technologies between Novi Sad and Vrnjačka Banja

The t-test for independent samples was used to examine whether there are differences in the responses of tourists who visited Novi Sad and Vrnjačka Banja regarding the assessment of satisfaction with the performance of smart technologies. The results indicate that there are differences on 25 items related to smart technologies, at a significance level of $p < 0.05$. Also, higher scores were achieved by respondents in Novi Sad. The biggest difference was recorded on the item Electronic tourist guides (audio, video). As for the items that are not statistically significant, regardless of the fact that there is a difference in the arithmetic means between them, it is assumed that they are also the weaknesses of a certain tourist destination. In this case, it refers more to the Vrnjačka Banja, given that the technologies are rated with lower average ratings than in Novi Sad.

Further, the t-test for independent samples examined the difference according to the importance of smart technologies on travel, between tourists who visited Novi Sad and Vrnjačka spa. The results indicate that the difference was recorded on 17 items, and on each item, the tourists from Vrnjačka Banja have a statistically significant difference. The biggest difference was noted on the Smart Environment item. This points to the fact that Novi Sad, in terms of competitiveness in the application of smart technologies, is a more competitive destination compared to Vrnjačka Banja. However, it should be borne in mind that regardless of the better results recorded in Novi Sad, one of the problems was noted in the performance evaluation, where it was shown that many respondents were not familiar with the technological potential of these two destinations. That is why the average scores of respondents' satisfaction with performance are lower.

5. DISCUSSION

The analysis of ICT importance and performance determines the current state of development and implementation of smart technologies in two destinations, Novi Sad and Vrnjačka Banja. This provides a solid foundation for examining the advantages and disadvantages of the ICT provided in these locations and throughout Serbia in general, because the two cities mentioned are distinguished by the presence of large number of tourists in the country. Therefore, the findings are crucial for future research in Serbia in order to determine what is particularly important to tourists when considering the ICT options available in the destination. Among other things, such an examination aids in understanding the significance and function of technology in improving the co-creation of the tourist experience. Factor analysis identified five factors related to ICT in Novi Sad and six factors in Vrnjačka Banja, with the key items grouped differently, to some extent. ICTs in Novi Sad are divided into the following categories: "Smart destination management", "Smart Information Access", "Virtual environment and smart management in real time", "E-availability of general service information", and "Smart communication". The findings indicate that Novi Sad has stronger visitor preferences for technology than Vrnjačka Banja. They specifically refer to the technology advantages that the traveler enjoys while at the destination, including improved information availability, a variety of applications, electronic guides, but also for activities prior to the trip itself, such as

websites, online recommendations, electronic maps, etc. On the other hand, the results show that ICTs in Vrnjačka Banja are divided into the following categories: "Online information and monitoring", "Smart information system", "Smart access to services and management", "Virtual environment", "Smart communication", and "Service online information". The results indicate that visitors favor info-desk monitors and accessible WiFi networks in Vrnjaka Banja, although this is not the case in Novi Sad. Because visitors gave almost the same ratings for all items, including WiFi, which is one of the higher-rated ones in Novi Sad, it did not stand out in further research because there was no correlation between the item and the others, i.e., it was not distributed among the variables.

When it comes to the dimension of the importance of technology in Novi Sad, online maps, online access to information and availability of weather forecast applications received the highest average rating. This is understandable, given that tourists nowadays rely much more on independent travel itinerary planning and these benefits are especially important to them in those situations. Among the less important items, augmented reality, call-service center and electronic-entrance guard system stood out. The most important technologies from the perspective of visitors in Vrnjačka Banja are free WiFi, online reservations, and weather forecast applications. It is somewhat similar to the previous findings, where the importance of the information availability is once again emphasized, both at the destination and during travel planning. Tourists consider QR codes, tourist-flow monitoring and augmented reality to be the least important. These, as well as previous results, indicate that tourists are still not sufficiently familiar with Web 3.0, and therefore not with Web 4.0 technology (Kurgun et al. 2018), which has the largest impact on enhancing the tourist experience. It was particularly important to analyze preferences for individual technologies, precisely for the purpose of identifying weaknesses and strengths and understanding the current conditions for the development of smart tourist destinations. Author Wang et al. (2016) suggested in their research that it would be significant to consider ICT adoption in different types of destinations. This was one of the starting points of this research, considering the importance of ICT in tourism and the fact that satisfied tourists make the destination more competitive. It was determined that the level of development of tourism services based on ICTs is relatively low, according to the results of the average ratings of tourist preferences.

Although in the case of Novi Sad, the level of adopted ICT is partially higher compared to Vrnjačka Banja, as evidenced most clearly by the mean scores, both destinations should equally focus on weaknesses, that could be strengthened to improve the overall experience. To begin with, this can be achieved by improving the services that are provided through already existing ICT, and which have been positioned in field M (1,2). This primarily refers to applications that can provide tourists with some general information, help with travel planning or related to activities at the destination itself. In this context, online maps, websites of tourist attractions, mobile applications, applications for general service information (e.g. weather forecast), user recommendations on websites and online access to information are distinguished for both destinations. In addition, some of the offers that need to be further improved are online booking, free Wi-Fi, smart emergency response system, traffic-safety protection, electronic ticketing system, mobile payment, guiding-information service, virtual travel

community, smart environment, festival-activity forecast and short messages and multimedia messages service.

CONCLUSION

Novi Sad, after Belgrade, is the city center with a high concentration of tourists, which has been steadily increasing in recent years. On the other side, Vrnjačka Banja is the most popular spa town in terms of tourist turnover, and in addition it is highly ranked in the Tourism Development Strategy of the Republic of Serbia for the period 2016-2025, according to the criterion of developed infrastructure and superstructure. However, Vrnjačka Banja still does not have a developed information and communication system in tourism with appropriate ICT tools, which can be partially confirmed for Novi Sad as well. Nevertheless, this is one of Serbia's weaknesses in general, where it is still difficult for small and medium-sized businesses to establish platforms that can support the development of innovative tourism products and services. ICT-based tourist services are considered significant by visitors, however they do not believe Novi Sad and Vrnjačka Banja have an adequate ICT infrastructure for the tourism industry. Based on the internal and external barriers that occur in the adoption of technologies in the destination, as stated by Wasan (2014), it is concluded that DMOs and tourism companies still have a limited understanding of ICTs. On the other hand, the general conclusion is that ICT-based offers in Novi Sad and Vrnjačka Banja are rated rather poorly, when looking at individual items. Therefore, it can be said that the level of adoption of ICT is relatively poor. On the other hand, when examining individual ICTs, the general conclusion is that ICT-based offers in Novi Sad and Vrnjačka Banja are evaluated relatively low. ICT adoption is therefore considered to be at a rather low level.

Among the problems it is the higher initial costs for the implementation and management of the infrastructure, which slows down the implementation of ICTs. By analyzing weaknesses and strengths, it is possible to determine what should be prioritized in development, and based on the tourists' preferences focus on the implementation of certain technologies. First of all, the services provided by already-existing ICT that are located in field M (1,2) should be upgraded. This includes applications that can provide tourists with some general information in all stages of the traveling. Special attention should be paid to the fact that tourists create their experience from the moment of planning their trip, visiting the destination and ending with their return home, when they share data through social media. It helps DMOs interact and build relationships with travelers. In addition to the aforementioned, the analysis of weaknesses and strengths can especially provide insight into what is considered more and what is less important for the overall experience and satisfaction of tourists in order to improve the tourist experience. Visitor satisfaction must be one of the goals of visitor management, and this can be achieved through ICTs. It is an important guideline for DMOs to provide personalized experiences, which is what most of today's tourists strive for.

Despite the fact that Serbia has acknowledged the potential and benefits of using ICT in the tourism industry, as evidenced by data from the World Economic Forum and the implementation of certain applications, more work needs to be put forth through systematic actions in order to improve the tourism sector's competitiveness. In order to

maintain the competitiveness of tourism, it is important to focus on comparative advantages, as the basic values of the target market. This means improving the image of the destination, as an important impression that people have about the destination. More accurate measures of destination competitiveness can be established as knowledge of destination values and the links between tourist preferences grows. One of the key elements in the evolution of traditional tourist destinations towards smart tourist destinations is ICT, as a basic management tool. Today, thanks to the driving role of smart technologies, the image of a destination can be significantly improved. Certainly, it should be emphasized that the entire process is unthinkable without human capital. Therefore, in smart competitive destinations, the emphasis is on the ways in which these destinations enable the co-creation of the tourist experience and the personalization of the experience. It can be said that tourists are the ones who boost the destination's competitiveness through interaction, sharing and making better decisions using ICTs.

This study provides DMOs with practical insights to understand the preferences of tourists towards smart technologies in order to improve the tourist experience in the future. Further, to understand the advantages of smart tourism as an important direction in improving competitiveness. Future research may focus on the issue of tourists' behavior in relation to smart technology use. It could examine how smart tourism technology affects traveler experiences and their revisit intention to smart tourism destinations. Additionally, with the aim of analyzing the tourist experience, it would be interesting to examine the relationship between smart technologies and consumer behavior through all three stages of travel (-pre, during and after travel) in order to gain a better understanding of the value and usefulness of technologies in different environments. Future research could open another question from the aspect of tourists' behavior related to the way of use, that is, the misuse of technologies and how this can affect the planning of the technological development of the tourist destination.

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