

## THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TRANSFORMATION OF TOURISM BUSINESS AND MARKETS

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### Abstract

For structural reasons, tourism is an information-intensive sector. Tourism services are significantly featured by information, but essentially a physical service is almost always the final product that should be delivered to customers. The uniqueness of a tourism product is reflected in the fact that it is usually obtained as a mixture of products and services provided by different parties and different companies. The complexity of the tourism market and the specifics of a tourism product that contains the information component affect the organization of specific distribution channels for these products and the formation of information and value chains in which each participant adds significant value for the end user of these products. These characteristics of the tourism market and products put information and communication technology (ICT) in the foreground. Given that information and technological support to the tourism sector is very important, travel agencies, major airline companies, tour operators, and large hotel chains intensively use ICT in their business. This article primarily examines the role and impact of ICT on the significant changes that have taken place in the tourism sector and tourism business of companies.

**Кew words:** Information and communication technologies, electronic tourism, Internet, electronic markets, competitive strategy.

## УЛОГА ИНФОРМАЦИОНО-КОМУНИКАЦИОНИХ ТЕХНОЛОГИЈА У ТРАНСФОРМАЦИЈИ ТУРИСТИЧКОГ ПОСЛОВАЊА И ТРЖИШТА

### Сажетак

Из структурних разлога, туризам је информационо интензиван сектор. Туристичким услугама значајно доминирају информације, међутим, суштински производ је скоро увек физичка услуга. Јединственост туристичког производа огледа се у чињеници да се он обично добија као мешавина производа и услуга пружених од различитих страна и више различитих компанија. Сложеност туристичког тржишта и специфичност туристичког производа који у себи садржи

информациону компоненту утичу на организовање специфичних канала дистрибуције ових производа и формирање информационих и вредносних ланаца у које сваки учесник додаје вредност значајну за крајњег потрошача тих производа. Ове карактеристике туристичког тржишта и производа стављају информационо-комуникационе технологије (ИКТ) у први план, зато је информационо-технолошка подршка туристичком сектору веома значајна, тако да туристичке агенције, велике авио-компаније, организатори путовања и велики хотелски ланци интензивно користе ИКТ у свом пословању. Овај рад, пре свега, истражује улогу и утицај ИКТ на значајне промене које су се десиле у сектору туризма и туристичком пословању компанија.

**Кључне речи:** информационо-комуникационе технологије, електронски туризам, интернет, електронска тржишта, конкурентска стратегија ДП.

## *1. INTRODUCTION*

The tourism sector is one of the most important sectors, both for the developed countries and developing countries. This sector has features such as globalization of tourism market, mobility of tourists and abundance of information. Also, all these features characterize an information society. Tourists could be from all nations, social classes, and professions. The tourism sector is diverse, because the size of the companies that make up this sector ranges from micro, medium, to global companies. (Buhalis & Jun, 2011, p. 26)

Social interaction between the seller and buyer is the main component of tourism service and the quality of service is largely determined by this interaction. In the process of making a decision on a trip, only the mental model of the service is available, i.e. its description. Therefore, the moment of making a decision on purchasing a tourism product and the moment of its consumption are temporally and spatially separated. This temporal and spatial difference means that tourists must travel to the destination where consume the service, and therefore, cannot in advance try the tourism service that is embedded in rich locally-colored local context. This temporal and spatial distance can only be overcome by product information that is available in advance and which the consumer can collect. The above feature of a tourism product means that the consumer and the supplier of that product need a wealth of information. This causes high costs of information retrieval and information market imperfections. As a consequence, unique channels of distribution and other value-adding chains with information flows are established. (Buhalis, 2000, p. 232)

The challenge for the tourism sector is how to ensure the integration and adjustment of the physical and information component of services, with adaptable combination of physical and information pieces. ICT is, on the one hand, used for decision-making in tourism firms to assist in the conduct of the business policy, while, on the other hand, is aimed at providing information to potential tourists. Furthermore, tourist agencies use

modern information technology to book travel tickets and hotel accommodation. Internet and web technology support mass “customization” of tourism products, allowing for the configuration of complex and flexible packages of tourism offers, while knowledge management software obtain individualized and personalized marketing approach to potential consumers.

The tourism sector has always led the way in the adoption of ICT applications. Computerized reservation systems and global distribution systems (CRS/GDS) were among the first information systems implemented in the tourism sector of the developed countries. What is more, tourism companies are leaders in the application of the data mining applications for knowledge management and decision support. Marketing information systems in tourism include multimedia applications and virtual reality applications, and the Internet has significantly transformed the creation, distribution, and use of tourism services. These facts indicate that ICT is surely one of the main factors of the tourism sector transformation. This paper attempts to highlight the most important aspects of these changes in the tourism industry: changes in relationships with the consumers of tourism services and changes in the structure of tourism markets that are becoming increasingly electronic. In this context, the second part of this paper analyzes the structure of the tourism market and the role of certain stakeholders on this market, while the third and fourth part discuss the role of information technology, particularly the Internet, in the development and expansion of electronic tourism (e-tourism). The fifth part explains how electronic tourism strongly affects the transformation of the tourist market structure. Finally, in the conclusion, we summarize the role of ICT and e-tourism in the transformation of tourism market and business.

## *2. STRUCTURE OF TOURIST MARKET*

When it comes to tourism companies, their business process output is transferred to the market in the form of product information that is delivered to the potential buyer, i.e. consumer of tourism services. Business operations and decision-making process in tourism firms are also based on market information that is usually presented in the form of statistical surveys, trends, and prediction of market behavior of consumers and actions of competitors. Information flows through the tourism value chain connecting all market participants and reflects the economic and market links between them. Figure 1 presents the information flows among various stakeholders on the tourism market. This figure presents the value chain in terms of information where each participant in the chain adds specific information (or value) that makes it easier for the consumers to make decisions. Figure 1 also represents the structure of the market of tourism services. It distinguishes between entities (market players or participants)

on the supply side and entities on the demand side, as well as intermediaries on both sides. (Werthner & Klein, 1999, p. 256)

On the supply side, there are primary suppliers of tourism services (for example, hotels, restaurants, etc.), which are, in most cases, small and medium-sized enterprises. Primary suppliers include other companies as well, such as organizers of cultural and sports events, which reflect the integrative role of tourism. These companies operate in local-context destinations, either regionally or nationally defined. However, the companies that operate locally are at the same level as big international players (for example, airline and railway companies).

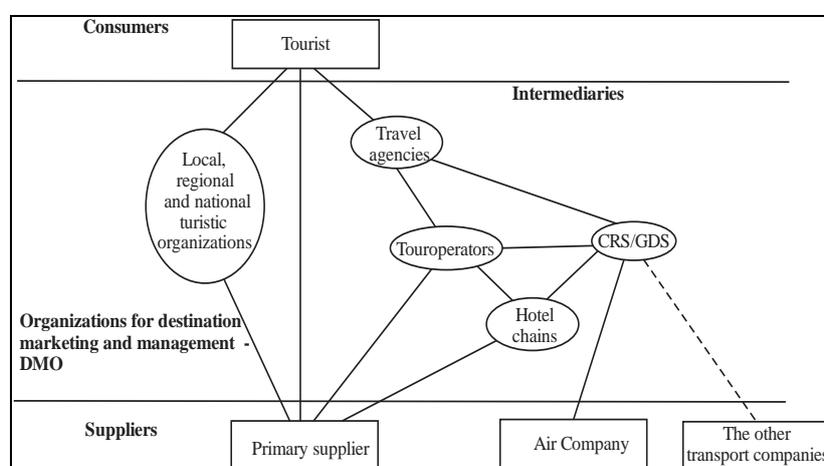


Figure 1. Structure of tourism market

Source: Werthner & Klein, 1999, p. 258

*Tour operators* aggregate or create a new tourism service by mixing basic services or elements of services. Travel agencies should be regarded as information brokers (intermediaries) that provide important information to the consumer and the possibility of booking. Computerized Reservation Systems and Global Distribution Systems (CRS/GDS) cover the offer of airline services and other relevant tourism products (for example, holiday touristic packages and transport by other means of transport). These systems provide the main connection to tour operators' and travel agencies' systems (Миловановић, 2010, p. 170)

Players on the right side of Figure 1 can be seen as an intermediate link between suppliers and consumers. Intermediaries on the left side of Figure 1 are important "for destination management, planning, administration, marketing, and branding of destination. In most cases, these entities have to work on behalf of all suppliers within the destination, but are not included in the booking process" (Werthner & Klein, 1999, p.258). Marketing and management organizations at the destination level are often established by

the state (government) where the destination is located. They can be local, regional, and national tourism organizations.

The improved flow and generation of information reduces the risk on both sides of the tourism supply chain and markets, i.e. for both consumers and suppliers. Except that, the process of aggregation of touristic service is information-intensive. The service must have well-defined interfaces, harmonized in terms of consumer needs, pricing, and distribution channels. This process of packaging or aggregation is quite complicated because the tourism product is variable and diverse, as already explained.

The situation on the market of tourism products is complicated even further because the behavior of consumers is changing, as in other industries. As a result, this market is becoming more segmented, where every potential consumer may belong to various market segments at the same time. An overall trend in today's tourism is that tourists seek a better service and require more specific offer in terms of content and overall arrangement. In addition, tourists are becoming more mobile, but less loyal because they compare many offers and prices. They also practice a higher number of short trips and make decisions on them later, which leads to a shortened time between the booking and consumption (use) of these services. (Buhalis & Law, 2008, p. 615)

The specific characteristics of tourism products, highly competitive market and changes in consumer behavior are the greatest challenges faced by tourism companies. However, ICT supports decision makers in overcoming these challenges. ICT facilitates the almost unlimited spread of tourism information (global computer networks, web and multimedia technologies, etc.), so that customers have easier access to information on tourist services. ICT contributes to global presentation of the destination and global connectivity of market segments. Increasing competition in the distribution of tourism services influences on the transformation of business processes and encourages the innovation, which further requires the improved use of ICT at the management level. (Scavarda, Lustosa & Teixeira, 2001)

### *3. THE ROLE OF ICT IN MODERN TOURISM DEVELOPMENT*

ICT has an important role in the earlier development stages of modern tourism. The first major impact of ICT on the tourism sector was the introduction of the Computerized Reservation System (CRS) in the 1970s. In the 1980s, the Global Distribution System (GDS) emerged, as a logical upgrade to the reservation system, uniting a wide range of services and products and bringing global distribution information structure into the entire tourism sector.

Furthermore, in modern business environment, the role of ICT in tourism business management is growing, so that there are increasing demands for the development of sophisticated information systems in tourism. These high demands are the result of the following factors: global markets and the importance of destination; huge volume of transactions and tourism services adjusted to the specific requirements of consumers; structured, standardized data and multimedia representation; the significance of internal information systems and inter-organizational information systems; various categories of clients (consumers, small and medium enterprises, large enterprises); fragmented and consolidated markets.

In response to the growing requirements of the tourism sector, a powerful information-technology (IT) infrastructure has been built, based on *de facto* Internet protocol standards (TCP/IP, HTTP), browser software tools, and electronic commerce and brokerage services. This IT infrastructure has a layered character: one layer is the shared infrastructure and basic services, while another layer is made of specific services and applications (Wasko, Teigland, Leidner & Sirkka, 2011, p. 649). Therefore IT infrastructure includes shared basic physical layer based on the Internet protocols and general shared services, such as user authentication, encryption of data (cryptography), and calculation. On the other side, specific services and software tools give many additional functions to consumers: general e-commerce procedures (for example, e-payment procedures); specific procedures (for example, search for products and negotiating); services of intermediation and facilitating some user actions (obtaining access to information and software tools, such as reservation information and travel planning tools). From the standpoint of users of tourism information and services, modern Web 2 applications, mobile applications, virtual reality applications and social networks have special significance in the planning and implementation of trips. (Milano, Baggio & Piattelli, 2011)

Compared to other products and services that are delivered over the Internet, travel and tourism services are ranked very high. The reasons for the high position of revenues from tourism and travel realized over the Internet are: full range of general revenues; the importance of wealth and current information for consumers; suppliers of tourist services have global base of the Internet users that could become consumers of these services; high level of competition on the Internet between the old and new tourism market subjects. This competition brings to the creation and proliferation of tourism websites that provide huge tourism information in multimedia form and transactional services.

Researches (Petropoulos, Patelis, Metaxiotis, Nikolopoulos & Assimakopoulos, 2003; Shanks, Jagielska & Malini, 2009; Zhenhui, Chan, Tan & Chua Wei Siong 2010) have shown that the use of information and communication technology in tourism is mostly represented in the part of electronic business involving direct contact with end users. This practically

means that information technology is mostly used in electronic marketing and online sales. Direct contact with the end users of tourism services via the Internet and other channels makes it possible to collect information about customers more efficiently, in order to form a complete profile of each customer. On this basis, the customer relationship management (CRM) and “one-on-one” marketing applications can be developed. Most of these activities take place at the stage prior to the trip, i.e. before the realization of certain services and this part of the market is already well-developed. However, in the next phase of the trip, i.e. tourist’s holiday stay at the destination, ICT is not yet fully exploited. Like other newly opened markets, this provides many business opportunities that often carry the risk, but also good chances for success. The latest advancement in the field of wireless (mobile) technology has brought new services into the tourism sector: mobile electronic services based on the location of tourists. (El-Seoud & El-Sofany, 2010)

Therefore, the intensive use of ICT in the tourism sector, especially with the massive expansion of the internet services, has influenced the development of a new concept of tourism business that can be called e-tourism. This concept is characterized by the use of ICT in the planning of trips (information gathering) and booking places, presentation of tourism information, offering online booking services and other transactional services (for example, e-payment), as well as analysis of information on tourists’ preferences.

#### *4. THE ROLE OF THE INTERNET IN THE DEVELOPMENT OF IT INFRASTRUCTURE OF E-TOURISM*

At the beginning of the global spread of the Internet in the 1990s, CRS and GDS became less important, but, for many years, they provided tourism companies with a competitive advantage in the transfer of information within the tourism sector. Today, more and more tourism services are based on the use of the Internet as the main communication channel, which allows a simultaneous decrease in operating costs and increase in the number of clients. In practice, this means that tourists have the possibility of direct communication with end providers of tourism services and the ability to identify and meet the demands for tourism products. On the other hand, service providers can meet the increasingly complex requirements of their users more efficiently, by offering a wide range of tourism services. Another important application of the Internet in the tourism sector, which helps in creating a complete image of the electronic tourism, is online supply, which is primarily related to the Internet purchase of goods or provision of services to the participants in the supply chain.

In last decade, the volume of information on travel and tourism has increased, due to the Internet and tourism websites. The Internet and

tourism websites give a lot of information for planning trips and holidays on the most important tourist markets and become primary source of information for tourists. This has led to many internet users and potential tourists' confusion with the abundance of information, making them unable to reach a decision. Many tourism firms have launched their websites, but comparing services offered by several different tourism companies is a complicated task. In addition, the responsibility for the website and its contents is not always clear. To overcome this, travel companies have launched their own web portals, where travel providers in the region are presented as in tourism brochures. Accordingly, for tourism companies it is crucial to create a distribution channel of their online products, to be done through the internet portal. High-quality Internet portals of tourism organizations have extensive databases of destinations, products, and services offered. Destinations with a high-quality, integrated, and comprehensive portal have significant benefits and advantages, compared to the destinations that have a number of private portals, none of which are really complete. (Sambhanthan & Good 2013)

The functions of these comprehensive, integrated tourism Web portals are categorized according to different user groups, so that the portal components are designed to meet the needs of these groups. These components, directed towards a centralized database, are as follows: *public internet*, *extranet*, and *intranet* (Figure 2). Integrated tourism web portals with the said components are, in fact, the IT infrastructure of individual tourism destinations, and even entire touristic interesting regions. (Pröll, Retschitzegger & Wagner, 1998, p.1015)

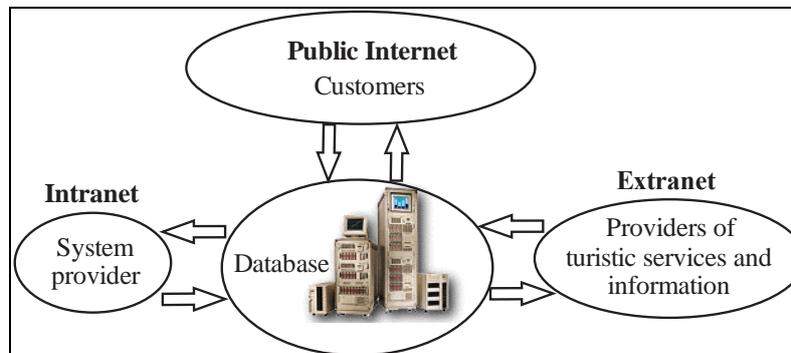


Figure 2. Functional components of integrated tourism web portals  
 Source: Pröll, Retschitzegger & Wagner, 1998, p. 1015

**Centralized database.** The central component of integrated tourism web portals is a database that should be considered together with a shared scheme, necessary for consistent tourism information management. This scheme should contain a large number of tables (files) with information about

various tourism facilities at the destination, reservations, authorizations for system access and configuration of system.

**Public internet.** Public internet, as a component of integrated tourism web portals, contains functions that can be accessed by all tourists around the world. This component contains four modules: 1. Module that obtains actual and dynamic information (for example, information on water temperature and weather forecasts); 2. Module in the form of tourism magazine with articles on exceptional or special events in a particular region, 3. Module that allows quick and easy access to tourism information and services throughout the whole world, continent, country, region, town, or village; 4. Module allowing the search of the high volume of tourism information and booking of tourism services through the Internet infrastructure. (Steinfeld, Markus, & Rolf, 2011, p. 86)

**Extranet.** The effectiveness of an integrated tourism web portal depends mostly on the quality of its content, which refers to accuracy and timeliness. To meet this very important requirement, this web portal enables decentralized maintenance of information via the extranet. Every tourism information provider, regardless of whether it is a small tourism firm or a large tourism company, is able to update and spread its information and services online, 24 hours a day and 7 days a week. (Ráthonyi, 2013)

**Intranet.** This integrated tourism web portal component is intended only for software companies that develop this system (system provider). In this way, the entire system with its components (public internet, extranet, and intranet) can be adjusted in different ways. First, there are the extranet templates created by web tools that could be modified and adjusted to specific requirements. Second, it is possible to manage different extranet and intranet authorizations (authorized system access), as well as current users of the system.

##### *5. IMPACT OF ICT ON THE STRUCTURE OF TOURISM MARKET*

Tourism companies from all tourism sector segments undertake online marketing strategies for entry into this dense and competitive market. Figure 2 shows that ICT can provide access to the tourists as customers (Internet), as well as improved internal information flow and cooperation within the tourism supply chain (Extranet). Internet applications are becoming an electronic link between tourism firms and clients, where services are defined from the perspective of suppliers and consumers of tourism services. Internet use in tourism causes elimination and introduction of new intermediaries at the same time. New suppliers of the Internet services that fully implement the concept of e-tourism appear there. (Yoo, Choudhary & Tridas 2011, p.158)

In addition, the internationalization of tourists in all European countries has had an impact on e-tourism. The business model based on

diverse nationalities of tourists, realized via the Internet, has been adopted in most European countries, because it decreases the dependence on unstable domestic markets. The majority of European tourism destinations aspire towards increasing tourists' diversity, in terms of countries from which they come, not only because of the increased workload, but also because of the decreasing dependence on the specific economic situation on the local markets.

As already noted, the tourism sector has, under the influence of ICT, significantly transformed towards the development of e-tourism and the emergence of new electronic markets. This transformation is reflected in: 1. Elimination and bypassing of intermediaries, such as travel and tourism agencies; 2. Emergence of new intermediaries, such as online booking servers; 3. Emergence of specialized information intermediaries, such as online client agents, and 4. New role of destinations. (Porter, 1985, p. 173; Werthner & Klein, 1999, p. 259)

**1. Elimination and bypassing of intermediaries** (disintermediation). Travel agencies and tour operators have always played a significant role in tourism. The intense application of information technology in the tourism sector has changed this situation. What happened was that their size and importance in the real world became irrelevant for the Internet business, where business model is based on a direct contact with customers. To cope with this challenge, more and more travel agencies expand their business forms, by creating their own web portals or participating in other portals and again becoming intermediaries between end service providers and tourists. In addition, major airline companies are under increased competition and price pressure and they have developed Web sites in order to conduct their own marketing strategies. Some airline companies are careful and do not eliminate their established distribution partners (travel and tourist agencies), while others aggressively pursue this direct sales channel, regardless of the classical distribution channels, and thus become powerful players on the electronic tourism markets.

**2. Emergence of new intermediaries** (reintermediation). The emergence of the so-called on-line booking servers is more significant and has a powerful influence on travel and tourist agencies. These servers play the role of a virtual travel agent that provides reservation of airfare, hotel accommodation, car rental, and holiday trips, and many information services as well. Within the value chain, the servers are considered as new intermediaries that cause avoidance of travel agencies by tourists (customers).

*Booking* servers are established by traditional tourism firms (for example, Sabre with Travelocity), as well as new market players (for example, Microsoft with Expedia). The full scope and potential of tourism market and low entry barriers to the market attracts new market players outside the classical tourism sector (these are, in particular, media firms and

IT enterprises, such as Bertelsmann or Microsoft). This *booking* server development strategy, however, requires constant and large investment, because big competition implies continual innovation in IT products, tourism services, and business models.

**3. Emergence of specialized information intermediaries (infomediaries).** In addition to the above-mentioned business models (emergence of booking servers as virtual travel agents), there are new business models based on the Internet and new e-tourism segments that combine flexible pricing and advising customers. Companies that implement these models can be called online client agents. For example, Priceline (<http://www.priceline.com>) allows for inverse auctions where potential tourists present their travel plans, and a travel agent makes an offer that meets these plans.

Information intermediaries strategically position their applications to support tourists and providers of tourist services, which cannot be realized through the direct sales model. The roles of these intermediaries are to “decrease coordination and communication costs for buyers and sellers, generate volume for suppliers, collect homogeneous demand to provide customers with the opportunity to use suppliers’ volume-based discount, increase the likelihood of fulfilling customers’ orders, and separate or even isolate coordinating mechanism from other sales and distribution channels” (Werthner & Klein, 1999, p. 260).

## 6. CONCLUSION

The speed of new technological and market changes and trends in the tourism sector are certainly the primary challenges for all companies and organizations involved in the tourism business. The development of e-tourism information systems based on modern IT (web and mobile technology, social networks, data mining, and CRM applications) may be an appropriate response to these changes and trends. These IT applications meet the requirements of not only tourists, but also tourism companies and other providers of services and information, which can increase the share in revenues realized online on electronic tourism markets.

In this regard, the benefits of electronic tourism need to be promoted, with the involvement of all tourism market participants. As seen, the competition is intense in the electronic tourism sector, with a large number of online intermediaries and providers of technological solutions struggling to distribute their content. Tourists are increasingly demanding sophisticated online information that incorporates rich media content, all of which helps in choosing the destination. At the same time, web and mobile applications are continuously developing and improving, enabling tourism businesses and organizations to adapt their websites to specific needs of clients. A special role is given to data mining and CRM applications that

are used in the analysis of the data on tourists' preferences and the offer of personalized services tailored to the specific needs of each individual client.

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### **Резиме**

Сектор туризма је увек предњачио у примени савремених ИКТ апликација. Туристичке фирме су лидери у примени апликација за управљање знањем и подршку одлучивању, мултимедија апликација и апликација виртуелне реалности. С друге стране, интернет технологије су значајно промениле производњу, дистрибуцију и потрошњу туристичких производа. Ове чињенице показују да су ИКТ најјачи фактор промена у туристичком сектору. Туристички сектор је под утицајем ИКТ значајно трансформисан у правцу развоја е-туризма и појаве нових електронских тржишта. Ова трансформација се огледа у: елиминисању и заобилажењу посредника, као што су путничке и туристичке агенције; појави нових посредника, као што су онлајн booking сервери; појави специјализованих информациононих посредника, као што су онлајн агенти клијената и новој улози дестинација. Према томе, промене у домену информациононих и комуникациононих технологија, су једне од најзначајнијих које могу да измене правила конкуренције, што је посебно важно за индустрије где је информација један од кључних производа, као што је туризам. Интернет мења правила конкуренције у сектору туризма на два основна начина: смањењем информационе асиметрије и избегавањем посредника, као и стварањем нових облика посредовања. Способност компаније да креира или додаје вредности уз подршку интернет технологије је кључни фактор за конкурентску предност на е-тржиштима у туризму, а то се постиже помоћу диференцијације производа, дискриминације ценама и дистрибуције производа. Овај рад је приказао најважније аспекте промена у туризму које се дешавају под утицајем ИКТ: промене у односима са потрошачима туристичких услуга и промене у структури туристичких тржишта која све више постају електронска. У том контексту, анализирана је структура туристичког тржишта и улоге појединих актера на том тржишту, као и улога информациононих технологија, а посебно интернета у развоју електронског туризма. Систем електронског туризма који подржава мултиканалну дистрибуцију туристичких информација и услуга снажно утиче на трансформацију структуре туристичког тржишта и омогућава туристичким компанијама да развију и имплементирају конкурентску стратегију наступа на е-тржиштима и да остваре предност у односу на ривале.