

## INFORMATION AND COMMUNICATION TECHNOLOGY AS A DRIVING FORCE OF CHANGES IN TOURISM

Snežana ŠTETIĆ, Dario ŠIMIČEVIĆ,  
Snežana MILIČEVIĆ

**Abstract:** *Modern technologies, primarily information and communication technology (ICT), have a leading role in determining the future direction and pace of the tourism industry development as well as the establishment of new relations in the tourism market between supply and demand sides. Influences of modern technologies on tourism development and its forms are numerous and strong. This is reflected not only through the reservation systems and distribution channels, which are among the first to use the opportunities of modern technology in tourism industry, but also through increasingly stronger presence of ICT in different aspects of the tourism industry and tourists' behavior.*

*This paper focuses on the impacts of ICT on the formation of new relations and emergence of new phenomena in the tourism market, changes in the tourism industry as well as changes in the tourists' behavior and decision-making process. Networking is a word that will designate the development of tourism and tourist destinations in the coming period. Thus, in this paper, special emphasis will be put on interrelations of information, technology, tourism and people (tourists) in any place at any time.*

**Keywords:** *information and communication technology, ICT, social media, tourism industry, tourism market, changes in tourism*

### Introduction

Modern tourism market has been continuously, constantly and intensely changing in quantitative and qualitative terms. Changes need to be completely recognized in order to anticipate future trends and developments in the tourism market, to encompass all the factors, external and internal, which affect all occurrences in the global tourism market. (Štetić et al. 2014) In this sense, the development of modern technologies has introduced a series of changes in the tourism market that are manifested on both, tourism offer and tourism demand (Januszewska et al. 2015; Buhalis & O'Connor, 2005). Some authors emphasize the importance of these changes in the overall tourists' experience before, during and after the trip (Mihajlović, 2014; Pease & Rowe, 2005; Atembe & Akbar, 2014; Bojnec & Kribel, 2004; Buhalis & Law, 2008). Along with the development of technologies, new activities have also been developed in tourism affecting modified classic tourist experience or even an emergence of new tourism experiences based on new technologies. Neuhofer et al. (2014)

see the role of technology in new tourist experience as **a mediator in the sensation of new experience** and/or **as a basis for new experience over which it is created**.

In this regard the development of information and communication technology (ICT), which has a long history of application in tourism (from the first booking system), and which is easily accepted by both tourists and tourism companies as well as by tourist destinations, is particularly important (*Aramendia-Muneta & Ollo-Lopez, 2013; Ficarelli et al. 2013; Bethapudi, 2013; Spencer et al. 2012*). Interestingly, when it comes to the development of information and communication technology, the more powerful and complex it becomes, the easier and more accessible it is to use, which affects the increasing use by enterprises, organizations and individuals (*Buhalis & Law, 2008*). ICT affects the future of world tourism in two ways (*Milenković, 1999; Buhalis, 2003*):

- at **micro level** it connects the whole company and enables effective and efficient management and
- at macro level it enables a diagonal integration of the tourism industry by improving the production, distribution and sale of a complex tourism product.

No wonder that today ICT is deeply integrated in the process of creating tourism services, marketing activities, sales, tourists' notification and activities. The tourism industry has been forced to develop new sales channels, i.e. new distribution and communication channels with the market, especially taking into consideration that the nature of a tourism service is not tangible and physically present at the time of decision-making and purchasing, (*Hadžić, 2004*). In this regard ICT has imposed as a cheap, accessible and logical solution.

So far three significant innovations within the information and communication technology have influenced the redefinition of the organizational structure in the global tourism industry. These are (*Shanker, 2008; Pease & Rowe, 2005*):

- **the development of computerized reservation systems (CRS)** as the first globally present information application,
- **the development of global distribution systems (GDS)**, and
- **the development of the Internet** as a new platform for tourism companies business and tourism destinations management.

Perhaps the most significant change in the tourism industry business operations and the consumer behavior in tourism is enabled by a rapid development of the Internet. Today the Internet is not only a portal toward tourism enterprises and destinations but also a platform for both, their entire business operations on one side and a source of information about a trip, helping tourists with decision-making, planning and paying for it on the other side. The application of ICT and the increasing use of the Internet in tourism industry business operation should not only facilitate communication with customers

and business partners, but it should also ensure the future success at the tourism market (Čavlek, 2006), and overlooking this fact and avoiding or delaying the use by tourism entities will lead to their eventual decay and disappearance. This becomes increasingly apparent taking into consideration that 81% of travellers in the United States used the Internet to plan and search for travel information in 2012, and even 82% of the tourists used the Internet looking for a package arrangement (Kayani, 2014). The same year, in Europe, the European Commission published a report entitled "Attitudes of European Towards Tourism", in which an analysis of the behavior of European tourists during their holiday was presented. On that occasion, it was shown that about 53% of Europeans used the Internet as the main assistance in organizing their holiday, which is two and a half times more than traditional agencies and tour operators as a way to organize holiday with "modest" 23% of share (Ficarelli et al., 2013). Thus, more conservative Europeans are increasingly resorting to the benefits of ICT in the planning and booking their trips.

According to the aforementioned, the Internet has strongly influenced the changes within distribution channels in the tourism market. Former linear distribution channels, within which services were distributed to consumers through intermediaries such as travel agencies and tour operators, have suffered strong structural changes (Mihajlović, 2012). Therefore, they are increasingly leaving their job to modern distribution channels with the Internet as a central point to which service providers, tourism destinations, travel agencies and tourists are linked. Travel agencies and tour operators have become the creators of the overall consumers' tourism experience integrating on-line booking and payment for tourism services, comparing a large number of suppliers of tourism services and choosing the most favourable ones by their quality and price, exchanging consumers' experiences from some of their trips and information on tourism destinations (Buhalis & Law, 2008). E-travel agents and e-tour operators such as e-expedia.com, lastminute.com, and travelocity.com have already taken over the primacy, both in the domain of individual services, as well as in the domain of package arrangements that they offer to their customers.

With a rapid development of the Internet and the emergence of Web 2.0, which has enabled the development of social networks and virtual worlds, tourists are able to estimate the destination before they physically travel to it. Social networks that enable people to experience a destination through the impressions of other consumers, of both, those they know and completely unknown are extremely prominent (Neuhofner et al., 2014). Social media that have not only an increasing influence on decision-making by the users, but also an increasingly important role as new distribution channels are even broader concepts. Technology of social media involves many different forms, and the classification in which six types of social media can be distinguished as a typology of social media can be taken into consideration (Minazzi, 2015: 5-6):

- collaborative projects
- blogs and micro-blogs,
- communities by their content,
- social networks,
- the world of virtual games, and
- virtual communities.

Leaving aside more thorough explanation of certain types of social media in this paper, still it should be noted here that basically they all have interactive character and that they enable communication on a variety of topics among users in real time. Social networks might be the most important part of social media for tourism, and in January 2017 fifteen leading social networks counted about 9.17 billion users (<http://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/>).

However, the influences of modern information and communication technology exceed the benefits that are provided for tourism market by the Internet. *Apulu & Latham, (2011)* point out that these advantages primarily reflect in the management of tourist companies and destinations, and they include *strategic management, communication and cooperation, access to consumers, adoption of management decisions, database management and knowledge management* through more effective productivity of organizations and delivery of services.

### Literature review

Rapid development and omnipresence of ICT have a significant impact on modern development of tourism and tourism market (*Pease & Rowe, 2005; Buhalis & Law, 2008*) changing the way people, companies and organizations are now working (*Apulu & Latham, 2011; Petti & Passiante, 2011; Shanker, 2008; Bojnec & Kribel, 2004*) and introducing innovative forms of business operations (*Mihajlović & Krželj-Čolović, 2014*). Owing to ICT, global changes in the method of doing business in tourism have occurred, and they have created not only many new opportunities but also business challenges (*Aramendia-Muneta & Ollo-Lopez, 2013; Buhalis, 1998*).

In order to be fully aware of the changes that ICT is generating in tourism today, it is necessary to understand what ICT means and in what ways it can affect the events and relations in tourism. Numerous authors have tried to give a comprehensive definition of ICT and here are some of the most specific and most commonly used:

- *Apulu & Latham (2011)* define ICT as "any tool that facilitates communication process and transmits information and shares knowledge through electronic means".
- *Buhalis (2003)* says that it is quite difficult to define ICTs because they include not only hardware and software but also telecommunications,

NetWare, groupware and HumanWare. Based on this he defines ICTs "as the entire range of electronic tools that facilitate the operational and strategic management of organizations by enabling them to manage their information, functions and processes as well as to communicate with their stakeholders, enabling them to achieve their mission and objectives".

- *Januszewska et al. (2015)* say that "ICT represents the technology required for information processing and transfer: innovative tools which form an integrated system of software and networked equipment that facilitates data processing, information sharing, communication, searching and selecting from the existing range of products and services used for an organization's benefit".
- *Shanker (2008)* concretizes these definitions and shows that ICT has many forms, such as "Cell Phone applications (SMS), Digital Cameras, Internet, Wireless (Wi-Fi and WiMAN), VOIP, GPS, GIS, Convergence (data, voice, media), Digital radio, etc.", and that thanks to this we are in the time of "new information economy which is digital in nature" today.

It can be concluded that ICTs are a set of equipment or tools based on the same technology that communicate with each other through software solutions and platforms in order to collect, process and share information that are of importance to their users for the purpose of making decisions and taking actions. Interestingly, when it comes to the development of ICT, the stronger and more complex it is, the easier to use and more accessible it becomes, which affects its increasing use by organizations and individuals (*Buhalis & Law, 2008*). This is why ICT has significant implications for the tourism industry, destinations and tourists bringing many benefits to each of these groups. As for the tourism industry and destinations, ICTs today represent a way of gaining competitive advantage and a better competitive position at the tourist market (*Mihajlović & Krželj-Čolović, 2014; Buhalis, 1998; Buhalis & Law, 2008; Buhalis & O'Connor, 2005*). As one of the main sources of competitive advantages, and a better competitive position of the economy and destinations using ICTs *Buhalis & O'Connor (2005)* state an increase in profitability as a direct result of the use of ICTs in planning and business operations management. The fields where they can achieve increased profitability are:

- **managing revenues** based on accurate forecasts of demand and therefore fluctuations in vacancies and/or prices,
- **providing a global presence in the tourism market** by building awareness among consumers and promoting through the use of ICTs,
- **using ICTs as the distribution channels** through which direct contact with consumers or new e-intermediaries will be provided which results in lower operating costs and revenue increase,

- **reducing operating and communication costs** through the integration of operating systems within an organization which eventually leads to reduced costs of space and manpower?
- **disintermediation and reduction of intermediaries' costs** through enabling online servicing of end users using ICTs.

These fields do not lead only to reduced costs, i.e. increased revenues, but also to the efficient management as one of the conditions for obtaining a competitive advantage. Thus, the use of ICT in all business segments facilitates the activities that are prerequisites for task coordination and function performance in an efficient and effective way (*Mihajlović & Krželj-Čolović, 2014*). Closely associated with the increasing competitiveness and improving business performances through the use of ICTs is the term networking. **Networking** is characterized by the development of tourism and tourist destinations in the coming period through the unity of information, technology, tourism industry and people (tourists) in any place at any time (*Štetić & Šimičević, 2014: 216; Buhalis & O'Connor, 2005*). Networking allows the formation of such strategic partnerships offering complementary supply and outsourcing of non-core functions through specialized vendors. In such a way both, virtual cooperation and dynamic personalization of services are achieved, and the destiny of those who were once considered competitors is also shared. An example of this is the global bases of tourism services that provide solutions to tourists for the basic elements of their travel on the given criteria with simultaneous sale and collection of selected elements of a trip.

In addition to increasing the tourism industry competitiveness, the use of ICTs in management and business operations also has a series of positive effects on the destination management. This directly influences the increased competitiveness of destinations which use it. Increasing the destination competitiveness by using ICTs is achieved through (*Petti & Passiante, 2011*):

- **reducing operating costs** by switching from paper to digital forms of promotion,
- **shortening the time** needed for the collection and analysis of tourism, i.e. market data,
- **increasing the quality** through regular data updating, which affects the increase of confidence by the users (business and private)
- **increasing the effectiveness** of action enforcement based on timely data collection and analysis (e.g. through targeted promotional campaigns) etc.
- **providing additional revenues** by booking commissions through destination web platforms and selling of services like training, production of ad hoc studies and statistics, consultancy and assistance for e-marketing activities, etc.

It is expected that, for the sake of maintaining and improving competitive position, the tourism industry and destinations will further strengthen promotional and communication activities creating individual marketing campaigns and one-to-one marketing through the Internet and other means of communication created by the development of ICTs. Consequently, they will improve and boost the use of software for learning and tracking consumer behavior, in order to obtain extensive insights into individual preferences and schemes of tourists' behavior (*Štetić & Šimičević, 2014: 215*).

The development and comprehensive presence of ICT has also brought a number of advantages to tourists. Due to this fact, they become co-creators and not only consumers of a tourist experience. Not only can tourists today reach timely and accurate information necessary for planning trips but they can also take actions in order to book and pay for certain services or package arrangements (*Buhalis, 1998*). In addition, ICT has allowed tourists to outgrow the role of ordinary consumers and put them in the center of experience creation and sharing information with the rest of the market. Sharing information with multimedia contents and tourists' experiences on destinations through social networks, mobile applications, etc. (*Štetić & Šimičević, 2014: 215*) has made tourists become centers of information and co-creators of experience (*Binkhorst, 2005*). However, it also leads to technology-enhanced tourist experiences (*Neuhofner, 2014*). ICTs that are available to tourists are diverse and they range from mobile platforms (smart phones, tablets, laptops, etc.) with installed or downloaded software solutions and applications from the Internet and social networks to smart devices.

### **The Internet, social media and tourism**

Today's global society is largely permeated with technology and information and their mutual relations, and tourism can be added to this (*Corigliano & Baggio, 2004*) as the third component of the global society which is strongly linked to ICTs (*Baggio & Del Chiappa, 2013*). This corresponds to the nature of tourism as a global phenomenon. The emergence of Web (World Wide Web), i.e. the Internet as a multidimensional medium and hypermedia environment has allowed users communication, interactive access to contents and mediation among the participants at the tourism market (*Al-Kassem & Nassuora, 2012; Cohen et al., 2014; Šimičević & Nicić, 2008*). It has enabled the connection between these three components of the global society. The Internet as a network of all networks have undergone a real revolution, from Web 1.0 in the early 1990s through Web 2.0 in the 2000s (*Neuhofner et al., 2014*) to the beginning of the development of Web 3.0, which is currently being developed (*Štetić & Šimičević, 2014: 210*). The Internet has become a unique interactive environment or "e-community" in which information are exchanged, products are sold, payments are made and attitudes of organizations and individuals are

broadened, and since it is based on Web 2.0 technology, we can simply call it Travel 2.0 (*Ficarelli et al., 2013; Buhalis & Law, 2008*).

The number of Internet users is increasing at an astonishing pace, so that today in certain European countries there is a phenomenon that over 4/5 of the population is connected via the Internet i.e. they use the Internet. This percentage ranges from 70% in France to 97% of the total population in Norway (*Mihajlović & Krželj-Čolović, 2014*). On the other hand, in the research conducted in five southern European countries which are traditionally receptive countries, the Internet as a source of information for the selection of a tourist destination has taken the second place, immediately after recommendations from relatives and friends (*Ficarelli et al., 2013*). According to EUROSTAT research, 55% of all trips of EU citizens in 2014 and 24% of transport was reserved online. Additionally, 39% of EU citizens between 16 and 74 years of age used the Internet for purposes related to travel in 2015 (50%, if we take into account only those that are Internet users), and 65% of them ordered or purchased services related to tourist travel ([http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics\\_on\\_ICT\\_use\\_in\\_tourism](http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_ICT_use_in_tourism)). Based on these data it is possible to deduce how much market potential the Internet has today.

Rapid development of the Internet based on the Web 2.0 protocols has led to significant structural changes in the tourism market, which are the most noticeable in the disappearance of traditional intermediaries in tourism (*Buhalis & Law, 2008; Buhalis, 2005: 234*) and their replacement with e-intermediaries (e-tour operators and e-agencies), i.e. online intermediaries (*Buhalis, 2005: 239-241; Werthner & Klein, 1999; Bern et al., 2015; Bethapudi, 2013; Buhalis & O'Connor, 2005*). In addition to the introduction of e-intermediaries, other changes brought about by the emergence of the Internet can also be identified, such as: an increase of direct sales to consumers allowed by the possibility of direct access to distribution channels through the Internet; the ability to easily change and/or adjust products and services to the needs and expectations of consumers based on the interaction via the Internet; more transparent and more effective relationship between consumers and management; and changes in consumers' behavior, who are more specific in their requirements regarding the content of services and travel and who more often tend to compare prices (*Shanker, 2008*).

The above mentioned changes related to tourism offer and tourist demand and caused by the Internet have also led to a number of benefits for both, enterprises and destinations as well as for consumers i.e. tourists. The Internet is an extremely useful tool and an opportunity for the tourism industry to bridge the gap between supply and demand, through closer communication and interaction (*Buhalis, 2003*). Benefits for the tourism industry resulting from the use of the Internet in business operations are reflected in (*Pease & Rowe, 2005*):

- the ability to turn ideas into marketable innovation for a wide range of customers, with reduced buyer search costs and costs of access to markets;
- increased speed to market and access to new product offerings via the Internet;
- changed processes and the sharing of information within and between organizations;
- the opportunity for easier customization of services and processes;
- improved interoperability through the use of internal and external applications.

On the other hand there are a number of advantages for tourists which are reflected in (*Kayani, 2014; Pease & Rowe, 2005; Christou & Nella, 2012: 139*):

- a shift in the balance of power between suppliers and customers due to the increased availability of information;
- a simplified process of information retrieval, travel planning and purchase;
- time saving directly associated with the possibility of online search and online payments;
- a possibility of quick price comparison with online intermediary and direct service providers;
- a possibility of comparison results in favorable prices, a number of discounts and upgrades to basic services.

Due to the development of Web 2.0 technology, besides the Internet, a real boom of social media has appeared. Using social media users are networking and connecting through different desktop, mobile and smart devices into the community where they can share video, image and text contents and databases. Unlike the traditional media that support one-way communication, social media support two-way communication via Web 2.0 technologies and "as the digital version of word-of-mouth, social media include the solidification, storage, and retrieval of word-of-mouth content online " (*Pan & Crofts, 2012*). There are several different types of social media (in the introduction to this paper, a typology of six types of social media is given), but regardless of this, certain characteristics that are common to all social media may be singled out. These are (*Obar & Wildman, 2015*):

- Social media services are (currently) Web 2.0 Internet-based applications;
- User-generated content is the lifeblood of social media;
- Individuals and groups create user-specific profiles for a site or app designed and maintained by a social media service;
- Social media services facilitate the development of social networks online by connecting a profile with those of other individuals and/or groups.

The most popular type of social media, social networks, i.e. Social Network Sites (SNS) “as web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system” (Boyd & Ellison, 2007). “Social networking focuses on building online communities of people who share interests and activities, or who are interested in exploring the interests and activities of others” (Nusair et al., 2012). The increase in availability of mobile platforms and smart devices has provided their significant use in social networking through applications developed for this type of devices. Social networks with the largest number of users are Facebook (1.87 billion), applications WhatsApp and Facebook Messenger with 1 billion users. It is interesting that the largest three social networks are owned by Facebook, and that on the 4<sup>th</sup> and 5<sup>th</sup> place, with over 800 million users (<http://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/>), are the most numerous Chinese instant messaging (IM) platform for PC and mobile and Weixin / WeChat which combines IM and entertainment, and both are owned by Tencent, that is the leader in the field of Internet services in China and the Asia-Pacific region (APAC) (<https://www.tencent.com/en-us/index.html>). Thus, five most numerous social networks have over 5.6 billion users.

The importance of social media for tourism management lies in the proper understanding how they are perceived by tourists and how they can affect the perception, decisions and behavior of tourists (Cohen et al. 2014). Finally, these are the media on which the contents are posted by the users themselves (Pan & Crofts, 2012). It is therefore necessary to develop and invest in Social Media Marketing (SMM), which upgrades classic marketing mix, and focuses on the users of social media activating them through their interests and making communication with them interactive, collaborative and continual (Ge, 2014). Additionally, activities of SMM must be interesting, recognizable, updated, shareable, related to the topics of interest of the target group and focused on actions that should be taken by social media users.

When it comes to travel it should be noted that users of social media use them to **search for information and post information**. These two processes are linked because the information needed by users are obtained not only at the profiles of other users who post information in the form of photo and video materials or comments related to their journeys, but also following brands (about a quarter of social media users in the USA who followed brands followed the tourist brands) (Yoo & Gretzel, 2012). The reasons why tourists use social media are very diverse, such as venting negative feelings, platform assistance, concern for other consumers, extra-version and positive self-enhancement, social benefits, economic incentives, helping the company and

advice seeking, moral obligations, reciprocity to other users, social and ego-driven etc. (Parra-Lopez et al. 2012). Evidently, the reasons to participate in social media are directed towards themselves, towards others, towards society as a whole and towards service providers.

Travel blogs should be taken into account as an important form of social media which are “free, public, web-based entries in reverse chronological order presented in a diary format style ” (Volo, 2012). Travel reviews that can be found on blogs act as a community where consumers connect and become involved with one another (Crotts et al. 2012). There are four types of travel blogs (Volo, 2012), and those are:

- Consumer-to-consumer (C2C) as a widely spread form of blogs used for sharing tourism experiences and to communicate with family and friends thus creating electronic word-of-mouth;
- Business-to-business (B2B) blogs where stakeholders can communicate industry trends, technological developments, research findings or marketing tips;
- Business-to-consumer (B2C) or corporate blogs in order to communicate companies’ offerings and to foster relationships with customers, and their content is created in-house or by professional bloggers;
- Government-to-consumer (G2C) which are created by destination marketing organizations (DMOs) to communicate with their target market.

We can expect further development of SMM communication and their use in targeted one-to-one marketing as the dominant form of communication with the users of social media. Excessive advertising and paid campaigns on social media should be avoided, and we should more insist on pull strategies through which users will be attracted to tourism companies and destinations by interesting content and adequate information.

### **Tourism is going mobile**

The development of Web 2.0 technology and social media development based on it was also followed by the development of smart technologies and smart mobile devices. The development of mobile phones based on smart technology that became available to almost every user on the planet is especially important. Today “Mobile phones have evolved into “smartphones” that are fully functional computers” (Wang et al. 2014). Due to the development of nanotechnologies and the processor industry, mobile phones have become a combination of computers, tablets and phones. The development of technologies such as Global System for Mobile Communication (GSM), Wireless Application Protocol (WAP), General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS) as well as Bluetooth, Wireless Local Area Networks (WLANs) allow users to connect devices to the Internet through a

wireless radio connection (WiFi). Since Wi-Fi has a limited radius from several meters to about 100 m, Worldwide Interoperability for Microwave Access (WiMAX) is developed, which has a much wider coverage area of up to 30 or more miles and thus enables users to connect to the Internet more easily (*Buhalis & Law, 2008*). The significance of mobile phone use for tourism arises from its wide use and expectations that the latest generation will book most of their travel via mobile phones (*Ficarelli et al. 2013*).

Today mobile phones are a necessary, even indispensable tourists' tool during their journey through which they obtain information and from whom they seek assistance when traveling. Mobile phone is a tool that allows them access to their passport, money, travel guides and reviews, maps, social networks and much more as mobile technology continues to develop. Especially important is the development and widespread application of geolocation-based Augmented Reality (AR) applications ([https://www.tourismni.com/globalassets/facts-and-figures/tourism-intelligence/intelligent\\_vision---tourism-in-the-midst-of-a-mobile-revolution.pdf](https://www.tourismni.com/globalassets/facts-and-figures/tourism-intelligence/intelligent_vision---tourism-in-the-midst-of-a-mobile-revolution.pdf)) through which tourists get real-time information on the place where they are located. In the research conducted by *Wang et al. (2014)* 25 ways in which tourists use their mobile phones in relation to travel were identified, from regular calls and sending messages through listening to music, reading news, watching videos, sharing contents on social media, to checking the availability of tickets and check-in time for their flight, browsing information about hotels, restaurants and other available offers before and during the trip. In addition, it was found that 14 basic motives drive tourists to use their smartphones while traveling, such as being connected / informed, use of social networks, search for food, security reasons, transport, accommodation, way to spend free time during the trip, search for additional value, isolation from others, habits, killing time. Using mobile phones for travel purposes has experienced a real boom in recent years. Thus, in the period from 2011 to 2015 the number of reservations for travel-related services increased a staggering 1,700%, making 18% of online revenue (<https://www.treksoft.com/en/blog/travel-tourism-stats-2016>). According to the research of one of the largest travel sites TripAdvisor in 2015, even today 42% of passengers use mobile phones for planning and booking trips. In addition, their research also showed that ([http://ir.tripadvisor.com/release\\_detail.cfm?Released=919990](http://ir.tripadvisor.com/release_detail.cfm?Released=919990)):

- Connected Travelers (those who have used a smartphone to plan or book a trip) are twice as likely as all other travelers to make travel-related bookings via a mobile device: 12% of Connected Travelers booked their accommodation via a smartphone, as compared to 6% of travelers overall;
- 45% of Connected Travelers say they "usually" use their smartphones to book activities for a trip;

- 72% of Connected Travelers use their smartphones to look for restaurants while on vacation and 64% use it to read reviews;
- 34% of Connected Travelers want their accommodation to offer mobile check-in;
- Connected Travelers are far more likely to see their smartphones as a booking device, both before a trip and while in-destination;
- 45% of Connected Travelers say they use their smartphone to book activities for their trip, while 55% say they use a laptop;
- 28% of travelers overall use their smartphone to book things to do before a trip;
- 8% of all respondents booked their accommodation using a mobile app channel, up from 4% in 2014;
- 20% of Connected Travelers say they booked via a mobile app because it was easier or faster to access and 29% felt they got a better price.

In order to serve mobile phone users as much as possible and to maximize the use of this distribution channel, tourism management is developing an increasing number of applications for mobile phones that allow users to connect with them and their activities more easily and quickly. The general trend in introducing and increasing mobile phone applications started after the introduction of the first iPhone application, iTunes, and this was followed by the boom on phones with Android technology (*Wang et al. 2014*). This trend has not bypassed tourism. For the first time Smartphones has introduced a mass use of AR through AR applications for mobile phones into the market. These applications operate in such a way that a tourist directs their phone at an object in real space, and then information about the object appear on the phone screen. To make this work, the phone must be connected to Global Positioning System (GPS). DMOs use these applications to provide information on a variety of contents and attractions in the area through geo-referenced content (*Yovcheva et al. 2012*).

The next stage in the application of mobile phones in tourism is the Internet of Things (IoT) that “extends into the real world embracing everyday objects and where physical items are no longer disconnected from the virtual world, but can be controlled remotely and can act as physical access points to Internet services” (*Mattern & Floerkemeier, 2010*) or any other service. IOT will have a major impact on all aspects of life and consumer behavior in the future (*Atzori et al. 2010*). The concept of IoT has already been applied in hotels and restaurants where, via their mobile phones, guests can connect with a variety of "things" in the hotel rooms and restaurants, where automation of certain actions is carried out and the behavior of guests is predicted ([http://www.ifema.es/fitur\\_06/Prensa/Noticiassectoriales/INS\\_047598](http://www.ifema.es/fitur_06/Prensa/Noticiassectoriales/INS_047598)). The role of this connectivity ranges from providing ordinary entertainment to including a

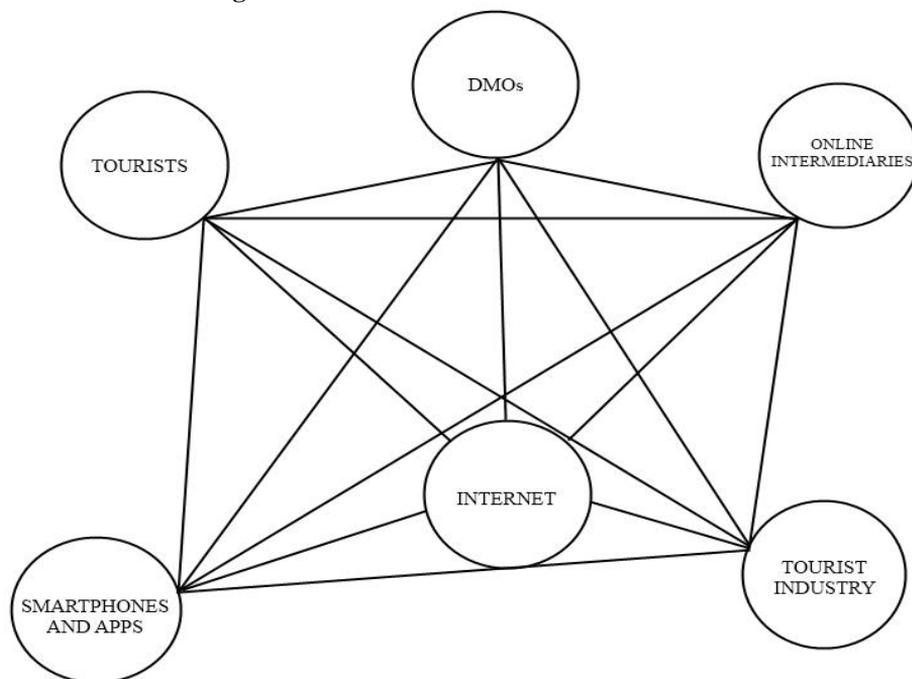
guest into certain aspects of service provision, thus customizing and accelerating service process.

In the next period mobile phones and other devices will increasingly be used for the distribution of tourism products and services together with strengthening the role of applications for these devices in informing and communication with customers, in sales and charging tourist services (*Štetić & Šimičević, 2014: 217*).

**ICT communication model in tourism**

Based on the above mentioned it can be concluded that patterns of behavior of all stakeholders in the tourism market have been altered, which also leads to altered communication and distribution channels. From the traditional linear distribution and communication channels, the focus has now moved to a multi-nodal system of communication and distribution that does not have a central point, i.e. focus, but it is based on Web 2.0 technology, which provides a constant interactive communication among all participants in the supply and demand side. Figure 1 shows a new model of communication in tourism based on modern technologies, which already operates and which can be expected to develop even more in the future.

**Figure 1. ICT communication model in tourism**



*Source: Authors*

Since the previously applicable linear model of communication is out of date and that the further development of ICTs will enable more diverse communication possibilities, two significant changes in the tourism market can be expected. The first one is further development based on ICT. Those companies and destinations that continue to ignore facts and leave out full implementation of ICT in their business operations are likely to disappear from the market. This will not happen because the application of ICT is a possibility, but because it is the only option available to them if they want to continue their business. Moreover, tourists (as the aforementioned data has shown) switch more and more to the complete collection of information, bookings and payments using the latest ICT solutions. The reason for this is much easier use of these solutions in tourism and at the market as a whole. The second change that can be expected is that the model of communication will continue to evolve rapidly, and it is likely that it will include a number of new channels of communication and distribution that have not yet been fully implemented and/or developed. An example of this is also IoT as a new channel of communication that is rapidly being introduced into tourism.

## **Conclusion**

Modern tourism market is in the process of major changes caused by the rapid development of ICTs that allow us that kind of connection and interaction which could not have been imagined until now. These changes are noticeable both, in the context of tourism industry and destination management as well as regarding the tourist demand. It could be concluded that the new relations in the tourism market have still been established encouraged by these changes and that they have not been fully constructed yet. Also, in accordance with the upcoming development of ICTs, it can be expected that these relations will continue to develop dynamically without a final steady state due to the tendency that the ICT solutions are constantly developing, improving and changing.

Great importance for the rapid development and application of ICTs, its hardware and software solutions for all aspects of business, information, reservation and payment is the transition to Web 2.0 technology, which has finally enabled interactive connection of all participants. Thus, not only the communication and provision of information are facilitated by tourists, but also the communication between the tourism industry and internal communication within the organizations is made easier. All these facts together have had a huge impact on the collection and processing of business information, reduction of costs and acceleration of business operations with maximum customization of tourism products to tourists' demands. The final result are reduced total operating costs and increased revenue, which has had a positive impact on the competitiveness of organizations that have fully implemented ICTs in their business. Organizations that base their business on traditional marketing mix

instruments and distribution channels have become the dinosaurs with inevitable and fast approaching end which can be avoided only through ICT evolution. The most obvious example of evolution are intermediaries in tourism that have evolved in e-intermediaries while the traditional ones are disappearing at an accelerated pace.

Also, tourists have experienced numerous benefits of applying ICTs in tourism, primarily through easier access to numerous information and comparability of all factors relevant to the planning and organization of their journey. With the development of smart mobile phones that have integrated the functions of computers and phones with practically constant Internet access tourists have the possibility to change any element of their journey immediately and on the spot, i.e. during the trip. The possibility of obtaining information in real time and space, online reservations and immediate payment of the booked services, tourists have got complete freedom and the opportunity to be the masters of every aspect before, during and after their travel. Through social media, tourists have become the ones who inform, advise and suggest other tourists, affecting their decisions about journeys that they should take more than ever before. With the possibility of online selection of each travel element, tourists have become the creators of their experience during this trip. Thanks to ICTs and user-friendly modern ICT solutions, tourists have become real masters of the tourism market. The next period will show the direction in which ICTs will develop, but it is reasonable to assume that it will continue to go in favor of tourists and their position in the distribution channels.

## REFERENCES

- Al-Kassem, Amer., and Nassuora, A. Bassam. "The relationship between Internet usage and the marketing of tourism in Jordan", *International journal of Economics and Management Sciences*, 1(7), 2012, 75-79.
- Apulu, Idisemi, and Latham, Ann, "An Evaluation of the Impact of Information and Communication Technologies: Two Case Study Examples", *International Business Research*, 4(3), 2011, 3-9.
- Aramendia-Muneta, M.Elena., and Ollo López, Andrea. "ICT Impact on tourism industry", *International Journal of Management Cases*, 15(2), 2013, 87-98.
- Atembe, Roland, and Akbar, Bilal. "Tourists Co-creation Experiences Onsite-Enabled by Mobile Devices", In *eProceedings of the ENTER 2014 PhD Workshop - Information and Communication Technologies in Tourism 2014*, 20-26. Accessed March 28, 2017. [http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings\\_ENTER2014\\_PhDWS-Jan17201411.pdf](http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings_ENTER2014_PhDWS-Jan17201411.pdf)
- Atzori, Luigi., Iera, Antonio., and Morabito, Giacomo. "The Internet of Things: A survey", *Computer Networks* 54 (2010), 2787-2805.
- Baggio, Rodolfo., and Del Chiappa, Giacomo. "Tourism destinations as digital business ecosystems". In *the proceedings of: ENTER2013: 20th International Conference on Information and Communication Technologies in Tourism 2013*, 83-194.
- Berné, Carmen, Gómez-Campillo, Maria, and Orive, Victor. "Tourism distribution system and information and communication technologies (ICT) development: Comparing

- data of 2008 and 2012. *Modern Economy*, 6(2), 2015, 145–152. Accessed March 30, 2017. <http://www.tandfonline.com/doi/pdf/10.1080/22243534.2016.1253281>
- Bethapudi, Anand. “The role of ICT in tourism industry”, *Journal of Applied Economics and Business*, 1(4), 2013, 67-79.
- Binkhorst, Esther. “The co-creation tourism experience”, Sitges: Whitepaper Co-creations, 2005. Accessed March 31, 2017. [http://www.esade.edu/cedit2006/pdfs2006/papers/esther\\_binkhorst\\_paper\\_esade\\_may\\_06.pdf](http://www.esade.edu/cedit2006/pdfs2006/papers/esther_binkhorst_paper_esade_may_06.pdf)
- Boyd, M. Danah., and Ellison, B. Nicole. “Social Network Sites: Definition, History, and Scholarship”, *Journal of Computer-Mediated Communication* 13 (1), 2007, 210-230.
- Bojnec, Štefan, and Kribel, Zvonko. “Information and Communication Technology in Tourism”, *In Intellectual Capital and Knowledge Management*. Proceedings of the 5th International Conference of the Faculty of Management Koper, University of Primorska, Portorož, Slovenia, 2004, 445-454. Accessed March 30, 2017. <http://www.fm-kp.si/zalozba/ISBN/961-6486-71-3/445-454.pdf>
- Buhalis, Dimitrios. “Strategic use of information technologies in the tourism industry”, *Tourism Management*, 19(5), 1998, 409-421.
- Buhalis, Dimitrios. “*eTourism: Information Technology for Strategic Tourism Management*“, Harlow: Prentice Hall - Pearson Education Limited, 2003.
- Buhalis, Dimitrios. “Information and communication technologies for tourism” In *The Management of Tourism*, edited by Lesley Pender and Richard Sharpley, 232-245, London: SAGE Publications Ltd., 2005.
- Buhalis, Dimitrios. and O' Connor, Peter. “Information Communication Technology Revolutionizing Tourism“, *Tourism Recreation Research*, 30(3), 2005, 7-16.
- Buhalis, Dimitrios., and Law Rob. “Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research“, *Tourism Management* 29(4), 2008, 609–623.
- Christou, Evangelos, and Nella, Athina. “Web 2.0 and Pricing Transparency in Hotel Services” In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 133-148, Farnham: Ashgate Publishing Limited, 2012.
- Cohen, A. Scott., Prayag, Girish, and Moital, Miguel. “Consumer behaviour in tourism: Concepts, influences and opportunities”, *Current Issues in Tourism*, 17(10), 2014, 872-909, DOI: 10.1080/13683500.2013.850064
- Corigliano, M. Antonioli., and Baggio, Rodolfo. (2004). “Tourism, technology, information and the relationship with customers”, *Paper presented at the International Conference on Leisure Futures, Bolzano, 10 to 12 November. 2014*. Accessed March 31, 2017. [http://www.iby.it/turismo/papers/baggio\\_leisfut02.pdf](http://www.iby.it/turismo/papers/baggio_leisfut02.pdf)
- Crotts, C. John., Davis, H. Boyd and Mason, R. Peyton. “Blog Content for Competitive Advantage: Lessons Learned in the Application of Software Aided Linguistics Analysis” In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 281-292, Farnham: Ashgate Publishing Limited, 2012.
- Čavlek, Nevena. “Travel and tourism intermediaries” In *International Handbook on the Economics of Tourism*, edited by Larry Dwyer and Peter Forsyth: 153-172. Cheltenham, UK: Edward Elgar Publishing, 2006.
- Ficarelli, Sara, Sendra, Sandra, Ferrando, Laura, and Lloret, Jaime. “Effects of Web Technologies on Tourism Industry in Some Southern European Countries” In

- Proceedings of WEB 2013: The First International Conference on Building and Exploring Web Based Environments*, 2013, 49-56.
- Ge, Jing. "Tourism Marketing Communications on a Chinese Social Media Platform", In *eProceedings of the ENTER 2014 PhD Workshop - Information and Communication Technologies in Tourism 2014*, 11-19. Accessed March 28, 2017. [http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings\\_ENTER2014\\_PhD-Jan17201411.pdf](http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings_ENTER2014_PhD-Jan17201411.pdf)
- Hadžić, Olga. "Tourism and digitization of cultural heritage", *Pregled NCD* 5(2004), 74-79.
- Januszewska, Małgorzata, Jaremen, D. Elzbieta, and Nawrocka, Elzbieta. "The effects of the use of ICT by tourism enterprises", *Service Management* 2(16), 2015, 65-73. Accessed March 30, 2017. [http://www.wzieu.pl/zn/883/SM-16\\_ZN-883\\_Januszewska\\_etAl.pdf](http://www.wzieu.pl/zn/883/SM-16_ZN-883_Januszewska_etAl.pdf)
- Kayani, Kevin. "Impact of Internet Communication Technology on Bricks & Mortar Travel Agents and Changes in Supply Chain Positioning", In *eProceedings of the ENTER 2014 PhD Workshop - Information and Communication Technologies in Tourism 2014*, 40-56. Accessed March 28, 2017. [http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings\\_ENTER2014\\_PhDWS-Jan17201411.pdf](http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings_ENTER2014_PhDWS-Jan17201411.pdf)
- Mattern, Friedemann., and Floerkemeier, Christian. "Vom Internet der Computer zum Internet der Dinge", *Informatik-Spektrum* 33(2), 2010, 107–121.
- Mihajlović, Iris. "The Impact of Information and Communication Technology (ICT) as a Key Factor of Tourism Development on the Role of Croatian Travel Agencies", *International Journal of Business and Social Science* 3(24) [Special Issue – December 2012], 151-159.
- Mihajlović, Iris. "ICT And New Trends In Consumer Behavior - New Experiential Knowledge, Opportunities or Challenges for Intermediaries", *Journal of Marketing Management*, 2(1), 2014, 43-64.
- Mihajlović, Iris, and Krželj-Čolović, Zorica. "The impact of globalization on the development of tourism within social and economic changes". *European Scientific Journal*, August 2014, Special Edition, 108-120.
- Milenković, Svetislav. *Turizam i ekonomija [Tourism and Economics]*, Ekonomski fakultet Univerziteta u Kragujevcu, Kragujevac, 1999.
- Minazzi, Roberta. *Social Media Marketing in Tourism and Hospitality*, Springer, 2015.
- Neuhofer, Barbara. "The Technology Enhanced Tourist Experience", In *eProceedings of the ENTER 2014 PhD Workshop - Information and Communication Technologies in Tourism 2014*, 90-96. Accessed March 28, 2017. [http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings\\_ENTER2014\\_PhDWS-Jan17201411.pdf](http://www.ifitt.org/wp-content/uploads/2014/05/eProceedings_ENTER2014_PhDWS-Jan17201411.pdf)
- Neuhofer B., Buhalis, Dimitrios., and Ladkin Adele. "A Typology of Technology-Enhanced Tourism Experiences", *International Journal of Tourism Research*, 16 (2014), 340-350. DOI:10.1002/jtr.1958
- Nusair, Khaldoon, Erdem, Mehmet, Okumus, Fevzi, and Bilgihan, Anil. "Users' Attitudes Toward Online Social Networks in Travel" In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 207-224, Farnham: Ashgate Publishing Limited, 2012.
- Obar, A. Jonathan., and Wildman, S. Steven. "Social media definition and the governance challenge: An introduction to the special issue", *Telecommunications Policy*, 39(9), 2015, 745-750.
- Pan, Bing, and Crotts, C. John. "Theoretical Models of Social Media, Marketing Implications, and Future Research Directions" In *Social Media in Travel, Tourism*

- and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 73-86, Farnham: Ashgate Publishing Limited, 2012.
- Parra-López, Eduardo., Gutiérrez-Taño, Desiderio., Díaz-Armas, J. Ricardo., and Bulchand-Gidumal, Jacques. "Travellers 2.0: Motivation, Opportunity and Ability to Use Social Media" In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 171-188, Farnham: Ashgate Publishing Limited, 2012.
- Pease, R. Wayne., and Rowe, Michelle. "An overview of information technology in the tourism industry", 2005. Accessed March 31, 2017. <http://eprints.usq.edu.au/245/1/Pease.pdf>
- Petti, Claudio, and Passiante, Giuseppina. "Getting the Benefits of ICTs in Tourism Destinations: Models, Strategies and Tools", *Int. Arab J. e-Technol.* 1(1), 2009, 46-57.
- Shanker, Deepthi. "ICT and Tourism: Challenges and Opportunities", In *Conference Proceedings on Tourism in India- Challenges Ahead*, 2008. Accessed March 25, 2017. [http://www.academia.edu/7261439/ICT\\_and\\_Tourism\\_Challenges\\_and\\_Opportunities](http://www.academia.edu/7261439/ICT_and_Tourism_Challenges_and_Opportunities)
- Spencer J. Andrew., Buhalis, Dimitrios., and Moital, Miguel. "A hierarchical model of technology adoption for small owner-managed travel firms: An organizational decision-making and leadership perspective", *Tourism Management* 33 (2012), 1195-1208.
- Šimičević, Dario., and Nicić, Miloš. "Savremeni trendovi u promociji hotela putem interneta" [Modern trends in hotel promotion via Internet], *Proceedings of VII Scientific Symposium Hotelska kuća 2008 – Prilagodavanje Srbije i zemalja regiona očekivanim trendovima u hotelijerstvu Evrope i sveta, Zlatibor, Serbia*, 225-235.
- Štetić, Snežana., and Šimičević, Dario. *Menadžment turističke destinacije [Management of tourist destination]*, Visoka turistička škola strukovnih studija, Belgrade, 2014.
- Štetić, Snežana., Šimičević, Dario., and Pavlović, Sanja. "The importance of technologies for a national hotel company development", *Quaestus* 4 (2014), 61-74.
- Yovcheva, Zornitza, Buhalis, Dimitrios, and Gatzidis, Christos. "Smartphone augmented reality applications for tourism", *e-Review of Tourism Research* 10(2), Special ENTER Issue, 2012, 63–66.
- Yoo, Kyung-Hyan., and Gretzel, Ulrike. "Use and Creation of Social Media by Travellers" In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 189-206, Farnham: Ashgate Publishing Limited, 2012.
- Volo, Serena. "Blogs: "Re-inventing" Tourism Communication" In *Social Media in Travel, Tourism and Hospitality - Theory, Practice and Cases*, edited by Marianna Sigala, Evangelos Christou, Ulrike Gretzel, 149-163, Farnham: Ashgate Publishing Limited, 2012.
- Wang, Dan., Xiang, Zheng., and Fesenmaier, R. Daniel. "Adapting to the mobile world: A model of smartphone use", *Annals of Tourism Research* 48(2014), 11–26. Accessed March 30, 2017. <http://dx.doi.org/10.1016/j.annals.2014.04.008>
- Werthner, Hannes, and Klein, Stefan. "ICT and the Changing Landscape of Global Tourism Distribution," *EM – Electronic Markets*, 9(4), 1999, 256-262. [http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics\\_on\\_ICT\\_use\\_in\\_tourism](http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_ICT_use_in_tourism)  
<http://ir.tripadvisor.com/releasedetail.cfm?releaseid=919990>  
[http://www.ifema.es/fitur\\_06/Prensa/Noticiassectoriales/INS\\_047598](http://www.ifema.es/fitur_06/Prensa/Noticiassectoriales/INS_047598)  
<http://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/>

<https://www.tencent.com/en-us/index.html>

<https://www.tourismni.com/globalassets/facts-and-figures/tourism-intelligence/intelligent-vision---tourism-in-the-midst-of-a-mobile-revolution.pdf>

<https://www.treksoft.com/en/blog/travel-tourism-stats-2016>

#### **NOTES ON THE AUTHORS**

**Snežana ŠTETIĆ, PhD, full professor** of College of Tourism in Belgrade, Serbia, was working for the biggest tour operators and travel agencies all around the World. She is in education for Tourism more than 35 years all together. She was Vice Dean at the Tourismology Department at the Faculty of Natural Sciences in Belgrade and Vice Director of College of Tourism. She is President of Tourist Guide Association of Serbia. Her scientific and professional interest includes: Tourism and Hotel management, Management of Tour operators and Travel agencies, Tourist geography and resources in tourism, and current trends on the tourism market. She has published more than 100 papers in scientific journals and conference proceedings. She is the member of editorial board of several scientific journals.

e-mail: snezana.stetic@gmail.com

**Dario ŠIMIČEVIĆ, PhD is a Professor** at the College of Tourism in Belgrade, Serbia. He is lecturing and reseraching about contemporary tourism issues, especially in the field of tourist destination management, marketing in tourism, tourist geography and resources in tourism. He is an author of over 60 papers and 3 books about contemporary tourism and its problems and development. Also, he is a member of Serbian Geographical Society.

e-mail: simicevicd@gmail.com

**Snežana MILIČEVIĆ, PhD, is an Assistant Professor** at the Faculty of Hotel Management and Tourism in Vrnjačka Banja, University of Kragujevac (Serbia). At the Faculty she performs the duties of the Vice Dean for Professional Practice. The sphere of her narrow scientific and professional interest includes tourism management, management of tourism destinations, and current trends on the tourism market. She has published about 60 papers in scientific journals and conference proceedings. She is the editor of the scientific journal *Hotel and Tourism Management* at the Faculty of Hotel Management and Tourism in Vrnjačka Banja.

e-mail: snezana.milicevic@kg.ac.rs