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Review Article

OPERATION OF TOURIST BUSINESS ENTERPRISES USING INFORMATION-COMMUNICATION TECHNOLOGY

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***Abstract**: Overcoming crisis periods in business on the tourist market in Serbia is effectively overcome by using modern information and communication technologies. The development and use of these technologies enabled the broader application of electronic distribution channels that enable more comprehensive access to the market. This is particularly significant in the tourism industry due to sudden demographic changes and migration processes of tourists and employees in this propulsive business area. Travel agencies, as well as other entities in the tourist market, operate more and more intensively (even predominantly) using information and communication technologies. The effects of using personal computers, the Internet, global distribution, and reservation systems are multiple. They are manifested in the expansion of the market, the improvement of the placement of tourist products, increased business efficiency, cost reduction, strengthening competiveness, and the potential disintermediation of traditional travel agencies. This paper contains the summary results of research conducted in 2023 among travel agencies in Serbia on the impact of the most modern information and communication technologies on the tourism market in Serbia and its transformation from the perspective of business efficiency and competitiveness.*

***Key words**: modern ICT, tourist market, transitional changes, migrations, transformation, competitiveness.*

***JEL classification:** D12, O12, E20*

1. INTRODUCTION

Modern information and communication technology (ICT) is critical in the functioning of the modern economy, market, individuals, and society. These sophisticated technologies have far-reaching consequences for all spheres of human activity. This means that externally dynamic progress in ICT and digital data processing contributes to shaping all human activities into a specific techno-economic system called the "digital economy." The dynamic development and comprehensive application of the Internet produced new electronic distribution channels, leading to the effective expansion of the tourist market. This especially applies to economic activities such as tourism, which rely mainly on information. ICT significantly impacts the efficient business of travel agencies, where online sales are beginning to dominate. In an increasingly turbulent market, the survival of travel agencies largely depends on quick adaptation to ever-faster changes and mastering increasingly modern technologies. Therefore, the intended research was based on the assumption that applying this technology increases competition in business, and from the aspect of tourism companies, the work focuses on travel agencies. The central topic is the impact and the way ICT application reshapes the tourism market. However, the effects of application cannot be achieved by segmental application. However, essential changes are achieved by introducing and applying an integral information system, leading to acceptable competition in the tourist products and services market. Essential changes in this activity were created by unifying the information and communication system all tourism employees use. Internet services enable access to the global market and enable multiple advantages: (1) cost reduction, (2) market expansion, (3) intensive marketing, (4) the power of constant interactive communication with potential clients, partners, and other market participants;

These are just some opportunities that can be used as advantages in the tourism market. The overall processes, incited by the application of ICT, were

significantly intensified by the deregulation of air traffic because much more information is used, with constant changes, thanks to the appearance of new airlines, the introduction of new routes, frequent changes in tariffs, stimulating policies of special tariffs and the like (Petrović, 2019, p. 34-45). The most significant changes took place in the distribution of tourist services thanks to the widespread use of central reservation systems and intensified Internet use. The modern tourist market is an electronic market where distribution and marketing are carried out using electronic media. The Internet enabled a simple and cheap system of communication with the market, which represented an additional incentive for the global business orientation of leading tour operators while at the same time providing a far more efficient system of direct communication with consumers (Petrović, 2014, p.33). Electronic distribution channels represent a great challenge and threat, considering that they lead to the disappearance of traditional intermediaries in the tourist market (disintermediation), so implementing "electronic intermediaries" is intensifying more and more. The comprehensive application of ICT resulted in a noticeable improvement in the functioning of tourism organizations, both internally and externally. Back-office functions (accounting, monitoring of commissions, personnel) and front-office functions (client history, creating routes, issuing tickets, and communication with suppliers) were integrated so that, in their business, travel agencies reached a high level of synergy, efficiency, and effectiveness, which resulted in a reduction in business costs. Therefore, a more comprehensive business control is achieved by monitoring transactions automatically forwarded to the headquarters (Bethapudi, 2013, p. 67-79). The tendency for numerous clients to independently search for favorable and attractive tourist arrangements is developing, thus changing the agencies' business. On the other hand, many agencies have switched to doing business exclusively via the Internet, occupying a significant place in the tourist market. This type of agency business became dominant during the pandemic (2020-2022), and significant disruptions occurred in the market. However, the Internet began to take precedence even before the general business crisis. For example, a 2018 survey found that over 57% of Americans purchased or booked travel arrangements online, compared to only about 18% in 2000 (Horrigan, 2019, p.43). Research conducted in 2023 showed that 2023 94% of Americans used the Internet to plan and book travel in any form (Chose & Fesenmaier, 2024, p.428). At the beginning of the twenty-first century, there have been significant changes in the distribution of tourist products and consumer services. Over time, the application of ICT technologies has intensified and led to changes in distribution channels. Online access to information and accommodation booking, plane tickets, etc. Consequently, it was reflected in business and the modeling of agencies and tour operators. In addition, new intermediaries emerge on the market, especially under the influence of the Internet as an essential communication and sales channel for tourist products and services. That is why some analysts predicted the disappearance of classic travel agencies and mediation (Rodrigues et al., 2023, p. 20). In addition to reshaping the tourist market, modern ICTs are changing the competitive structure. This is mainly related to the acquisition of that advantage and is affected by the online visibility that only a limited number of companies can have at the top of the search engine results list when searching for tourist content (Smithson et al., 2011, p. 1583), Application of ICT a new service appears, and then suddenly develops online self-service travel. For those interested, this kind of service is made possible by online platforms that offer extensive information about attractive sightseeing locations, accommodations, restaurants, transport connections, shopping, and entertainment. Clients can choose the attributes and the way of travel according to their wishes. The platform will automatically create a route based on the criteria and display appropriate information about the desired trip (Xiaolong et al., 2018). In tourism agencies in Serbia, owners filled out questionnaires from small agencies during the research, while in large ones, managers at the middle and high management levels filled in the questionnaires. The study's primary goal was to determine the impact of applying the most modern ICT on travel agencies' business. The primary hypothesis from which this research started is that the application of modern ICT in the business of travel agencies intensifies competition among them and on the market, and to test this assumption; the agencies were offered a position based on which they ranked on the scale.

2. MATERIALS AND METHODS

In treating new business trends, the possibilities of applying many online self-service travel systems were considered. For example, Plan Tour uses an automatic planning approach to generate a multi-day plan with the most relevant points of interest in a city/region being visited. The system collects information about users and points of interest, groups those points with the help of clustering techniques, and fragments the system - problem into daily subproblems. An automated planner is then used to create high-quality travel plans based

on user ratings on social networks. This means using an intelligent system that crosses generated knowledge with efficient automated techniques (Cenamor et al., 2017, p. 1). During 2023, 239 travel agencies (YUTA) operated on the territory of Serbia. In the Research conducted that year, 120 travel agencies were included. According to the compiled questionnaire, all agencies were divided according to basic features:

- Size of tourist agency (small, medium, large);
- Character of the travel agency (local, regional, national, international;
- The business area of the tourist agency (organization of services in tourism, mediation in the provision of services in tourism, organization and mediation in the provision of services in tourism);
- Number of branches for performing activities (one, from 2 to 5, more than 5);
- Total number of employees (1-5, 6-20, 21-50, over 50);
- Types of services provided by the travel agency and the territory where these services are provided).

The presentation of research results primarily includes answers to questions related to the use of ICT in business:

- Do you apply modern ICT in business?
- How many computers do you have?
- Do any of your employees have computer training certificates?
- Do you have a professional in charge of computer maintenance?
- What is your agency's internet connection speed?
- Do you have your website?
- Do you have a person in your employment who regularly maintains and updates your website?
- Which package do you use for web hosting of your internet presentation?
- Which of the global distribution systems do you use in your agency?

Table 1. Essential characteristics of travel agencies from a sample of 120 (in%)

By size	small	60,6	medium	29,2	large	10,2	
Tourist agency character	local	32,2	regional	32,2	national	21,2	intern.14,4
Number of branches	1	65,2	from 2 - 5	26,3	more than 5	8,5	-
Total number of employees	to 5	66,9	from 6-20	19,5	from 21-50	8,4	over 50 10,2

Source: Author's observation during research in 2023

In the questionnaires, a certain number of positions were offered, which the respondents had to rank according to the principle of the Likert scale (do not agree at all, mostly disagree, neutral, mostly agree, completely agree). The points that were offered to the tourist agencies for ranking are the following statements:

- The application of modern ICT in business contributes to the reduction of business costs;
- The application of ICT to the business of the agency contributes to greater business profitability;
- The offer of arrangements on our website is regularly updated;
- We offer our clients the possibility of online reservation arrangements;
- ICT increases competition in the tourist market;
- Traditional travel agencies that are unable to adapt to the increasingly dynamic market and master the latest technologies will be pushed out of the market;
- Clients will, in the future, satisfy a more significant part of their needs via the Internet;
- The support of global distribution systems to travel agencies has a positive effect on the placement of tourist products;
- The application of modern ICT in the business of travel agencies contributes to greater business efficiency.

All these hypotheses require proof or rejection, and the results of ranking certain attitudes are often used. To confirm the main hypothesis, Pearson's X2 - test was used to prove a direct connection between the answers when ranking different attitudes, contingency tables, Pearson's X2 - test, as well as Spearman's □ (ro) and

Kendall's tB (tau-b) were used—the correlation coefficient.

3. RESEARCH RESULTS

The given sample of travel agencies was first asked to answer questions related to using ICT in business. Then, they were offered a certain number of attitudes, and they ranked according to the principle of the Likert scale. The most important results of the research are presented in 7 paragraphs, and they are as follows:

- More than half of the travel agencies included in the research (52.4%) have intermediaries with a computer training certificate. The percentage of agencies with such employees grows along with the agency's size.
- All surveyed agencies use broadband Internet access, with only 19.1% of surveyed agencies responding that they use slower broadband connections of 1-5 Mbps. While all others (89.9%) use connections faster than 5 Mbps;
- 13.6% of the surveyed agencies answered that they do not have their website;
- They do not use any global distribution system, answered 40% of the surveyed agencies, and of those that are used in the travel agencies in Serbia, the most represented are Amadeus and Galileo/Appolo;
- 44.9% of agencies, or almost 27.1% of agencies from the sample, fully agreed that ICT contributes to the reduction of business costs;
- Half (50%) of the agencies or most (38.1%) of the agencies from the questionnaire fully agreed that ICT contributes to greater business profitability;
- Most of the surveyed agencies believe that the support of global distribution systems in travel agencies has a positive effect on the placement of tourist products.

Table 2. Ranks the offered position
Opinion: ICTs increase competition in the tourist market

Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Mostly disagree	1	8	8	8
Neutral	16	12,9	12,9	12,7
Mostly agree	31	26,3	26,3	39,0
Completely agree	72	61,0	61,0	100,0
Total	120	100,0	100,0	

Source: Results of a survey conducted in a sample of 120 t.a. during the year 2023

The initial hypothesis was tested using data from 120 tourist organizations in Serbia. These organizations were assumed not to have a clearly defined position on the impact of ICT on increasing competition in the tourism market. The respondents' answers were not randomly distributed, with varying numbers of answers in each of the five offered categories. The expected frequencies (for each of the five provided answers) could be 120:5 = 24.0. However, the X2 test was used to check whether the recorded frequencies deviate from the expected frequencies. The null hypothesis (H0) is based on the fact that there is no difference between the answers provided by tourism organizations in Serbia and randomly distributed answers. The test results of this research are presented in the IBM SPSS program. Research indicates, from the aspect of perceived and expected frequencies and possible deviations, because no agency ranked the stated position with the answer "I do not agree at all," the expected frequencies for the remaining four answers are 29.5 for the entire sample.

Table 3. Observed and expected frequencies.
ICT increases competition in the tourism market

Opinion	Observed frequencies	Expected frequencies	Deviation
Mostly disagree	1	29.5	-28,5
Neutral	16	29,5	- 15,5
Mostly agree	31	29,5	1,5
Completely agree	72	29,5	42,5
Total	120		

Source: Research on a sample of 120 agencies during the year 2023.

The value of the X2 test is 96,983, and it should be noted that no cell has an expected frequency lower than 5, which is essential for the reliability of the X2 test results. The results show that the observed frequencies are statistically significantly different from the expected frequencies. According to this result (X2 - test) and the observed deviations observed from the expected frequencies, the null hypothesis (H0) is rejected. The alternative hypothesis (H1) is accepted, considering that there is solid statistical evidence that tourism agencies in Serbia believe that applying modern ICT into their business increases the competition in the tourist market.

Tabel 4. Ranking of the positions offered

Attitude: In the future, the client will have an increasing part of his tourist needs via the Internet				
Opinion	Observed frequencies	Expected frequencies		Deviation
Strongly disagree	1	8	8	8
Mostly disagree	3	2,9	2,5	3,4
Neutral	9	7,6	7,6	11,0
Mostly agree	35	29,7	29,7	40,7
Completely agree	70	59,3	59,3	100,0
Total	120	100,0	100,0	

Source: Authors, survey conducted in 2023

4. DISCUSSION

Undeniably, the research results confirm that tourist agencies in Serbia believe that the application of modern ICT in business increases competition in the market. From that aspect, in order to get a clearer picture of the research results and more precisely determine the reasons for this attitude of travel agencies in Serbia, with the help of contingency tables (cross-tabulation), Pearson's X2 - test, as well as Spearman's ro and Kendall's tB (tau- b) correlation coefficient, the interdependence of the ranking of the previous position with the ranking of other positions carried out by the travel agencies included in the research was also analyzed. For example, one of the opinions offered is that "in the future, clients will satisfy an increasing part of their tourist needs via the Internet." Table no. Three shows how the travel agencies included in the research ranked this attitude.

Using the contingency table and Pearson's X2 test, the data from this position were compared with the agencies' responses when ranking the position used to prove the hypothesis (Table 1). Then, the correlation of the ranking of these positions was examined with the help of Spearman's (ro) and Kendall's (B) correlation coefficients. These results are presented in the following tables.

Table 5. Person's X^2 – test

	Value	Degree of freedom	Significance (two-tailed)
Person's X^2	25.691	12	.012
Odds ratio	21.923	12	.038
Linear-linear association	10.880	1	.001
Number of valid cases	120		

Source: Authors, research results, 2023.

Using the contingency table and Pearson's X2 test, the ranking of the previous position was compared with the agencies' responses when ranking the positions used to prove the hypothesis (table 1). Then, the correlation between the ranking of these positions was examined with the help of Spearman's r (ro) and Kendall's tB (tau-b) correlation coefficient. Based on the results of Pearson's X2 test (25,691) at a significance level of 0.012, it can be concluded that those agencies from the sample who believe that the use of ICT increases competition in the market, also agree that in the future, clients will satisfy an increasing part of their tourism needs via the Internet. The correlation during ranking these attitudes was determined with the help of Spearman's (ro) and Kendall's tB (tau-b) correlation coefficient. These correlation coefficients show a significant positive correlation when ranking the expressed attitudes at the significance level of 0.01, which is two-way. The next position offered was: "Traditional travel agencies that are unable to adapt to an increasingly dynamic environment and to master new technologies will be pushed out of the market."

Table 6. Ranking of the position offered.

Attitude: Traditional TAs are unable to adapt to an increasingly dynamic environment Moreover, to master new technologies, they will be squeezed out of the market.

Opinion	Observed frequencies	Expected frequencies		Deviation
Strongly disagree	6	5,1	5,1	5,1
Mostly disagree	3	2,5	2,5	7,6
Neutral	21	17,8	17,8	25,4
Mostly agree	31	26,3	26,3	51,7
Completely agree	59	50,3	50,3	100,0
Total	120	100,0	100,0	

Source: Authors, research results, 2023.

Looking at the contingency table and Pearson's X2 test, the ranking of this position is compared with the agencies' responses when ranking the position used to prove the initial hypothesis. Based on the results of Pearson's X2 test (61.953) at the significance level of 0.000, it can be concluded that the sample agencies believe that modern ICT use increases competition in the market. They think that classic travel agencies, which cannot adapt to an increasingly dynamic environment and master the most modern technologies, will be pushed out of the market. Correlation analysis points to that conclusion, considering the ranking of the proposed positions. This means that Kendall's tau-b and Spearman's ro correlation coefficients show a significant positive correlation when ranking these attitudes at a significance level of 0.01 in that period.

Table7. Person's X^2 – test

Indicator	Value	Degree of freedom	Significance (two-way)
Person's X^2	61.953	12	.000
Odds ratio	30.178	12	.003
Linear-linear association	10.351	1	.001
Number of valid cases	120		

Source: Authors, research results, 2023.

The following table shows the ranking of attitudes related to the impact of ICT on increasing profitability and reducing the operating costs of travel agencies.

Table 8. Ranking of the positions offered

Position: The application of modern ICT in the operation of agencies contributes to greater profitability				
Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Strongly disagree	1	8	8	8
Mostly disagree	3	2,5	2,5	3,4
Neutral	10	8,5	8,5	11,9
Mostly agree	45	38,1	32,1	50,0
Total	120	100	100	

Source: Authors, research results, 2023.

Looking at the views on the impact of ICT on increasing the profitability of the business (previous table) or on reducing business costs (following table) and the concordance of the ranking of these views with the ranking of the view that was used to prove the hypothesis (table no. 1), results were obtained that do not say enough in contribution to the existence of a statistically significant connection between the answers given by the agencies.

Table 9. Ranking of the positions offered

Position: The application of modern ICT in the operation of agencies contributes to greater profitability				
Opinion	Frequency	Percentage	Valid percentage	Percentage (cumulative)
Completely disagree	2	1,6	1,6	1,6
Mostly disagree	5	4,2	4,2	5,9
Neutral	26	22,0	22,0	28,0
Mostly agree	32	27,1	27,1	55,1
Total	120	100,0	100,0	

Source: Authors, research results, 2023.

Although the non-parametric correlation coefficients showed the existence of a significant positive correlation at a substantial level of 0.01 in the first (Kendall tau-b = 0.246; Spearman ro = 0.272), Pearson's X2 test in both cases did not show a connection between the responses of the agencies, when ranking the mentioned attitudes (table 1, 8 and 9) at a statistically significant level. This means that the agencies (which participated in the research) accept that ICTs influence the level of competitiveness but do not justify their introduction into business with lower business costs or increased profitability. This is because the introduction of ICT in the business of agencies requires significant investments in hardware and software, training employees to work with new technologies, or the hiring of experts, especially for small agencies, up to 5 employees and only one branch, which were the most in the sample (65%). By introducing new technologies, such agencies take a slightly defensive stance because their motive is not to increase profitability or reduce costs, and the fear of competition and disintermediation can justify such an attitude. More specifically, there is a fear among small agencies that agencies that master new ICT faster could, in the long term, gain a competitive advantage over them and push them out of the tourism market, in the long term or entirely.

CONCLUSION

Dynamic movements in the tourist market and the rapid development of ICT technologies influenced the reshaping of the tourist market. The dominance of global distribution systems is on the decline, and the development of the Internet and the World Wide Web have changed distribution channels. The Internet has long been a low-cost channel for direct marketing and has contributed to erasing the differences in the geographic reach of global brands and small or local independent hotel chains and airlines. These "small" ones began to invest more and more in their websites and booking systems and became more independent from global distribution systems and travel intermediaries. Consequently, the tourism market is reshaping: instead of intermediation (global distribution systems), there is disintermediation (branded websites and booking systems). Online platforms, as systems, contain up-to-date information about popular tourist destinations and provide helpful tourist information that is in line with user preferences. The effects of more intensive use of computers and the Internet, electronic reservation systems, online systems for booking accommodation and reviews, global distribution systems, and, in general, electronic business in the work of agencies are multiple and consist of expanding the market, improving the placement of tourist arrangements, increased business efficiency, cost reduction, etc. In Serbia, out of a total of 239 agencies that were active in 2023, the research included 120 of them, which indicated the existence of solid statistical evidence (X2 = 96.983 at the significance level of 0.000) that agencies believe that the application of ICT in business increases competition in the tourism market. In addition, the agencies believe that they will satisfy a more significant part of their needs via the Internet, which is confirmed by Pearson's X2 test (25.691) at a significance level of 0.012 and with the help of Spearman's (p 0 0.88 and Kendall's (tB = 0.310)) coefficient correlation at the =.01 level of significance. Realizing the challenges of ICT, tourist agencies find their chance to offer their services through electronic distribution channels. The application of ICT increases competition, and traditional agencies will be pushed out of the market because they do not use modern ICT, which was confirmed by Pearson's X2 test (61.953) at the significance level of 0.00 and with the help of Spearman's (r = 0.283) and Kendell's (tB =0.310) coefficient at the significance level of the correction coefficient that the application of ICT increases the competition for the overall offer and the attitude that this modern technology in business contributes to greater profitability. A correlation was established at the significance level of 0.01 with the help of Spearman's (r = 0.246) and Kendall's (rB = 0.264) coefficients. However, Person's X2-test did not confirm this correlation at a statistically significant level. A correlation was also established between the attitude that ICT increases

competition and the attitude that its application contributes to reducing business costs. Small tourist organizations, with up to five employees and only one branch office, when monitoring and introducing ICT, do not expect an increase in profitability or a decrease in costs but have a skeptical attitude. Other agencies, from the sample, have a motive for introducing ICT due to the fear of increased competition and disintermediation, that is, the fear that those with more intensive application of ICT could dominate the tourist market for a more extended period.

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