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**THE IMPACT OF GLOBAL DISTRIBUTION  
SYSTEMS ON TRAVEL AGENCIES' BUSINESS  
EFFICIENCY<sup>20</sup>**

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**ABSTRACT**

Development of modern information and communication technologies gave rise to the emergence of electronic distribution channels, which broadens the effective reach of markets. The same trend influenced tourism industry: travel agencies and other participants in tourism markets are increasingly using modern information and communication technologies in their business. The effects of application of personal computers, the Internet, and the global distribution systems are numerous, ranging from broadening of market and more efficient placement of travel arrangements, to increased business efficiency and lower costs. The paper presents a review of development of global distribution systems and their application in travel agencies' business. In addition, the paper presents the results of a research — conducted among travel agencies in Serbia — on impact of global distribution systems on placement of travel arrangements in travel agencies in Serbia.

*Keywords:* information and communication technologies (ICTs), electronic distribution channels, travel agencies, global distribution systems (GDSs).

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<sup>20</sup> Original scientific article

## **THE IMPACT OF GLOBAL DISTRIBUTION SYSTEMS ON TRAVEL AGENCIES' BUSINESS EFFICIENCY**

The functioning of a modern society, modern economy, modern market and even that of a modern individual cannot be imagined without the use of modern ICT. The usage of information and communications technology in the society of today is not just a matter of prestige but it actually has long term consequences on all aspects of human activity. Modern business entities, especially those in the field of tourism and hospitality (tourism organizations and travel agencies) cannot function properly without ICT.

Intermediation in tourism is an activity which greatly relies on possession of information; therefore, any advancement in ICT has an enormous influence on operation of travel agencies. In all industries including tourism, online sales is becoming increasingly important. Whether a travel agency will "survive" or not will depend on their adaptation (the quicker the better) to new changes and their capability to quickly manage new technology.

In the conducted research which results will be presented in what follows, we started from a hypothesis that the support of global distribution systems to travel agencies has a positive effect on the selling of their tourist products.

## **THE APPLICATION OF NEW INFORMATION AND COMMUNICATIONS TECHNOLOGY IN TOURISM**

The basic characteristic of new information and communications technology is that the full effects of its application can be neither achieved through implementation of just some components (for example computers), nor can the operations of only some business entities in tourism be computerized. Important changes in tourism came to be with the introduction of a single system of information and communication which was acknowledged by all providers of tourist services (hotels, airlines, tour operators, travel and rent-a-car agencies, cruising companies and other providers). The changes were so important that all business entities operating on the tourism market had to start using ICT in order to continue doing business and in order to enhance their competitive position (Poon, 1993, pp. 11-12).

Internet services have enabled the creation of a global market. The advantages of using internet in tourism and hospitality are numerous:

- reduction of costs;
- a greater market;
- a more intense marketing;

- a possibility of constant interactive communication with potential clients and partners, etc.

These examples are just some of the advantages of such a business organization (Unković & Sekulović, 2010).

These processes have especially been intensified with de-regulation of air traffic. New competitive relations between air companies led to an increasing need to use far more information in business. This went hand in hand with constant changes that were the result of appearance of new airlines, new lines, frequent changes in tariffs, simulative policy of special tariffs and so on.

The biggest change of all happened in the area of distribution of tourist services. The cause for such change was a wide application of central reservation systems and internet. Tourism market is slowly developing into an electronic market where distribution and marketing are performed via electronic media.

With this type of business, reservation time is reduced and the reduction in costs is quite considerable. The best example to support this claim is the biggest and most developed hotel information system of a chain of hotels, Holiday Inn. Global distribution system of this company connects more than twenty CRS systems with over 2000 hotels and approximately half a million rooms in 60 countries. On an annual level this global distribution system processes more than 30 million reservations (Svorcan & Stanojević, 2003).

Internet has given birth to an effective and simple system of market communication which was yet an additional stimulus for a global business orientation of leading tour operators, with a simultaneous development of a far more effective system of direct communications with customers (Spasić, 2007).

Electronic channels of distribution represent a great challenge and a threat as they lead to an attenuation of traditional intermediaries on the tourism market. The future will certainly bring about an expansion of new “electronic intermediaries” (Spasić, 2005).

Internet sales on the tourism market of Europe is in constant expansion. According to recent research, the value of online sales of tourism services has went from 0.2 billion euros in 1998. to over 50 billion euros in 2007. (this being 20% of total value of tourism services sale in Europe in 2007). Records for the same year show that the sales of tour packages is 14,5% (Marcussen, 2008).

Use of ICT resulted in a significant improvement in internal organization of travel agencies. With the integration of their *back-office* (for example. accounting, monitoring of fees, personnel) and *front-office* functions (client history, routes preparation, ticketing and communication with providers)

travel agencies have achieved significant synergy, efficiency and reduction of costs. Since the transactions which were performed in branch offices can be automatically forwarded to a head office this automatically means a better financial control (Bethapudi, 2013).

### **THE NOTION, ORIGIN AND DEVELOPMENT OF GLOBAL DISTRIBUTION SYSTEMS**

Global distribution system (GDS) is an information-communications system used for selling of services in tourism. On one hand, it connects providers of services in tourism and sellers of those services, i.e. travel agencies on the other hand. These systems tend to be neutral as their reviews of information are absolutely according to specifically determined criteria. They are global as they create global presence on both sides (supply and demand). Global distribution systems are run by companies which, using computerized systems, offer information from all segments of tourism, enabling reservation and selling of requested services.

Thanks to a rather developed communication network and the internet, global distribution systems connect providers of services with consumers. Within these global distribution systems supply side involves all providers of services in tourism: air traffic, hotels, rent-a-car companies, railways, cultural and sports manifestations and similar. These systems have become some kind of electronic supermarkets for tourism services.

After the Second World War, an American air company, American Airlines, developed the first automatic reservations system called Reservisor. The system proved to be rather successful and it was soon used in the world's biggest chain of hotels Sheraton.

Global distribution systems were created, starting from the 60's, by airlines in order to monitor flights, schedules, availability and prices. Despite current accusations that they are using and are based on old technology, GDSs are actually among the first "electronic" commercial companies in the world. These are the first systems that enabled B2B commerce in the mid 70's when SABRE installed its internal reservation systems in travel agencies. Before global distribution systems, travel agents spent a lot of time entering reservations manually. Airlines realized that automatization of business operations related to reservations enhances the productivity of agents.

So, the application of information-communications technology in tourism started in air traffic. The majority of airliners have automatized their operations in the area of reservations, ticketing, passenger boarding, giving

information on flight schedule, prices etc. GDS in air traffic most often provides the following information: timetables, availability of seats, reservation of a preferred seat, cost of flights, automatic ticketing and issuing of other documentation, paying of services with credit cards, automatic calculation of issued documents and dealing with special travelers' requests. The experience of airlines led to introduction of global distribution systems in the business operations of other tourism entities.

Some of the most important global distribution systems are Amadeus, Sabre, Apollo/Galileo, Travelport, WorldSpan ...

## RESEARCH AND RESULTS

Travel agencies in Serbia mostly rely on the usage of global distribution systems' applications. Amadeus is mostly used in Serbia, but Galileo is becoming increasingly popular so that it has great chances of "spreading" in the market. However, have in mind that small travel agencies were forced to use big computerized reservation systems of airlines due to a lack of knowledge, financial and staff resources to develop such systems on their own. With this, in a way, they lose their individuality and independence on the market.

During 2016. a research on the influence of global distribution systems on the sales of tourism products has been conducted among travel agencies in Serbia. 118 travel agencies from Serbia participated in the research. These were grouped according to different criteria:

- the size of a travel agency (small, medium, large);
- the character of a travel agency (local, regional, national, international);
- business operations area of a travel agency (organization of services in tourism, intermediaries in provision of services in tourism, organization and intermediation in provision of services in tourism);
- number of offices of a travel agency (one, from 2 to 5, more than 5);
- total number of employees ( 1 to 5, 6 to 20, 21 to 50, over 50);
- services a travel agency provides.

General data on the sample are presented in detail in appendix A at the end of this paper.

As stated at the beginning of this paper, we will test a hypothesis which refers to an assumption that a support of global distribution systems to travel agencies has a positive effect on the sales of tourism products. To test this hypothesis we will use a question we asked the travel agencies which participated in the research to respond. The question (statement) is the following: „ *Support of global distribution systems to travel agencies has a*

*positive effect on the sales of tourism products*“. The respondents were offered five answers (principle used is that of Likert scale): „strongly disagree“, „disagree“, „neither agree nor disagree“, „agree “and „strongly agree“.

118 travel agencies that participated in the research answered the following way:

- strongly disagree: 4 agencies (3,4%)
- disagree: 5 agencies (4,2%)
- neither agree nor disagree: 24 agencies (20,3%)
- agree: 31 agencies (26,3%)
- strongly agree: 54 agencies (45,8%).

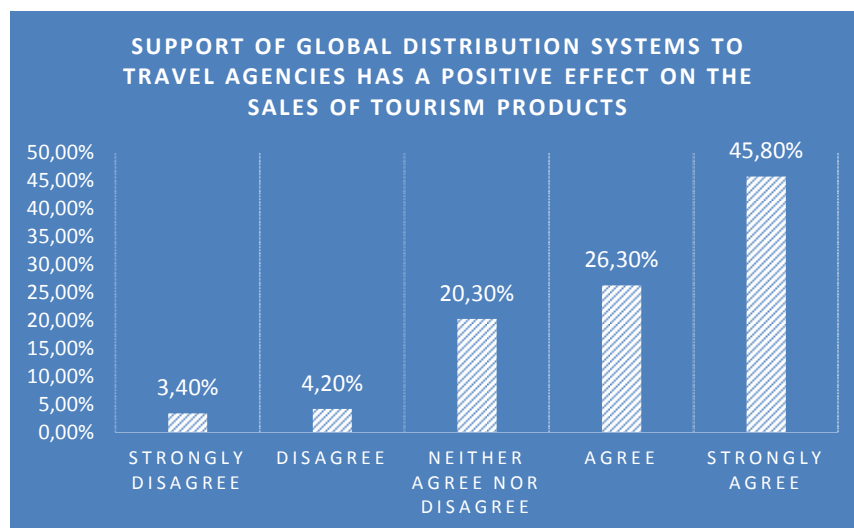
*Statistics*

*Support of global distribution systems to travel agencies has a positive effect on the sales of tourism products.*

N	Valid	118
	Missing	0
Mean		4,07
Median		4,00
Mode		5
Std. Deviation		1,068
Variance		1,141

*Support of global distribution systems to travel agencies has a positive effect on the sales of tourism products*

	Frequency	Percent	Valid Percent	Cumulative Percent
strongly disagree	4	3,4	3,4	3,4
disagree	5	4,2	4,2	7,6
neither agree nor disagree	24	20,3	20,3	28,0
agree	31	26,3	26,3	54,2
strongly agree	54	45,8	45,8	100,0
Total	118	100,0	100,0	



We move to the testing of the hypothesis. The hypothesis will be tested in the following way: if we start from the assumption that travel agencies in Serbia do not have a clear stand on the impact of global distribution systems' support on the selling of their products, we would expect that the number of their answers in each of the existing five categories to be equal.

Since the sample is consisted of 118 agencies, the expected frequencies for each of the five offered answers would be  $118 : 5 = 23,6$ . With the help of  $\chi^2$  – test we shall check if the observed frequencies deviate from the expected frequencies.

Our null hypothesis ( $H_0$ ) is, therefore, that there is no difference between answers that the travel agencies from Serbia gave and accidentally categorized answers.

The following tables contain the representation of results of testing conducted in the IBM SPSS program.

The first table shows observed N and expected N and deviations from the observed and expected frequencies (Residual).

*Support of global distribution systems to travel agencies has a positive effect on the sales of tourism products*

	Observed N	Expected N	Residual
strongly disagree	4	23,6	-19,6
disagree	5	23,6	-18,6
neither agree nor disagree	24	23,6	,4
agree	31	23,6	7,4
strongly agree	54	23,6	30,4
Total	118		

The following table contains data of  $\chi^2$  – test. The value of test (Chi-Square) is 72,424, where it is necessary to mention that 0 cells have expected frequencies less than 5, which is important for the reliability of results of  $\chi^2$  – test. Df – degrees of freedom is 4, and Asymp. Sig. is 0,000.

*Test Statistics*

	<i>Support of global distribution systems to travel agencies has a positive effect on the sales of tourism products</i>
Chi-Square	72,424 <sup>a</sup>
df	4
Asymp. Sig.	,000

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 23,6.

*This high value of  $\chi^2$  – test shows that the results of the survey (observed frequencies) significantly statistically differ from expected frequencies. Based on the results of  $\chi^2$  –test and observed deviations from expected frequencies we reject the null hypothesis ( $H_0$ ) and accept an alternative hypothesis ( $H_1$ ), since there are clear statistical evidence (Asymp. Sig 0,000) that travel agencies in Serbia believe that the support of global distribution systems to travel agencies has a positive effect on the sale of their products.*

**CONCLUSIONS AND FUTURE STUDY**

Modern information – communications technology has enabled the development of international infrastructure of public computer networks. The later development of internet and its commercialization lead to an appearance of electronic distribution channels which are complementary



with traditional distribution channels and spread the effective market span. These new channels of distribution are becoming more and more interesting to a great number of organizations and institutions from different areas. This is the beginning of a process of a wider adoption and application of e-business and development of digital economy.

These kind of tendencies are also characteristic for tourism. Operation of travel agencies is an information-intense work. Therefore, every advancement of technology used for processing and transfer of data and information has a strong influence on travel agencies' business. Travel agencies and other tourism business entities are using more and more of modern information-communications technology. The effects of the use of personal computers and internet, electronic reservation systems, online reservation systems and reviews, global distribution systems and in general, e-business in the operation of travel agencies are multiple: bigger market, enhancement of placing of tour packages, increased business efficiency, reduction of costs, etc.

One of the areas which was under great influence of a sudden development of information-communications technology were reservation and distribution systems in tourism. The systems that some airlines developed with the aim of automatizing the process of reservations and ticketing have now turned into global distribution systems (these systems today being used by travel agencies all around the world). Global distribution systems such as Amadeus, Appolo/Galileo, WorldSpan, Travelport and Sabre dominate the global reservation and ticketing air traffic market. What is even more important is that they are increasingly being used with other forms of transport and even in the reservation of accommodation sector.

Research conducted during 2016. on a sample consisting from 118 travel agencies in Serbia showed that there are strong statistical data (Asymp. Sig 0,000) that travel agencies in Serbia believe that the support of global distribution systems to travel agencies has a positive effect on the sale of their products.

Further research would quantify the real contribution of global distribution systems in the increase of business efficiency of travel agencies, either through the increase of business profitability or through reduction of costs. This could be achieved through a research which would focus on travel agencies' financial data (for example investment in computer equipment, software and employee training; total costs, profit and similar).

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## APPENDIX A

Sample – general data

118 travel agencies of different size from Serbia participated in the research. The greatest number of travel agencies were small agencies (57,6%), followed by medium-scale agencies (32,2%) and large-scale agencies (10,2%).

*Statistics*

*The size of a travel agency*

N	Valid	118
	Missing	0
Mean		1.53
Median		1.00
Mode		1
Std. Deviation		.676
Variance		.457

*The size of a travel agency*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	68	57.6	57.6	57.6
	Medium sized	38	32.2	32.2	89.8
	Big	12	10.2	10.2	100.0
	Total	118	100.0	100.0	

*Character of a travel agency*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Local	38	32.2	32.2	32.2
	Regional	17	14.4	14.4	46.6
	National	25	21.2	21.2	67.8
	International	38	32.2	32.2	100.0
	Total	118	100.0	100.0	

According to the business operations area of a travel agency, the greatest number of agencies organize and intermediate in provision of services in tourism (71,2%) while a far smaller amount of agencies are only intermediaries (20,3%), i.e. only organize and provide services in tourism (8,5%).

*Statistics*

*Business operations area of a travel agency*

N	Valid	118
	Missing	0
Mean		2.63
Median		3.00
Mode		3
Std. Deviation		.638
Variance		.407

*Business operations area of a travel agency*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	organization of provision of services in tourism	10	8.5	8.5	8.5
	intermediation in provision of services in tourism	24	20.3	20.3	28.8
	organization and intermediation in provision of services in tourism	84	71.2	71.2	100.0
	Total	118	100.0	100.0	

According to the number of offices an agency has, the majority of travel agencies participating in this research have only one office (65,3%); 26,3% of them have from 2 to 5 offices while only 8,5% of agencies have more than five offices.

*Statistics*

*Number of offices*

N	Valid	118
	Missing	0
Mean		1.43
Median		1.00
Mode		1
Std. Deviation		.647
Variance		.418

*Number of offices*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One	77	65.3	65.3
	2 - 5	31	26.3	91.5
	More than 5	10	8.5	100.0
	Total	118	100.0	100.0

According to the **total amount of employees**, most travel agencies in the survey have 1 – 5 employees (66,9%), 19,5% between 6 and 20 and 3,4% agencies have 21 to 50 employees. 10,2% travel agencies have more than 50 employees.

<i>Statistics</i>		
<i>Total number of employees</i>		
N	Valid	118
	Missing	0
Mean		1.57
Median		1.00
Mode		1
Std. Deviation		.965
Variance		.931

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 5	79	66.9	66.9
	6 - 20	23	19.5	86.4
	21 - 50	4	3.4	89.8
	More than 50	12	10.2	100.0
	Total	118	100.0	100.0

84, 7% of travel agencies participating in the research said that they do organize/act as intermediaries when it comes to providing services both in the country and abroad (the question being – Do you organize/act as intermediaries for services only in Serbia, Serbia and abroad or just abroad.) Only 11, 0% of travel agencies offer services just in the country or just abroad (4, 2%).

*Statistics*

*Do you organize/act as intermediaries for services in tourism...*

N	Valid	118
	Missing	0
Mean		1.93
Median		2.00
Mode		2
Std. Deviation		.386
Variance		.149

*Do you organize/act as intermediaries for services in tourism...*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Just in the country	13	11.0	11.0
	Both in the country and abroad	100	84.7	95.8
	Just abroad	5	4.2	100.0
	Total	118	100.0	100.0