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Editorial

Менаџмент у хотелијерству и туризму – Hotel and Tourism Management is an open access peer-reviewed journal which discusses major trends and developments in a variety of topics related to the hospitality and tourism industry. The Journal publishes both theoretical and applied research papers, giving full support to collaborative research efforts taken jointly by academia and industry. According to its editorial policy goal, *Менаџмент у хотелијерству и туризму – Hotel and Tourism Management* has constantly been striving to increase its quality by promoting the popularisation of science and providing significant scientific and professional contribution to the development of hospitality and tourism industry, both in Serbia and on the global scale. The Journal is published by the Faculty of Hotel Management and Tourism in Vrnjačka Banja, University of Kragujevac. Since launching the Journal in 2013, twenty-four issues have been published so far.

Менаџмент у хотелијерству и туризму – Hotel and Tourism Management includes the following sections: Original Scientific Paper, Review Article, Short or Preliminary Announcement and Scientific Critique. The Journal does not consider PhD theses as prior publication and welcomes excerpts from the author's dissertations. It is published semiannually. The Journal offers an open access of its contents, which makes research results more visible to a wider international academic community. All articles are published in English and undergo a double-blind peer-review process.

The main aspects taken into consideration in paper evaluation are the originality of the study, contribution to the theory and practice and the use of grammar and style (either American or British English are accepted). The expected turn-around period is one to two months following the date of receipt. The crucial requirements for the submission of a manuscript are that the manuscript has not been published before, nor is it under consideration for publication elsewhere. The manuscript will be initially checked to ensure that it meets the scope of the Journal and its formal requirements. Submitted content will be checked for plagiarism. The provided names and email addresses will be used exclusively for the purposes stated by the Journal and will not be made available for any other purpose or to any other party.

The Journal has a reputable international editorial board comprising experts from the United States, the United Kingdom, Australia, the Russian Federation, Sweden, Spain, Italy, the United Arab Emirates, India, Poland, Finland, Argentina, Greece, Slovenia, Bulgaria, Serbia, Croatia, Montenegro.

I am glad to announce that *Менаџмент у хотелијерству и туризму – Hotel and Tourism Management* is indexed in Web of Science (Emerging Sources Citation Index – ESCI), ERIHPLUS (European Reference Index for the Humanities and the Social Sciences), CABELLS Scholarly Analytics, CEEOL (Central and Eastern European Online Library), DOAJ (Directory of Open Access Journals), ProQuest, EBSCO (EBSCO Information Services), Ulrich's Web (Ulrich's Periodicals Directory), CAB Abstract, SCIndeks (Serbian Citation Index), Scilit, CNKI (China National Knowledge Infrastructure), CyberLeninka, WorldCat and Google Scholar databases.

I would like to use this opportunity to express my deep gratitude to the authors, reviewers, and members of the Editorial Board for their devoted time and efforts that have contributed to the development of our Journal. At the end, I am pleased to invite you to look into the latest research in the fields of hospitality and tourism presented in the current issue.

Editor in Chief
prof. Drago Cvijanović

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Impact of tourism on economic growth and CO_2 emissions in the EU: A dynamic panel threshold analysis

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Abstract

Purpose – The development of tourism provides significant support for economic growth, and also generates environmental effects that are generally not positive. Accordingly, this paper aims to explore the dynamic effects of tourism development in 27 European Union countries on economic growth and carbon dioxide (CO_2) emissions. The objective is to empirically examine the correctness of the tourism-led growth hypothesis (TLGH) and the Environmental Kuznets Curve (EKC). **Methodology** – The study applies a dynamic panel threshold regression to investigate whether the effects of tourism on economic growth and CO_2 emissions change after reaching a certain level of development (threshold). **Findings** – The research results support the validity of both the TLGH and EKC hypotheses. An increase in tourism development (measured by international tourists' receipts) stimulates economic growth. Additionally, tourism contributes to a lower marginal increase in CO_2 emissions if international tourists' receipts per capita exceed the threshold of $1,768 or if a country's GDP per capita surpasses $17,570. **Implications** – This paper contributes to the theoretical literature of the nexus between tourism, economic growth, and environmental effects by applying an advanced econometric methodology. Empirical research findings show that after reaching a specific development threshold, tourism fosters economic growth while reducing negative environmental impacts.

Keywords: tourism development, economic growth, CO_2 emissions, dynamic panel threshold regression, Environmental Kuznets Curve
JEL classification: Z32, O44, Q56, C23

Uticaj turizma na ekonomski rast i emisiju CO_2 u EU: Dinamička panel analiza sa pragom

Sažetak

Svrha – Razvoj turizma predstavlja značajnu podršku ekonomskom rastu, ali proizvodi i ekološke efekte koji, po pravilu, nisu pozitivni. Shodno tome, svrha ovog rada je da istraži dinamičke efekte razvijenosti turizma u 27 zemalja Evropske unije na ekonomski rast i emisiju ugljen dioksida (CO_2). Cilj je da se empirijski ispitaju hipoteza o rastu vođenom turizmom (HRVT) i validnost Ekološke Kuznetsove krive (EKK). **Metodologija** – U radu se

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primenjuje dinamička panel regresija sa pragom kako bi se utvrdilo da li se uticaj turizma na privredni rast i emisiju CO_2 menja nakon dostizanja određenog nivoa razvijenosti (praga). **Rezultati** – Rezultati istraživanja potvrđuju validnost HRVT i EKK hipoteza. Povećanje razvijenosti turizma (mereno vrednošću prihoda od stranih turista) podstiče privredni rast. Turizam doprinosti manjoj dodatnoj emisiji CO_2 ukoliko prihod od stranih turista po glavi stanovnika premaši prag od 1.768 USD, odnosno, ukoliko GDP per capita zemlje premaši 17.570 USD. **Implikacije** – Ovaj rad doprinosi teorijskoj analizi odnosa turizma, ekonomskog rasta i ekoloških efekata primenjujući naprednu ekonometrijsku metodologiju. Nalazi empirijskog istraživanja ukazuju da, nakon dostizanja određenog praga razvijenosti, turizam podstiče privredni rast, pritom ublažavajući negativne ekološke efekte.

Ključne reči: razvijenost turizma, ekonomski rast, emisija CO_2, dinamička panel regresija sa pragom, Ekološka Kuznetsova kriva
JEL klasifikacija: Z32, O44, Q56, C23

1. Introduction

Tourism is among the most rapidly expanding sectors in the 21st century. The tourism industry plays a crucial role in the global economy, contributing substantially to gross domestic product (GDP), directly and indirectly employing a substantial portion of the global workforce, and holding a notable share in total exports (OECD, 2024). The significance of tourism in global economic development is highlighted by the travel and tourism sector's contribution of 7.6% to global GDP in 2022, marking a 22% increase compared to 2021. The sector's contribution to global employment is also substantial. In the same year, this sector created 295 million jobs (9% of total employment), representing a 7.9% increase compared to 2021 (World Travel & Tourism Council, 2023). Several less-developed countries have enhanced their involvement in the global economy through tourism development. Considering this, many countries, regardless of their level of development, rely on tourism to improve their economic conditions.

Tourism boosts national revenue, encourages investment, creates employment opportunities, contributes to infrastructure development, enables economies of scale for local businesses, facilitates the spread of knowledge, skills, and advanced technologies, and is closely linked to other industries (Brida et al., 2016). This largely demonstrates that tourism has become essential for economies to minimise socio-economic disparities by improving the socio-economic status of individuals. The concept that tourism supports economic expansion is referred to as the tourism-led growth hypothesis (TLGH) (Balaguer & Cantavella-Jorda, 2002). This hypothesis originates from the export-led growth theory, which argues that economic growth is driven not only by increases in labour and capital but also by the expansion of exports (Brida et al., 2016).

However, despite its positive effects on growth and development, the tourism sector can also have negative environmental impacts, primarily due to the increased use of fossil fuels in most tourism activities. The expansion of this sector has resulted in higher fossil energy consumption and significant greenhouse gas emissions, especially carbon dioxide (CO_2) (Jebli et al., 2019). Conversely, the tourism industry is significantly susceptible to climate-related factors, especially extreme weather events, which can lead to security concerns, water scarcity, increased insurance expenses, and diminished destination appeal, ultimately limiting economic prospects for nations (Rigas & Kounetas, 2024).

The environmental impact of tourism development is often empirically investigated through the examination of the Environmental Kuznets Curve (EKC) hypothesis (Lee & Brahmasrene, 2013; Paramati et al., 2017). In the context of tourism and CO_2 emissions, this

relationship suggests a non-linear, inverted U-shaped connection between tourism development and environmental degradation. At the initial stages of tourism development, CO_2 emissions rise due to reliance on fossil fuels and the lack of sustainable practices. As tourism progresses, emissions peak as revenues grow, but environmental awareness and regulations are not yet sufficiently strong. However, after reaching a turning point, further development in tourism reduces CO_2 emissions thanks to increased investments in green technologies, sustainable infrastructure, and stricter environmental policies (Onofrei et al., 2022; Shahnazi & Shabani, 2021).

Given the above, this paper aims to investigate the impact of international tourism on economic growth and CO_2 emissions in the 27 European Union (EU) countries. In other words, the paper tests the correctness of the TLGH on one hand and the legitimacy of the EKC hypothesis on the other. In line with the stated research objective, this paper aims to theoretically and empirically analyse whether and how the level of tourism development affects economic growth and the environment in EU economies.

This research advances the empirical literature by exploring the dynamic interplay between tourism development, economic growth, and CO_2 emissions. Despite the substantial growth of the tourism sector in EU nations, only few studies have investigated the dynamic link between tourism and economic growth, as well as tourism and CO_2 emissions. Additionally, the contribution of this paper lies in the application of a robust econometric methodology, specifically the dynamic panel threshold regression, which, to the best of our knowledge, has not been previously used to analyse the relationships between tourism, economic growth, and CO_2 emissions. The methodology developed by Kremer et al. (2013) for estimating the dynamic panel threshold model allows for the estimation of the threshold value and two different regimes – below and above the threshold – in which the explanatory variable (tourism development) may have different impacts on the dependent variable (economic growth or CO_2 emissions). In other words, this approach enables the detection of non-linear linkages, which is crucial for drawing valid conclusions and formulating effective economic policy measures.

The following research hypotheses are tested in the paper:

H1: An increase in the development of international tourism, measured by the value of international tourists' receipts, positively affects economic growth.

H2: The impact of tourism on increasing CO_2 emissions is lower in countries with higher levels of international tourism development, measured by the value of international tourists' receipts.

H3: In countries with higher levels of economic development, international tourism has a relatively smaller impact on increasing CO_2 emissions.

The first hypothesis is directly linked to the TLGH. If the research confirms H1, it can be concluded that this hypothesis is also valid. The second hypothesis is indirectly related to the EKC, as it predicts that a higher level of tourism development leads to a lower impact of tourism activities on CO_2 emissions. The third hypothesis complements the previous one and is directly linked to the EKC. Specifically, if the research confirms this hypothesis, it can be concluded that in more economically developed countries, the environmental effect of tourism, measured by CO2 emissions, is less harmful.

2. Literature review

Tourism is becoming an increasingly significant part of the economy and a source of revenue in the modern context of globalisation and open markets. Thus, the link between tourism and economic growth is a crucial consideration for policymakers when formulating effective tourism strategies to support sustainable economic development. Academic and applied research lacks agreement on whether tourism propels economic activity or economic growth stimulates tourism expansion, as evolving economic or tourism conditions may reshape the intensity and trajectory of their interplay across periods (Antonakakis et. al., 2015).

Chatziantoniou et al. (2013) identified four types of tourism and economic growth linkages: a unidirectional causality where tourism drives economic growth (Işık et al., 2022; Rivera, 2017; Stančić et al., 2022; Tung, 2021; Xia et al., 2021), a unidirectional causality from economic growth to tourism (Aratuo & Etienne, 2019; Tang, 2011), a bidirectional tourism-economic growth relationship (Antonakakis et al., 2015; Mitra, 2019; Roudi et al., 2019), and a case where there is no relationship between the observed variables (Aliyev & Ahmadova, 2020; Gričar et al., 2021; Kyophilavong et al., 2018).

Numerous studies have explored the tourism-growth connection while considering additional factors such as political stability, trade openness, CO_2 emissions, gross capital investments, and foreign direct investments (Ahmad et al., 2020; Alam & Paramati, 2017; Amin et al., 2019; Azam & Abdullah, 2022; Balsalobre-Lorente & Leitão, 2020; Jambor & Leitão, 2017; Jebli et al., 2019; Mitra, 2019; Shaheen et al., 2019). Jebli et al. (2015) investigated the relationship between economic growth, tourism, and renewable energy in Tunisia from 1990 to 2010. The results indicated a causality from tourism to income per capita and a bidirectional causality between renewable energy and economic growth. Jebli et al. (2019) examined the causal links among renewable energy consumption, tourist arrivals, economic growth, CO_2 emissions and other variables in 22 countries in South and Central America for the period 1995–2010. The authors found that, in the short term, there is a unidirectional causality from economic growth to renewable energy and tourism. However, in the long term, bidirectional causality is observed between renewable energy, tourism, and CO_2 emissions. Jambor and Leitão (2017) analysed the relationship between tourist arrivals and economic growth in Central and Eastern European countries for the period 1995–2014. Their results confirmed that economic growth is positively affected by international tourist arrivals, trade openness, and foreign direct investments. Conversely, a negative correlation between economic growth and CO_2 emissions was found, indicating that economic growth does not necessarily undermine environmental sustainability. Alam and Paramati (2017), using data from the ten countries with the highest contribution of tourism to their GDP, showed that income per capita and trade openness stimulate tourism development. Additionally, they concluded that income per capita positively affects CO_2 emissions, whereas these emissions are negatively correlated with tourist arrivals and trade openness.

Lee and Brahmasrene (2013) analyzed the TLGH for EU economies and found that this hypothesis is valid in the long term. Amin et al. (2019) demonstrated that for South Asian countries, there was a causality from international tourist arrivals to economic growth and from energy consumption to both tourism and economic growth. Balsalobre-Lorente and Leitão (2020) studied the impact of tourist arrivals, renewable energy sources, trade openness, and CO_2 emissions on economic growth in the EU-28 countries from 1995 to 2014. They confirmed that tourism and other variables positively influence economic growth, supporting the TLGH for these countries. Shaheen et al. (2019) investigated the links among tourism, energy, the environment, and economic growth, concluding that tourism contributes to CO_2 emissions and that economic growth is linked to climate change. Ahmad et al. (2020) analyzed the impact of tourism, gross capital formation, and energy

consumption on GDP in selected South Asian countries from 1995 to 2016. They demonstrated that tourism positively affects GDP in the selected countries, confirming TLGH. Additionally, the results confirmed the positive impact of energy consumption and gross investments on GDP. Azam and Abdullah (2022) found that in nine leading Asian tourist countries, including Indonesia, tourism and energy consumption positively affect economic growth.

The dynamics of economic growth - CO_2 emissions linkage also attract significant attention from researchers. This relationship can be viewed from two perspectives: first, a unidirectional causality from emissions to economic growth (Iqbal et al., 2023; Madaleno & Nogueira, 2023; Rigas & Kounetas, 2024) and second, causality from economic growth to CO_2 emissions (Ali et al., 2017; Mensah et al., 2018; Onofrei et al., 2022; Raihan & Tuspekova, 2022; Su et al., 2021; Thi et al., 2023; Ullah et al., 2023).

Shahnazi and Shabani (2021) suggest that this relationship can take six different forms. First, as an inverted U-shape, known as the EKC, which implies that CO_2 emissions increase with economic growth up to a certain point, after which further growth leads to a decrease in emissions. This viewpoint is explained by the fact that, in the early stages of development, countries depend on inexpensive hydrocarbon fuels. As the standard of living improves, these countries turn to adopting renewable energy sources that help reduce CO_2 emissions. Other possible forms include a U-shape, an N-shape, and an inverted N-shape relationship, as well as cases where GDP either reduces CO_2 emissions or where increased economic activity leads to higher CO_2 emissions.

Given the existing research on the relationship between tourism, economic dynamics, and environmental effects, it is evident that empirical findings are mixed. Accordingly, this paper aims to fill the research gap by analysing EU countries and applying advanced econometric methodology based on the dynamic panel threshold regression approach developed by Kremer et al. (2013). In examining the relationships among these variables, a limited number of studies employ threshold methodology in empirical analyses, resulting in less valid statistical inferences regarding the threshold point beyond which this relationship changes. This is particularly important when testing the TLGH and the EKC hypotheses. The econometric method by Kremer et al. (2013) successfully deals with the problem of potential endogeneity of regressors and takes the tourism development variable as both the explanatory variable and the threshold variable.

3. Materials and methods

3.1. Data and descriptive statistics

This study investigates the effect of tourism development on economic growth and CO_2 emissions in 27 EU economies from 1995 to 2020. The starting year is determined by data availability for all EU economies. To obtain more accurate estimates regarding long-term relationships among variables, the time-span concludes in 2020. Specifically, we aim to exclude the severe negative impacts of the COVID-19 pandemic on tourism activity and economic growth dynamics.

Economic growth is measured as a difference between the current period's Gross Domestic Product per capita ($GDPpc$) and that of the previous period. The level of tourism development is quantified using international tourist receipts per capita ($TRpc$) in constant USD, reflecting spending by inbound international visitors, such as payments to domestic transportation providers for cross-border travel. CO_2 emissions are defined as total annual carbon dioxide emissions from the agriculture, energy, waste, and industrial sectors,

excluding Land Use, Land-Use Change, and Forestry (LULUCF), and are standardized to carbon dioxide equivalent, measured in tons per capita.

The estimation model also includes several control variables. Trade openness (TO) is defined as the sum of exports and imports of goods and services, expressed as a percentage of GDP. The inflation rate (INF) is represented by the consumer price index, which tracks the annual percentage change in the cost of a typical basket of goods and services for the average consumer. Gross fixed capital formation per capita ($GFCpc$) is measured in constant 2015 USD and includes fixed investments. Industry (IND) includes the value added (% of GDP) from mining, manufacturing, construction, electricity, water, and gas. Services (SER) refer to the value added, as a percentage of GDP, in sectors such as wholesale and retail trade (including hotels and restaurants), transport, and various services. Population (POP) counts all residents (midyear estimates) regardless of legal status or citizenship.

Data is sourced from the World Bank national accounts data (for GDP per capita, total output, gross fixed capital formation, industry, and services), the Emissions Database for Global Atmospheric Research (EDGAR) (for CO_2 emissions), the World Tourism Organization's Yearbook of Tourism Statistics (for international tourists' receipts), the International Monetary Fund (for inflation), and the United Nations Population Division - World Population Prospects (for population). As recommended by Paramati et al. (2017), all variables are converted into their natural logarithmic form to address issues related to the distributional properties of the data series. This transformation allows each estimated coefficient to be interpreted as an elasticity.

Table 1 reports the descriptive statistics for the abovementioned variables. The panel of EU economies is characterised by relatively stable economic and environmental indicators, as most variables show low or moderate variability.

Table 1: Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. Dev.	Observations
$lnGDPpc$	9.984	11.629	8.172	0.729	702
$lnCO2pc$	2.009	3.259	1.098	0.407	702
$lnTRpc$	6.601	9.292	2.611	1.049	702
$lnTO$	4.603	5.946	3.587	0.451	702
$lnINF$	0.806	6.964	-3.906	1.078	702
$lnGFCpc$	8.405	10.576	4.751	0.781	702
$lnIND$	3.155	3.694	2.299	0.252	702
$lnSER$	4.114	4.383	3.685	0.109	702
$lnPOP$	15.795	18.236	12.841	1.362	702

Source: Authors' research

The scatter plot diagrams (Figures 1 and 2, left panels) visually present the link between tourism development and economic growth, as well as its association with CO_2 emissions, respectively. Both economic growth and CO_2 emissions are positively linked with tourism development. To illustrate the nonlinearity between these variables, LOWESS smoothing is applied (right panels in Figures 1 and 2). LOWESS is a non-parametric technique that does not presume any relationship between the variables (Al Shammre et al., 2023). The LOWESS curves indicate that the correlation between tourism development and growth is nonlinear. The same holds for the relationship between tourism development and CO_2 emissions, highlighting the presence of threshold effects. Therefore, the preliminary data analysis suggests employing the threshold regression approach.

3.2. Econometric method

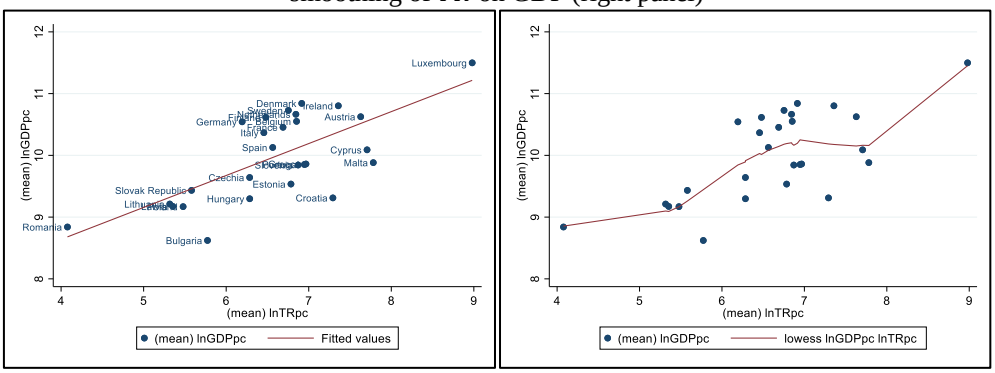
To examine the nexus between tourism development and economic growth and tourism development and CO_2 emissions, the following two models are employed:

$$GDPpc_{it} = \alpha_i + \beta TRpc_{it} + \delta_1 TO_{it} + \delta_2 INF_{it} + \delta_3 GFCpc_{it} + \delta_4 IND_{it} + \delta_5 SER_{it} + \delta_6 POP_{it} + \theta_t + \varepsilon_{it} \quad (1)$$

$$CO2pc_{it} = \alpha_i + \beta TRpc_{it} + \delta_1 TO_{it} + \delta_2 GFCpc_{it} + \delta_3 IND_{it} + \delta_4 SER_{it} + \delta_5 POP_{it} + \delta_6 GDPpc_{it} + \theta_t + \varepsilon_{it} \quad (2)$$

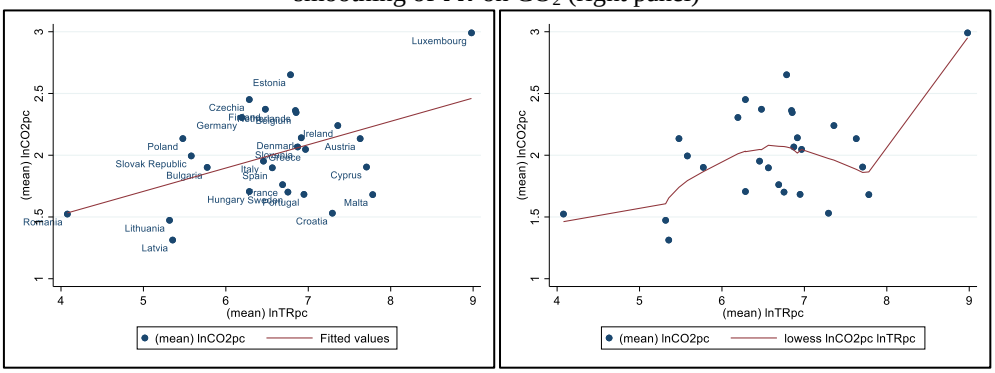
where $GDPpc$ represents the GDP per capita growth rate, $CO2pc_{it}$ stands for CO_2 emissions in tons per capita, i denotes the country (i = 1, …, N), t represents the time (t = 1, …, T), α_i denotes an unobservable country-specific effect, θ_t is the time-specific effect, β and δ_1 - δ_6 are the coefficients of the explanatory variable and the control variables (TO, INF, GFC, IND, SER, and POP), respectively, and ε is an error term.

Figure 1: The scatter plot for the mean values of TR and GDP (left panel) and LOWESS smoothing of TR on GDP (right panel)



Source: Authors' research

Figure 2: The scatter plot for the mean values of TR and CO_2 (left panel) and LOWESS smoothing of TR on CO_2 (right panel)



Source: Authors' research

As the data presented in Figures 1 and 2 suggest the non-linear (threshold) effects in the impact of tourism development on economic growth (CO_2 emissions), the dynamic panel threshold regression model proposed by Kremer et al. (2013) is applied. This method is founded on the General Method of Moments (GMM) approach. It builds on the static

threshold model introduced by Hansen (1999) and the cross-sectional threshold framework proposed by Caner and Hansen (2004), utilizing Generalized Method of Moments (GMM) estimators to address endogeneity within a dynamic context. In such a way, it successfully copes with the potential endogeneity of regressors. It also allows the explanatory variable (tourism development in this study) to be a threshold variable simultaneously. Furthermore, this approach utilizes the forward orthogonal deviations conversion, ensuring that the original threshold model applied to static panels in Hansen (1999) remains appropriate in a dynamic setting (Kremer et al., 2013). As Kremer et al. (2013) suggested, the instrument variables should include the lagged dependent variable, the exogenous variable, and the other covariates. Accordingly, models 1 and 2 can be transformed as follows:

$$GDPpc_{it} = \alpha_i + \beta_0 GDPpc_{it-1} + \beta_1 TRpc_{it}\, I(TRpc_{it} \le \gamma) + \beta_2 TRpc_{it}\, I(TRpc_{it} > \gamma) + \delta_1 TO_{it} + \delta_2 INF_{it} + \delta_3 GFCpc_{it} + \delta_4 IND_{it} + \delta_5 SER_{it} + \delta_6 POP_{it} + \theta_t + \varepsilon_{it} \quad (3)$$

$$CO2pc_{it} = \alpha_i + \beta_0 CO2pc_{it-1} + \beta_1 TRpc_{it}\, I(TRpc_{it} \le \gamma) + \beta_2 TRpc_{it}\, I(TRpc_{it} > \gamma) + \delta_1 TO_{it} + \delta_2 GFCpc_{it} + \delta_3 IND_{it} + \delta_4 SER_{it} + \delta_5 POP_{it} + \delta_6 GDPpc_{it} + \theta_t + \varepsilon_{it} \quad (4)$$

where γ denotes the tourism development threshold value that is estimated, I represents the indicator variable with the value of 1 if the condition in the parenthesis is fulfilled and 0 otherwise, β_1 and β_2 represent the coefficients of the tourism development effect on economic growth (CO_2 emissions in Equation 4) below and above the threshold value of tourism development, respectively, whereas δ_1 - δ_6 are the coefficients of the covariates.

To empirically test the EKC (i.e. the assumption that a higher level of economic development, measured by GDP per capita, results in a lower impact on the environment measured by CO_2 emissions), the model from Equation 4 is modified by using GDP per capita growth as a threshold variable:

$$CO2pc_{it} = \alpha_i + \beta_0 CO2pc_{it-1} + \beta_1 TRpc_{it}\, I(GDPpc_{it} \le \gamma) + \beta_2 TRpc_{it}\, I(GDPpc_{it} > \gamma) + \delta_1 TO_{it} + \delta_2 GFCpc_{it} + \delta_3 IND_{it} + \delta_4 SER_{it} + \delta_5 POP_{it} + \theta_t + \varepsilon_{it} \quad (5)$$

In further analysis, the model from Equation (5) is called Model 2a. By estimating this model, it is addressed whether a higher level of economic development (above the threshold) leads to lower emissions compared to the economic development below the threshold.

Utilising this method generates estimates that asymptotically align with a normal distribution. Consequently, the standard Wald test can be employed to assess the existence of a threshold. Therefore, the nonlinearity test using the $supW = supW_n(\gamma)$ statistic is performed, where the null hypothesis is $\beta - \delta = 0$, and $W_n(\gamma)$ represents the standard Wald statistic for each fixed value of γ.

To examine the dynamic bivariate panel causality among dependent, explanatory, and control variables, the study utilizes the heterogeneous panel causality model proposed by Dumitrescu and Hurlin (2012). This approach evaluates the null hypothesis of uniform non-causality against the alternative hypothesis of non-uniform (heterogeneous) causality across units. For each cross-sectional unit, Wald statistics are calculated separately to assess Granger non-causality. The overall panel test statistic is then determined by averaging these individual Wald statistics across cross-sections. This model effectively accounts for heterogeneity, performs well with small panel datasets, and manages cross-sectional dependence. These strengths make it a suitable choice for causality analysis in this research.

4. Results and discussion

Prior to econometric estimation, the presence of cross-sectional dependence should be examined. Table 2 reports the results of the cross-section dependence test developed by Pesaran (2021). The results indicate a firm rejection of the null hypothesis of no cross-section dependence at the 1% significance level. Therefore, the second-generation panel unit root test is employed. The results of the Cross-section Im-Pesaran-Shin (CIPS) test proposed by Pesaran (2007) are presented in the right panel of Table 2. All variables are integrated of order *I*(1) since they are nonstationary at levels and stationary at the first differences. This indicates that implementing the dynamic panel regression model proposed by Kremer et al. (2013) is justified. Specifically, this approach relies on first-differenced GMM estimates.

Though visually represented in Figures 1 and 2, the non-linearity and threshold effects should be confirmed more formally. To achieve this, the slope homogeneity test by Pesaran and Yamagata (2008) is used. If a threshold effect exists, the slope coefficients will differ before and after the threshold. The results from Table 3 demonstrate that the delta statistic achieves statistical significance, thereby rejecting the null hypothesis that slope coefficients are homogenous. This suggests a non-linear relationship in both Model 1 and Model 2. Model 2a is not tested for slope homogeneity because it contains the same variables as Model 2.

Table 2: The results of cross-section dependence and CIPS unit root tests

Variable	**Cross-section dependence test statistic**	**CIPS unit root test results**	
		Level	**First difference**
$lnGDPpc$	79.822***	-0.314	-3.091***
$lnCO2pc$	47.299***	-2.011	-4.136***
$lnTRpc$	63.722***	-2.313	-3.908***
$lnTO$	71.287***	-1.816	-3.565***
$lnINF$	46.612***	-1.643	-4.649***
$lnGFCpc$	51.459***	-2.525	-4.264***
$lnIND$	49.324***	-2.166	-4.075***
$lnSER$	61.844***	-2.335	-3.958***
$lnPOP$	5.799***	-1.249	-2.438***

Note: Pesaran CD test statistic values are presented. Deterministic components: constant and trend. ***, **, and * signify statistical significance at 1%, 5% and 10%, respectively
Source: Authors' research

Table 3: Slope homogeneity test results

Indicator	**Model 1**		**Model 2**	
	Coefficient	**Probability**	**Coefficient**	**Probability**
Delta	14.863	0.000	16.810	0.000
Adj. delta	18.947	0.000	21.428	0.000

Note: The test is performed using *xthst* command in Stata. H_0: Slope coefficients are homogenous
Source: Authors' research

Table 4 reports the estimates of the dynamic panel threshold regression model. For Model 1, the threshold value of the international tourists' receipts is 6.856. Given that the natural logarithm of this variable is included, the antilog value should be calculated. Specifically, it

is $949.6 per capita as a threshold value. Below this threshold, a one percentage point (p.p.) increase in tourists' receipts leads to a 0.019 p.p. increase in economic growth. On the other hand, above the threshold, a one p.p. rise in tourists' receipts produces a 0.017 p.p. increase in growth. This suggests relatively minor differences between the effects of tourism development on growth. However, supWald statistics is statistically significant, confirming the presence of non-linearity. The positive effects of tourism development on economic growth support the TLGH. As for the covariates' coefficients, they mainly show expected signs and magnitudes. Increased trade openness and gross fixed capital lead to higher economic growth, as suggested by several studies (Alam & Paramati, 2017; Jambor & Leitão, 2017; Jebli et al., 2019). In contrast, an increase in the share of industry and services in GDP, along with a rising population, adversely affects economic growth per capita, confirming, for instance, the findings of Paramati et al. (2017) for developed economies.

Table 4: Estimation results from the dynamic panel threshold regression

Variables	**Model estimates**		
	Model 1	**Model 2**	**Model 2a**
Threshold variable	$TRpc$	$TRpc$	$GDPpc$
Threshold estimate (γ)	6.856***	7.478***	9.774***
95% Conf. Interval	[6.7, 6.9]	[6.6, 7.8]	[9.6, 9.8]
	Impact of $TRpc$ on $GDPpc$	Impact of $TRpc$ on $CO2pc$	Impact of $TRpc$ on $CO2pc$
$\hat{\beta}_1$	0.019***	0.041***	0.029**
$\hat{\beta}_2$	0.017***	0.037***	0.025**
Impact of covariates			
$GDPpc_{t-1}$	0.661***	-	-
$CO2_{t-1}$	-	0.782***	0.852***
TO	0.139***	-0.191***	0.011
INF	-0.001*	-	-
$GFCpc$	0.159***	-0.054*	-0.057**
IND	-0.109**	0.064	0.423***
SER	-2.221***	-0.479***	0.266**
POP	-0.145***	-0.249***	-0.136
$GDPpc$	-	0.139***	-
$Const.$	4.855***	5.824***	-1.902**
Observations	675	675	675
Number of instruments	480	480	301
SupWald Statistic (p-value)	1357.93 (0.000)	1044.99 (0.000)	167.50 (0.000)

Note: ***, **, and * signify statistical significance at 1%, 5%, and 10%, respectively. The results are estimated using the *xtendothresdpd* command in Stata, proposed by Diallo (2020).
Source: Authors' research

Model 2 represents the impact of tourism development on CO_2 emissions. The estimated threshold is 7.478, which corresponds to the antilog value of $1,768 per capita. Below this value, a one p.p. increase in the tourists' receipts leads to a 0.041 p.p. increase in CO_2 emissions. When the tourists' receipts are above the threshold value, its growth for one p.p. leads to a 0.037 p.p. rise in CO_2 emissions. In other words, the higher the tourism development level, the lower the impact of tourism on CO_2 emissions. The control variables' coefficients are mainly negative. This suggests that an increase in trade openness, the share

of industry and services in GDP, population, and the share of fixed investments in GDP leads to a reduction in CO_2 emissions. Finally, it appears that the estimation results of Model 2a support the EKC hypothesis. Namely, when the level of economic development (measured by GDP per capita growth) is below the threshold of 9.774, a one p.p. increase in tourists' receipts leads to a 0.029 p.p. rise in CO_2 emissions. However, when the $GDPpc$ is above the threshold, the increase in CO_2 emissions is lower (0.025 p.p.). The antilog value of the threshold is $17,570. To put it differently, in countries with GDP per capita higher than this value, tourism produces lower CO_2 emissions, which is aligned with the postulates of the EKC. The covariates exhibit the expected impact on the dependent variable.

The causality between variables is tested employing Dumitrescu and Hurlin (2012) heterogenous panel causality test (Table 5). The bidirectional causality is confirmed between tourists' receipts and CO_2 emissions, which is aligned with similar studies (Ahmad et al., 2020; Paramati et al., 2017; Shaheen et al., 2019). This suggests that the two variables influence each other in the short term. A similar hold when it comes to the relationship between CO_2 emissions and other variables. However, the unidirectional causality from GDP per capita (and the share of services in GDP) to CO_2 emissions is identified. This implies that the emissions are driven by economic activity and not *vice versa*. On the other hand, there is unidirectional causality from tourism development to economic growth, which is in line with the TLGH. This relationship is documented in several studies (Işık et al., 2022; Stančić et al., 2022; Tung, 2021; Xia et al., 2021). As for other variables, the bidirectional causality with economic growth is identified. The exception is the unidirectional causality from trade openness to economic growth.

Table 5: The results of heterogenous panel causality test (Dumitrescu-Hurlin)

Null Hypothesis	**Zbar-Statistic**	**Null Hypothesis**	**Zbar-Statistic**
TR ↛ GDP	1.754*	TR ↛ CO_2	9.528***
GDP ↛ TR	-0.086	CO_2 ↛ TR	4.594***
TO ↛ GDP	2.769***	TO ↛ CO_2	3.120***
GDP ↛ TO	0.259	CO_2 ↛ TO	1.757*
INF ↛ GDP	9.663***	GDP ↛ CO_2	7.563***
GDP ↛ INF	2.532**	CO_2 ↛ GDP	0.882
GFC ↛ GDP	3.993***	GFC ↛ CO_2	4.997***
GDP ↛ GFC	13.952***	CO_2 ↛ GFC	2.436**
IND ↛ GDP	6.238***	IND ↛ CO_2	4.308***
GDP ↛ IND	10.074***	CO_2 ↛ IND	3.014***
SER ↛ GDP	3.266***	SER ↛ CO_2	3.715***
SER ↛ GFC	13.022***	CO_2 ↛ SER	-0.008
POP ↛ GDP	3.159***	POP ↛ CO_2	9.580***
GDP ↛ POP	15.329***	CO_2 ↛ POP	7.486***

Note: Sign "↛" means "does not homogeneously cause"
***, **, and * signify statistical significance at 1%, 5% and 10%, respectively
Source: Authors' research

One can conclude that the research hypotheses in this paper – H1 (tourism development positively affects economic growth), H2 (higher tourism development reduces the marginal increase in CO_2 emissions), and H3 (higher economic development diminishes tourism's environmental impact) – are empirically confirmed. The dynamic panel threshold analysis reveals that tourism stimulates economic growth across EU countries, supporting the TLGH. Simultaneously, the EKC hypothesis holds: when international tourism receipts exceed

$1,768 per capita or GDP per capita surpasses $17,570, the marginal rise in CO_2 emissions from tourism decreases. This indicates that advanced economies leverage sustainable practices, green technologies, and stricter regulations to decouple tourism growth from environmental harm. Economically, these findings underscore the dual role of tourism as a growth driver and a sector where environmental sustainability can be achieved through targeted policies, particularly in high-income nations. The results advocate for policies that promote tourism while incentivizing green infrastructure and emission-reducing innovations to align economic and environmental goals.

The findings of this study align with several previous studies supporting the TLGH and EKC hypotheses (Işık et al. 2022; Rivera, 2017; Stančić et al. 2022). For instance, Balsalobre-Lorente and Leitão (2020) also confirm that international tourism positively affects growth in EU countries, with the impact being more pronounced in nations with higher economic development levels. Similarly, Lee and Brahmasrene (2013) identify a long-term relationship between tourism, economic growth and CO_2 emissions, reinforcing the conclusion that tourism is a key factor of economic expansion while exhibiting a nonlinear relationship with environmental degradation. In contrast, some studies challenge the TLGH, particularly in less developed economies. Kyophilavong et al. (2018) found no significant causal relationship between tourism and economic growth in Laos, suggesting that other macroeconomic factors may play a more substantial role in driving economic performance.

Regarding the tourism environmental effect, the study's findings support the EKC hypothesis, consistent with research by Jebli et al. (2019), who demonstrated that tourism-led CO_2 emissions initially rise but they decline after a certain income threshold is surpassed. However, Shaheen et al. (2019) present differing results, arguing that the tourism industry consistently increases CO_2 emissions without a clear turning point, especially in countries with weaker environmental regulations. The variation in findings across studies suggests that the effectiveness of sustainable tourism policies and green investments may significantly influence the environmental outcomes of tourism development.

5. Conclusion

This study provides empirical insights into the dynamic relationship between tourism development, economic growth, and CO_2 emissions within the EU using a dynamic panel threshold regression approach. The research confirms the validity of both the TLGH and the EKC hypotheses. The findings demonstrate that an increase in tourism development, measured by international tourists' receipts, positively impacts economic growth. Simultaneously, the environmental impact of tourism is found to be nonlinear, with higher levels of economic and tourism development contributing to a lower marginal increase in CO_2 emissions. The results suggest that tourism can be a sustainable driver of economic growth when managed effectively, ensuring that environmental impacts are mitigated through policy interventions and technological advancements.

A key contribution of this study is the identification of threshold effects in the relationship between tourism development and economic growth, as well as between tourism development and CO_2 emissions. The empirical results indicate that when international tourists' receipts per capita exceed $1,768 or when GDP per capita surpasses $17,570, the negative environmental impact of tourism declines. These findings imply that countries with higher levels of economic development can implement sustainable tourism strategies, invest in green infrastructure, and enforce stricter environmental policies to counterbalance the adverse effects of tourism.

Despite its contributions, this research is not without limitations. Firstly, the study concentrates solely on EU countries, which restricts the ability to generalise the findings to other regions with differing economic structures and environmental policies. Future studies should explore similar relationships in developing economies where tourism may have a more pronounced impact on both growth and emissions due to weaker regulatory frameworks. Secondly, while the study controls for key economic and environmental variables, it does not explicitly account for the role of renewable energy adoption and technological innovations in mitigating tourism-induced CO_2 emissions. Incorporating these factors in future research could provide a more comprehensive understanding of sustainable tourism development. Another limitation relates to the dataset used in the analysis. The study covers the period from 1995 to 2020, which excludes the potential long-term impacts of the COVID-19 pandemic on tourism, economic recovery, and environmental sustainability. Given the significant disruptions in the tourism sector caused by the pandemic, future research should investigate how the post-pandemic economic landscape has altered the dynamics between these variables. Moreover, expanding the scope to include more granular data on tourism activities, such as domestic tourism, different modes of travel, and the carbon intensity of tourism-related industries, could offer deeper insights into policy implications. Future research should also explore the effectiveness of specific policy interventions in enhancing the sustainability of tourism-led growth. Comparative studies between EU and non-EU countries could help identify best practices that can be replicated globally.

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Conflict of interest

The authors declare no conflict of interest.

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Empirical analysis of tourists' intentions regarding food waste in Serbian hotel industry

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Abstract

Purpose – Food waste management is becoming an increasingly significant global challenge, especially in the hospitality industry, where large amounts of waste are generated, leading to negative environmental, social and economic consequences. This research explores how tourists perceive food waste in Serbian hotels, aiming to uncover the main psychological drivers that influence their intentions to minimize such waste. **Methodology** – The study uses an adapted Norm Activation Model (NAM) to analyze the effects of awareness of the consequences of food waste, sense of responsibility and personal norms regarding tourists' intentions. **Results** – The results indicate that these factors significantly contribute to shaping sustainable behavior, with awareness of the consequences being the most critical. **Implications** – Incorporating psychological insights into food waste strategies, as suggested by the findings, could serve as a catalyst for implementing sustainable measures in hospitality services.

Keywords: food waste management, hospitality industry, Norm Activation Model, tourist attitudes, sustainable behavior
JEL classification: L66, L83, Z32

Empirijska analiza namera turista u pogledu otpada od hrane u hotelijerstvu Srbije

Sažetak

Svrha – Upravljanje otpadom od hrane postaje sve značajniji globalni izazov, posebno u ugostiteljskoj industriji, gde se stvaraju velike količine otpada, što dovodi do negativnih ekoloških, društvenih i ekonomskih posledica. Ovo istraživanje ispituje kako turisti doživljavaju otpad od hrane u hotelima u Srbiji, sa ciljem da identifikuje glavne psihološke pokretače koji utiču na njihovu nameru da taj otpad svedu na minimum. **Metodologija** – Studija koristi prilagođeni model aktivacije normi (NAM) za analizu efekata svesti o posledicama rasipanja hrane, osećaja odgovornosti i ličnih normi na namere turista. **Rezultati** – Rezultati ukazuju da ovi faktori značajno doprinose oblikovanju održivog ponašanja, pri čemu je svest o posledicama najkritičnija. **Implikacije** – Uključivanje psiholoških uvida u strategije upravljanja otpadom od hrane, kako to sugerišu rezultati

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istraživanja, moglo bi poslužiti kao pokretač za sprovođenje održivih mera u sektoru ugostiteljstva.

Ključne reči: upravljanje otpadom od hrane, ugostiteljstvo, model aktivacije normi, stavovi turista, održivo ponašanje
JEL klasifikacija: L66, L83, Z32

1. Introduction

Global food waste management represents one of the key challenges of sustainable development, as excessive food disposal negatively impacts the environment, economic stability, and social responsibility (Faishal, 2022; Radde et al., 2025). Within the hospitality industry, particularly in hotels and restaurants, the issue of food waste is increasingly evident, driven by the large volumes of food that are prepared but not consumed, which contributes to greater waste and environmental impact (Setiawan & Puspitasari, 2023). A particularly concerning aspect is that a significant portion of discarded food could be redistributed or utilized more efficiently through waste reduction strategies, yet such approaches have not been systematically implemented.

In Serbia, the problem of food waste within the hotel industry has received limited attention and remains insufficiently addressed, even though the tourism sector continues to expand. Hotels face challenges in maintaining service quality, meeting guest expectations, and simultaneously reducing negative environmental impacts (Gajić et al., 2023; Martin-Rios et al., 2020). The quality of hotel services is a key factor in ensuring guest satisfaction; however, it is still unclear to what extent sustainable practices and effective food waste management impact visitor' perceptions and their loyalty (Awasthi et al., 2020; Gajić et al., 2023; Tavil, 2020). The lack of well-defined guidelines and the insufficient breadth of research in this field reveal notable gaps in the existing literature that warrant further investigation.

This study aims to explore how awareness of the consequences of food waste, a sense of personal responsibility, and individual moral norms contribute to shaping tourists' intentions to reduce food waste in hotels across Serbia. The application of the Norm Activation Model (NAM) allows for a deeper understanding of the psychological factors that drive sustainable guest behavior, providing a theoretical framework for assessing their intentions. The motivation for conducting this research stems from the need to fill the gap in understanding tourists' attitudes toward food waste in the hotel industry, as previous studies have not fully incorporated all relevant psychological aspects of decision-making related to waste reduction. Additionally, the findings will offer practical recommendations for hoteliers, enabling them to implement strategies to raise awareness and encourage responsible guest behavior.

The novelty of this study is reflected in its application of a theoretical framework that brings together essential psychological determinants of decision-making related to food waste management in hotels. By applying the NAM model within the Serbian context, the research offers meaningful insights for developing sustainable business strategies and enriches the academic work on sustainable tourism and hospitality.

2. Theoretical background

Food waste management remains a major challenge in the hospitality sector, as the excessive discarding of food results in substantial environmental, economic, and social consequences. Existing research indicates that psychological elements such as awareness of impacts,

perceived responsibility, and internalized personal norms are crucial in fostering sustainable consumer behavior (Setiawan & Puspitasari, 2023). Despite an expanding body of work on food waste, studies that specifically examine the psychological drivers behind tourists' behavior in hotel settings are still limited (Berjan et al., 2022; Huang et al., 2021).

One of the most widely used theoretical frameworks in this field is the Norm Activation Model (NAM), which explains how moral norms shape pro-social behavior (Ebreo et al., 2003). This model suggests that when individuals recognize the severe consequences of food waste, they are more likely to cultivate a sense of personal responsibility and intrinsic motivation to minimize it. Rastegari et al. (2023) combined the Norm Activation Model (NAM) with the Theory of Planned Behavior (TPB) in their study on food waste practices among retailers, demonstrating that a heightened sense of responsibility serves as a crucial determinant of sustainable behavioral outcomes. Similarly, Teng et al. (2022) emphasized that moral norms and awareness of consequences are critical factors in preventing food waste, particularly in the restaurant and hotel sectors. Mahasuweerachai (2024) used the NAM model to analyze food safety behavior among restaurant employees, highlighting that personal responsibility and moral norms are crucial for adopting sustainable practices. These findings suggest that similar mechanisms may play a vital role in encouraging sustainable tourist behavior, particularly in hotels, where responsibility for food waste is often shifted to hotel management.

Beyond studies focused on professional settings, research indicates that consumer intentions regarding food waste are strongly influenced by personal norms and values. Shin et al. (2018) analyzed consumer behavior toward organic food and found that a combination of NAM and TPB effectively explains consumer choices, which is also relevant for understanding decision-making regarding food waste reduction in hotels. Similarly, Panda et al. (2024) applied this theoretical framework to examine household food waste management, confirming that personal norms play a fundamental role in determining whether food leftovers are reused or discarded. Additional research confirms that awareness of food waste consequences, both environmental and economic, promotes sustainable behavior. Rastegari Kopaei et al. (2021) emphasized the importance of combining NAM with knowledge about composting, showing that informed consumers are more likely to engage in responsible behavior. Similarly, Lee et al. (2023) expanded the NAM model by incorporating situational expectancy and value theories, demonstrating that sustainable behavior is more likely to develop when individuals perceive high personal relevance and benefits from reducing food waste.

Within the hotel industry, research shows that tourists frequently do not take personal responsibility for food waste, viewing it instead as a matter that falls under the hotel's management and operational duties (Okumus et al., 2020; Özekici, 2022; Vukolić et al., 2025). However, when awareness of the negative consequences of food waste increases, motivation to reduce food waste also rises. Based on these findings, we propose the following hypothesis:

H1: Awareness of food waste consequences (AC) positively influences tourists' intentions to reduce food waste in hotels (BI).

In addition to awareness of consequences, a sense of responsibility is a critical factor in encouraging sustainable behavior. Studies indicate that individuals who feel personally accountable for environmental issues are more inclined to engage in pro-social behaviors (Ebreo et al., 2003; Mak et al., 2020; Rastegari et al., 2023). Within this framework, we propose the following hypothesis:

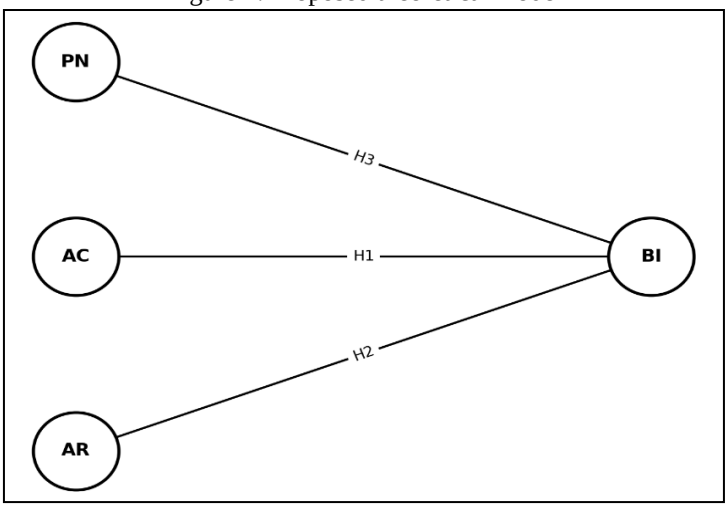
H2: The sense of personal responsibility for food waste reduction (AR) positively influences tourists' intentions to reduce food waste in hotels (BI).

Personal norms are recognized as another key psychological factor influencing consumer intentions. In their study, Setiawan and Puspitasari (2023) utilized the Norm Activation Model (NAM) to investigate how personal moral standards affect consumers' willingness to reduce food waste in all-you-can-eat restaurants, concluding that moral obligations serve as strong predictors of environmentally responsible behavior. This supports the argument that stronger personal norms lead to a higher likelihood of food waste reduction. Similarly, Ananno et al. (2021) emphasized the importance of personal norms in promoting environmentally responsible actions within the hospitality sector. Their study found that tourists with heightened moral standards and a sense of duty toward sustainability were more willing to adopt practices aimed at reducing food waste. These findings are consistent with prior studies, strengthening the view that well-developed personal norms and a heightened sense of responsibility are critical in encouraging tourists to adopt sustainable behaviors related to food consumption. Building upon these findings, we propose the following hypothesis:

H3: Personal norms regarding responsible food waste behavior (PN) positively influence tourists' intentions to reduce food waste in hotels (BI).

While most of the cited studies confirm the relevance of the NAM model across different contexts, there remains a lack of empirical studies applying this model to the hotel sector. Rastegari et al. (2023) examined food waste management in the retail sector, whereas most research has focused on restaurants and households, overlooking the specific factors that shape tourists' behavior in hotels. This research seeks to address the identified gap by utilizing the Norm Activation Model (NAM) to examine the influence of consequence awareness, perceived responsibility, and personal norms on tourists' intentions to minimize food waste in hotels across Serbia.

Figure 1: Proposed theoretical model



Source: Authors' research

While the Norm Activation Model (NAM) offers a solid theoretical foundation for interpreting sustainable behaviors such as food waste reduction, various scholars have pointed out its conceptual and methodological shortcomings. Talwar et al. (2022) argue that the NAM model does not adequately account for emotional and situational factors, which can significantly influence decision-making. For instance, beyond moral norms and personal responsibility, feelings of pride or shame may further encourage or discourage pro-

environmental behavior, yet the model does not recognize these as key mechanisms. Another challenge associated with NAM is the gap between intentions and actual behavior. Fraj-Andrés et al. (2023) examined the food waste reduction intentions of young consumers in Spain and found that, despite expressing high intentions to reduce food waste, their actual behavior did not align with these claims. This suggests a potential overestimation of moral norms in self-reported surveys, which may lead to bias in the results. In other words, NAM assumes that internalized norms will automatically lead to sustainable behavior, which is not always the case in real-world scenarios. Additionally, one of the key criticisms of the NAM model is its weak interaction with external factors, such as economic feasibility, legal regulations, or social norms that are not necessarily moral in nature. For example, consumers may have well-developed moral norms, but if hotel policies and offerings encourage excessive consumption, reducing food waste becomes challenging. Fraj-Andrés et al. (2023) suggest that, NAM should be integrated with other behavioral theories, such as the Theory of Planned Behavior (TPB) or the Value-Belief-Norm (VBN) Theory, to provide a more realistic assessment of environmentally responsible behavior and to better understand the multiple factors influencing consumer behavior.

3. Methodology

3.1. Sample and procedure

The study was conducted between August 2024 and January 2025, targeting tourists staying in four- and five-star hotels in Belgrade (278), Novi Sad (153), Kopaonik (154), and Divčibare (104). The total sample consisted of 689 respondents, representing a response rate of 68.9% from the 1,000 distributed surveys. These locations were selected to capture diverse tourism profiles, including urban, mountain, and leisure-oriented destinations. A structured, self-administered questionnaire was used for data collection. The survey was conducted in person, with printed copies distributed at hotel receptions, dining areas, and designated guest lounges. Trained hotel staff, in coordination with the research team, facilitated survey distribution, ensuring participants understood the purpose of the study. To encourage participation, respondents were informed that the survey was anonymous and designed to explore food waste awareness and behavior in hotels.

Prior to the main study, a pilot test was conducted with 50 hotel guests to evaluate the clarity and reliability of the questionnaire. Based on their feedback, minor adjustments were made to improve readability and ensure the accuracy of responses. The final questionnaire consisted of four sections: sociodemographic characteristics, awareness of food waste consequences, perceived responsibility, and behavioral intentions regarding food waste reduction in hotels. To address potential moral hazard, participants were assured that their responses would not affect their hotel experience. Additionally, social desirability bias was minimized by emphasizing that there were no right or wrong answers. The study was designed to ensure voluntary participation, with no incentives provided to maintain response authenticity.

The sample was evenly distributed by gender, with 50.8% male and 49.2% female respondents. The largest age group was 30–39 years (28.7%), followed by 40–49 years (25.8%), indicating that middle-aged tourists were the most represented. Higher education levels were dominant, with 45.3% holding a bachelor's degree and 27.4% a master's degree, suggesting a well-educated sample. The majority of respondents were domestic tourists (70.7%), while 29.3% were international visitors. Regarding travel purposes, 56.3% visited hotels for leisure, whereas 43.7% were business travelers, highlighting a balanced mix of motivations for hotel stays (Table 1).

Table 1: Socio-demographic characteristics of respondents

Characteristic	Category	Frequency (N)	Percentage (%)
Gender	Male	350	50.8
	Female	339	49.2
Age Group	18–29	144	20.9
	30–39	198	28.7
	40–49	178	25.8
	50–59	102	14.8
	60 and above	67	9.7
Education	High school	110	16.0
	Bachelor's degree	312	45.3
	Master's degree	189	27.4
	PhD	78	11.3
Nationality	Serbian	487	70.7
	Foreign	202	29.3
Type of Stay	Business	301	43.7
	Leisure	388	56.3

Source: Authors' research

3.2. Measurements

The measurement items used in this study were adapted and modified based on previous research that applied the Norm Activation Model (NAM) to examine food waste reduction behavior (Kim et al., 2022; Nurisusilawati et al., 2024; Wang et al., 2022). Given the specific context of this study tourists' awareness, responsibility, and behavioral intentions regarding food waste reduction in hotels in Serbia the original items were adjusted to reflect the hospitality industry setting. The measurement scales were constructed following established psychometric principles, ensuring content validity and construct reliability. All statements were evaluated using a seven-point Likert scale, where 1 indicated strong disagreement and 7 represented strong agreement.

Table 2 shows the respondents' attitudes towards the use of hotel surplus food through donations. There are currently no regulations in place to support the donation of surplus food from restaurants and hotels in Serbia, which significantly limits the implementation of sustainable practices in the hotel sector. This lack of regulation can lead to increased food waste, as hotels often do not have the opportunity to divert surplus food to beneficial purposes such as donations to food centers or other humanitarian organizations.

A solution to this problem could be found through the introduction of legal regulations that would enable and support food donation as part of sustainable practices in the hotel sector. This would involve clear guidelines and procedures that would allow hotels and restaurants to safely and efficiently donate surplus food, while also addressing social and environmental challenges. The introducing of such measures could significantly reduce food waste and improve the reputation of hotels that implement sustainable practices.

Table 2: Factors and statements

Factor	Abbreviation	Statement
Awareness of Consequences (AC)	AC1	Food waste in hotels is a serious environmental problem.
	AC2	Food waste contributes to increased carbon dioxide emissions and climate change.
	AC3	Excess food from hotels could be better utilized through donations instead of being discarded.
	AC4	Minimizing food waste in hotels can play a significant role in promoting sustainable tourism.
Ascription of Responsibility (AR)	AR1	I feel responsible for reducing the amount of food I waste in a hotel.
	AR2	Tourists should take greater responsibility for reducing food waste in hotels.
	AR3	Hotel management holds the primary responsibility for preventing food waste.
	AR4	I experience a sense of guilt when I leave food uneaten on my plate in a hotel restaurant.
Personal Norms (PN) –	PN1	I try not to order more food than I can eat when staying in a hotel.
	PN2	When staying in hotels, I choose smaller portions to reduce food waste.
	PN3	I support hotel initiatives to reduce food waste, even if it means a less diverse menu.
Behavioral Intentions (BI)	BI1	I would support a hotel that implements food waste reduction policies.
	BI2	I am prepared to spend a bit more on meals if the hotel adopts environmentally sustainable practices to reduce food waste.
	BI3	If a hotel offers portion size options, I would always choose a smaller portion to reduce food waste.
	BI4	I believe that hotels should actively promote food waste reduction and involve guests in this process.

Source: Authors' research

3.3. Data analysis

The dataset was examined using SPSS 26 to perform initial descriptive analyses and exploratory factor analysis (EFA), while SmartPLS 4 was employed for confirmatory factor analysis (CFA) and structural equation modeling (SEM). This multi-step analytical approach ensured the validity, reliability, and strength of the proposed conceptual model. The descriptive analysis confirmed that all variables adhered to normal distribution assumptions, with skewness and kurtosis values falling within the acceptable ±1.5 range (Beauducel & Wittmann, 2005). EFA was carried out using principal component analysis (PCA) with varimax rotation. The Kaiser-Meyer-Olkin (KMO) statistic yielded a value of 0.906, surpassing the 0.80 threshold and indicating sampling adequacy. Additionally, Bartlett's test of sphericity was highly significant (χ^2 = 4,152.74, df = 231, $p < 0.001$), confirming the dataset's suitability for factor extraction. Items with loadings below 0.50 were excluded, and the final EFA model accounted for 74.3% of the total variance, meeting the recommended criteria for construct validity (Beauducel & Wittmann, 2005). CFA further supported the

measurement model's validity, with all constructs achieving average variance extracted (AVE) values above 0.50, indicating strong convergent validity. Composite reliability (CR) values ranged from 0.836 to 0.921, confirming high internal consistency across all constructs. Discriminant validity was tested using the Fornell-Larcker criterion, ensuring that each construct's AVE square root was greater than its correlations with other constructs (Marsh et al., 2019). Additionally, the Heterotrait-Monotrait (HTMT) ratio remained below the 0.85 threshold, supporting discriminant validity. Correlation analysis indicated moderate to strong relationships among the constructs, with all correlation coefficients significant at $p < 0.01$ (Marsh et al., 2019). The absence of multicollinearity was confirmed, as variance inflation factors (VIF) remained below 5, ensuring that collinearity did not affect the results. Structural equation modeling (SEM) was used to test the proposed hypotheses. Model fit indices confirmed a good fit, with RMSEA (0.047) below the recommended 0.08 threshold and SRMR (0.038) within the acceptable range of 0.05 (Ximénez et al., 2022). The Tucker-Lewis Index (TLI = 0.934) and the Normed Fit Index (NFI = 0.921) both exceeded the 0.90 benchmark, indicating strong model fit. Path coefficients in the SEM model were all significant at $p < 0.01$, confirming the hypothesized relationships (Ximénez et al., 2022). The model's explanatory power was supported by R^2 values, with $R^2 = 0.643$ for behavioral intentions, meaning that 64.3% of the variance in behavioral intentions was explained by the model. Predictive relevance (Q^2) was assessed using PLS blindfolding, with values ranging from 0.297 to 0.461, confirming strong predictive power (Marsh et al., 2019).

4. Results

Table 3 provides an overview of the descriptive statistics and factor loadings for all measured items, offering valuable information regarding the reliability and validity of the constructs applied in this study. The mean scores (M) span from 4.812 (AR1) to 6.401 (AC2), indicating that participants generally showed moderate to strong agreement with the statements. Standard deviations (SD) range from 0.928 (AC1) to 1.189 (AR2), reflecting a reasonable degree of response variation, which falls within acceptable limits for social science research.

Table 3: Descriptive statistics and factor loadings of measurement items

Abbreviation	m	sd	α	λ
AC1	5.249	0.928	0.891	0.829
AC2	6.401	1.013	0.826	0.734
AC3	5.964	1.167	0.810	0.790
AC4	5.697	1.102	0.942	0.798
AR1	4.812	1.004	0.945	0.700
AR2	5.382	1.189	0.910	0.768
AR3	5.917	1.037	0.841	0.872
AR4	6.218	0.987	0.895	0.810
PN1	5.682	1.122	0.932	0.715
PN2	5.934	1.097	0.913	0.821
PN3	6.103	0.954	0.887	0.738
BI1	6.022	1.071	0.907	0.877
BI2	5.476	1.143	0.925	0.719
BI3	5.814	1.038	0.890	0.795
BI4	6.257	0.969	0.936	0.823

* Note: m – arithmetic mean, sd – standard deviation, α - Cronbach alpha, λ – factor loading

Source: Authors' research

Cronbach's alpha (α), used to assess internal consistency, ranges from 0.810 (AC3) to 0.945 (AR1), with all values surpassing the recommended minimum of 0.70, thereby confirming the high reliability of each construct. Notably, the alpha of 0.945 for AR1 demonstrates particularly high consistency in responses concerning personal responsibility for minimizing food waste. Factor loadings (λ) range from 0.700 (AR1) to 0.877 (BI1), all exceeding the minimum recommended 0.65, indicating that all items strongly contribute to their respective latent constructs. The lowest loading (0.700 for AR1) still meets acceptability criteria, while the highest (0.877 for BI1) suggests a particularly strong relationship between the item and its underlying construct.

Table 4 summarizes construct validity and reliability indicators based on exploratory and confirmatory factor analyses (EFA and CFA). Eigenvalues range from 4.682 (highest) to 2.317 (lowest), demonstrating that all constructs explain a substantial portion of variance. Variance explained per factor decreases logically, from 29.754% to 17.432%, with a cumulative variance of 94.372%, confirming that the model retains meaningful dimensions without excessive redundancy. All composite reliability (CR) values exceed 0.875, with the highest recorded at 0.941, indicating excellent internal consistency across the constructs. Additionally, the average variance extracted (AVE) values fall within the range of 0.564 to 0.655, surpassing the recommended minimum threshold of 0.50 and thereby confirming that the constructs demonstrate satisfactory convergent validity.

Table 4: Construct validity and reliability indicators

Factor	M	SD	α	Eigen Value	% Variance	Cumulative %	CR	AVE
AC	6.399	1.342	0.936	4.682	29.754	29.754	0.890	0.564
AR	6.244	0.966	0.943	3.894	25.647	55.401	0.904	0.655
PN	6.021	1.396	0.897	3.105	21.539	76.940	0.930	0.638
BI	6.325	1.181	0.881	2.317	17.432	94.372	0.933	0.603

*Note: m – arithmetic mean, sd – standard deviation, α – cronbach alpha, CR – composite reliability, AVE – average variance extracted
Source: Authors' research

Table 5 displays the correlation matrix for the main constructs included in the study. All correlation coefficients are positive and statistically significant, indicating the presence of meaningful associations among the variables. The strongest correlation is identified between Personal Norms (PN) and Behavioral Intentions (BI) (r = 0.841), implying that individuals who hold stronger moral beliefs regarding food waste reduction are more inclined to adopt behaviors aimed at minimizing waste. Moderate correlations are found between Ascription of Responsibility (AR) and PN (r = 0.793), as well as between Awareness of Consequences (AC) and PN (r = 0.591), suggesting that a greater awareness of the negative impacts of food waste and a stronger sense of personal responsibility are linked to more pronounced personal norms. The weakest correlation is observed between AC and BI (r = 0.463), indicating that while awareness is relevant, it may not sufficiently influence behavioral intentions without the reinforcing roles of personal responsibility and internalized moral standards.

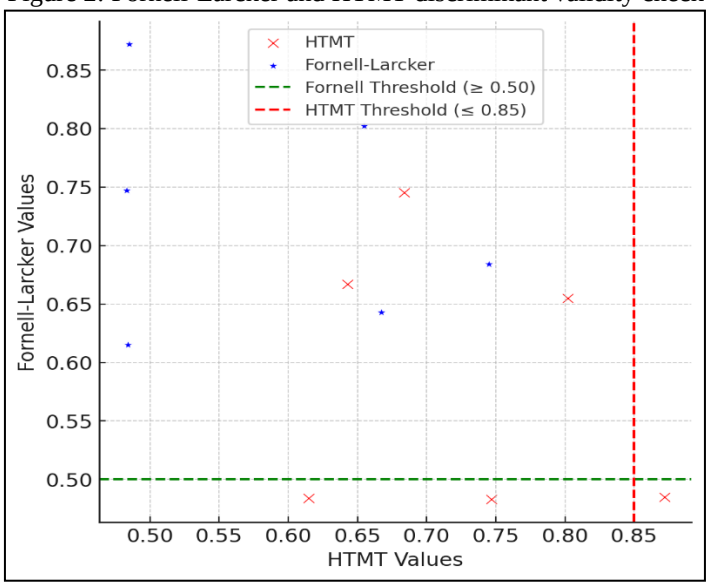
Table 5: Correlations among variables

Factor	AC	AR	PN	BI
AC	**1.000**	0.531	0.591	0.463
AR	0.480	**1.000**	0.793	0.624
PN	0.584	0.680	**1.000**	0.675
BI	0.636	0.676	0.841	**1.000**

* Note: the diagonal is the AVE square root of each construct
Source: Authors' research

Figure 2 visualizes the relationship between HTMT values (red X markers) and Fornell-Larcker values (blue star markers), providing a validity check for the constructs. The majority of HTMT values remain below the 0.85 threshold (red dashed line), confirming that constructs meet the discriminant validity criterion. Additionally, Fornell-Larcker values mostly exceed the 0.50 threshold (green dashed line), further supporting the distinctiveness of constructs. The clear separation between the two validity measures reinforces the robustness of the measurement model.

Figure 2: Fornell-Larcker and HTMT discriminant validity check



Source: Authors' research

The path analysis results validate the proposed hypotheses, confirming significant relationships among awareness of consequences (AC), the ascription of responsibility (AR), personal norms (PN), and behavioral intentions (BI) related to food waste reduction. All three hypothesized paths are statistically significant, underscoring the strength and reliability of the conceptual model. Specifically, awareness of consequences (H1) exerts a strong and significant impact on behavioral intentions, with a standardized path coefficient of $\beta = 0.703$ and a moderate effect size ($f^2 = 0.072$). This indicates that individuals with greater awareness of the environmental and social consequences of food waste are more inclined to form strong intentions to adopt waste-reducing behaviors. Similarly, the ascription of responsibility (H2) positively affects behavioral intentions ($\beta = 0.548$, $f^2 = 0.082$), indicating that when individuals feel a sense of personal responsibility, their motivation to act sustainably increases significantly. Among the predictors, personal norms (H3) exhibit both a significant path coefficient ($\beta = 0.459$) and the largest effect size ($f^2 = 0.134$), underscoring the critical role of internalized moral obligations in driving behavioral intentions. This result highlights the centrality of deeply held personal values in influencing pro-environmental behavior, particularly in the context of food waste reduction. The t-values across all paths are substantial ($t = 2.154$ to 5.349) and p-values confirm high levels of significance ($p < 0.01$ to $p < 0.001$), further reinforcing the reliability of the results (Table 6).

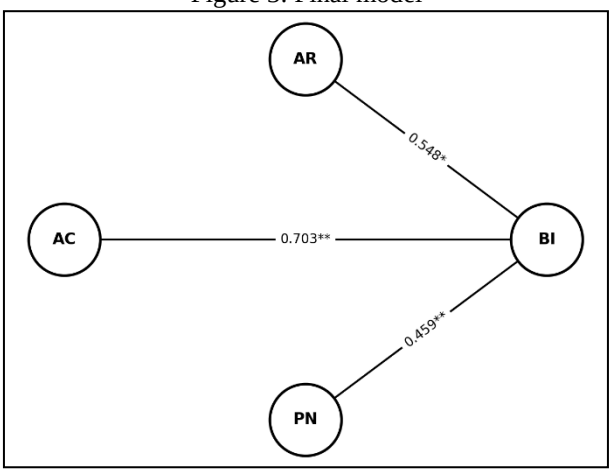
Table 6: Path analysis and hypothesis testing

Hypotheses	Path	β	m	sd	t	p	f^2	Confirmation
H1	AC → BI	0.703	6.004	1.422	2.154	<0.001	0.072	Supported
H2	AR → BI	0.548	5.348	1.399	5.349	<0.01	0.082	Supported
H3	PN → BI	0.459	6.417	1.072	3.599	<0.001	0.134	Supported

*Note: *** p < 0.001, ** p < 0.01*, *p < 0.05 (marginally significant)
Source: Authors' research

Figure 3 illustrates the relationships between the constructs Awareness of Consequences (AC), Ascription of Responsibility (AR), Personal Norms (PN), and their impact on Behavioral Intentions (BI). The strongest path (β = 0.703, p < 0.01) indicates that AC has a substantial direct effect on BI, highlighting the importance of awareness in shaping behavioral intentions. Both AR (β = 0.548, p < 0.05) and PN (β = 0.459, p < 0.01) also significantly contribute to BI, emphasizing the roles of responsibility and personal moral norms in influencing pro-environmental behaviors.

Figure 3: Final model



Source: Authors' research

5. Discussion

The results of this study confirm that psychological factors, including awareness of food waste consequences, a sense of responsibility, and personal norms, significantly influence tourists' intentions to reduce food waste in the hotel sector. These findings align with previous research applying the Norm Activation Model (NAM) in various contexts while also extending the understanding of this model within the hospitality industry. Awareness of food waste consequences emerged as the strongest predictor of tourists' intentions to reduce food waste, which is consistent with the study by Rasool et al. (2021), highlighting that awareness and perceptions of environmental consequences are key drivers of sustainable behavior. Similar results were reported by Visschers et al. (2016), where respondents with higher awareness of food waste's impact on the environment exhibited stronger intentions to reduce it. However, while awareness is a significant factor, some authors suggest that awareness alone is not sufficient to drive behavioral change. Mallinson et al. (2016) emphasize that food waste awareness often does not lead to waste reduction unless accompanied by regulatory or social incentives, suggesting avenues for further research within the hotel context. The sense of responsibility for reducing food waste also proved to

be a significant factor in shaping behavioral intentions, aligning with findings by Aguilar-Luzon et al. (2012), who confirmed that consumers who feel moral and social responsibility are more likely to adopt sustainable habits. Our findings further support those of Papaoikonomou et al. (2011), who highlight that a sense of responsibility can reduce the "intention-behavior gap" often present in environmental initiatives. However, it is important to note that in the hotel context, the sense of responsibility is often diminished due to the delegation of responsibility to hotel management (Özekici, 2022). For this reason, hotel managers play a crucial role in increasing tourists' sense of responsibility through education, promotional campaigns, and customized waste reduction strategies. Personal norms demonstrated a significant but weaker influence compared to awareness of consequences and responsibility, which aligns with the study by Teng et al. (2022), arguing that moral norms often depend on external incentives and cultural context. This finding can be further explained by Wang et al. (2021), who suggest that economic incentives and social expectations often have a stronger influence on sustainable behavior than moral norms alone. Despite this, the research by Russell et al. (2017) suggests that personal norms play a crucial role in the long-term development of sustainable habits, indicating the need for additional studies on how hotels can encourage the internalization of ecological norms among tourists.

6. Conclusion

This study offers both theoretical and empirical advancements in understanding the psychological determinants that shape tourists' intentions to reduce food waste within the hotel industry. By applying the Norm Activation Model (NAM) in this specific setting, the research confirms that awareness of consequences, perceived responsibility, and personal norms are critical predictors of sustainable behavior among tourists. The findings are consistent with existing literature on sustainability but expand the theoretical scope by contextualizing the model within the hotel sector. In doing so, the study contributes to the global discourse on food waste management by shedding light on the active role tourists can play in mitigating this issue. Unlike earlier research that primarily centered on household and restaurant contexts, this work addresses a significant gap by emphasizing the importance of the tourism industry in confronting environmental challenges related to food waste.

6.1. Theoretical and practical implications

The findings of this study have significant theoretical and practical implications. Theoretically, this research contributes to the sustainability tourism literature by confirming that the NAM model is a relevant framework for analyzing tourist behavior. However, it also highlights the need for expanding its application to the hotel sector, where responsibility and economic factors play a more prominent role than in other settings. These results suggest that the NAM model could be more effective when combined with regulatory and economic incentives, opening the possibility for its revision and adaptation to the specificities of the tourism industry. Furthermore, the study enriches the existing theoretical discourse by demonstrating how psychological factors, such as personal norms and perceived responsibility, interact with external factors like regulations and economic incentives to influence behavior. This suggests that future theoretical models could benefit from a more integrative approach that incorporates a wider range of determinants relevant to the hospitality sector.

From a practical standpoint, the findings are valuable for hoteliers, hospitality managers, and policymakers in tourism. The results emphasize the need to develop strategies that enhance food waste awareness among tourists, strengthen their sense of responsibility, and encourage moral norms through hotel practices. Effective implementation of these strategies could

involve creating educational and promotional materials that raise awareness about food waste issues and their broader environmental and economic implications. Additionally, hoteliers could improve their environmental responsibility by implementing policies that encourage tourists to minimize food waste, such as offering incentives for reduced waste or providing information about sustainable practices.

Furthermore, innovative approaches such as portion size adjustments, digital solutions to monitor and reduce waste, and guest engagement in food redistribution programs can be particularly impactful. Hotels could establish collaborations with local charities and food banks to ensure that excess food is donated rather than discarded. Digital platforms and mobile applications that track food consumption and provide feedback to guests could also serve as useful tools for promoting sustainable behaviors.

Implementing environmentally sustainable policies in the hotel sector not only contributes to food waste reduction but can also enhance the hotel reputation and attract environmentally conscious tourists. Given the growing consumer demand for sustainability, hotels that actively promote and implement food waste reduction measures may gain a competitive advantage in the market. Such initiatives can improve brand image, foster customer loyalty, and appeal to ethically-minded tourists who prioritize environmental responsibility in their travel choices.

As for researchers, this study is particularly relevant to those involved in sustainable tourism, environmental psychology, and hospitality management, who can use the findings as a foundation for further investigations. Besides this, the results offer practical value for hotel managers seeking to implement innovative food waste reduction strategies and improve the environmental responsibility of their establishments. Future research could explore the integration of psychological, economic, and regulatory factors in a comprehensive framework that provides a more holistic understanding of food waste management in the hospitality industry. Additionally, cross-cultural comparisons and longitudinal studies could offer deeper insights into how these factors influence tourist behavior across different contexts and over time.

6.2. Limitations and future research directions

While the results clearly indicate a significant impact of psychological factors on tourists' intentions, some limitations must be considered. One key limitation is the study's focus on a specific geographical context, which may restrict the generalizability of the findings to other regions or different types of hospitality establishments. Additionally, the study relies on self-reported data, which may lead to social desirability bias, meaning that respondents may overstate their commitment to sustainable behavior.

The seasonal aspect of tourist visits represents a significant limitation of this research. Namely, tourist visits to hotels in Serbia are often dependent on specific periods such as the summer season, holidays or festivals, which significantly affects the amount of food produced and consumed. During periods of high traffic, hotels often increase food production to meet demand, potentially leading to higher wastage. On the other hand, in quieter periods, the lower volume of visits may influence different food management approaches. This limitation indicates the need for a more detailed study of seasonal variations to determine whether there are significant differences in food wastage during different periods of the year. Future research could include an analysis of the impact of seasonality over a longer period of time in order to more precisely identify patterns of food wastage and develop more effective measures to reduce it.

Future research should expand these findings by incorporating longitudinal studies and observational methods to examine the relationship between intentions and actual tourist behavior. Moreover, further studies should explore how economic incentives, regulatory measures, and hotel policies can shape sustainable guest behavior, given that previous research suggests psychological factors alone are often insufficient to drive long-term change. Integrating the NAM model with the Theory of Planned Behavior (TPB) or the Value-Belief-Norm (VBN) Theory could provide a more precise understanding of the interplay between internal motivations and external factors.

Despite these limitations, the study provides clear and practical guidance for hoteliers and sustainability researchers, who can use these findings to improve sustainable practices and develop more effective food waste reduction strategies in the hotel sector.

Conflict of interest

The authors declare no conflict of interest.

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From "Experiencers" to "Souvenir buyers": Segmenting Serbian tourists based on motivations for purchasing local liqueurs while travelling

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Abstract

Purpose – The main purpose of this paper is to investigate the motivations of Serbian tourists to buy authentic local liqueurs while travelling. By analysing various intrinsic and extrinsic factors that influence these purchasing decisions, the study also attempts to identify different segments of tourists with different motivations for buying liqueurs. **Methodology** – Data from a sample of 133 buyers were analysed using hierarchical and k-means cluster analysis. Discriminant analysis was used to validate the classification, while ANOVA was used to confirm significant differences between the clusters. Pearson's chi-square test was used to compare the clusters on different characteristics, and descriptive statistical analysis was used to describe each cluster. **Results** – Three distinct segments of buyers were discovered based on their motivations for purchasing local liqueurs while travelling, namely "Experiencers", "Aesthetes" and "Souvenir buyers". Each segment is presented in terms of key motivating factors, liqueur purchase and demographic characteristics. **Implications** – The findings of this study provide valuable insights for liqueur producers and sellers, enabling them to develop targeted marketing strategies tailored to specific customer segments. Furthermore, this study represents an important step in bringing liqueurs into the wider academic discussion within tourism research, highlighting their potential to enrich tourists' cultural experiences and increase the destination's attractiveness.

Keywords: liqueurs, motivation, segmentation, Serbia
JEL classification: L66; L83

Od „iskusilaca" do „kupaca suvenira": Segmentacija srpskih turista na osnovu motivacije za kupovinu lokalnih likera tokom putovanja

Sažetak

Svrha – Glavni cilj ovog rada je da se istraži motivacija srpskih turista da kupuju autentične lokalne likere tokom putovanja. Analizom različitih unutrašnjih i spoljašnjih faktora koji utiču na ove odluke o kupovini, studija takođe pokušava da identifikuje različite segmente turista sa različitim motivima za kupovinu likera. **Metodologija** – Podaci dobijeni od uzorka

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koji čini 133 kupaca analizirani su hijerarhijskom i k-means klaster analizom. Za validaciju klasifikacije korišćena je diskriminantna analiza, dok je ANOVA korišćena za potvrdu značajnih razlika između klastera. Pirsonov hi-kvadrat test je korišćen za poređenje klastera po različitim karakteristikama, a deskriptivna statistička analiza je korišćena za opisivanje svakog klastera. **Rezultati** – Otkrivena su tri različita segmenta kupaca na osnovu njihove motivacije za kupovinu lokalnih likera tokom putovanja, a to su „iskusioci", „estete" i „kupci suvenira". Svaki segment je predstavljen u smislu ključnih motivacionih faktora, kupovine likera i demografskih karakteristika. **Implikacije** – Nalazi ove studije pružaju vredne uvide proizvođačima i prodavcima likera, omogućavajući im da razviju ciljane marketinške strategije prilagođene konkretnim segmentima kupaca. Takođe, ova studija predstavlja važan korak u uvođenju likera u širu akademsku diskusiju u okviru istraživanja turizma, naglašavajući njihov potencijal da obogate kulturna iskustva turista i povećaju atraktivnost destinacije.

Ključne reči: likeri, motivacija, segmentacija, Srbija
JEL klasifikacija: L66; L83

1. Introduction

Since ancient times, numerous alcoholic spirits have been produced by adding various materials to improve the sensory and/or health characteristics of the alcoholic bases (distillates). Depending on local customs, various fungi, plants (e.g., fruits, medicinal and aromatic herbs), and even animals (e.g., snakes, scorpions) are used as ingredients in the production of spirits (Motti et al., 2022; Veljović et al., 2019). Ethnobotanical studies, especially in European countries (Italy, Spain, etc.), have shown that mainly herbs and fruits are used as ingredients for the flavouring of spirits (Martínez-Francés et al., 2021; Motti et al., 2022). These products are considered forms of folk medicine traditionally used to prevent and treat various diseases. European heritage bears witness to the healing effects of distillates mixed with various aromatic and medicinal herbs (Egea et al., 2015).

Among herbal spirits, liqueurs are alcoholic spirits produced by adding sweeteners (sugar, honey, etc.). According to the Law on Strong Alcoholic Beverages (Official Gazette of the RS, No. 92/2015), liqueur is defined as a strong alcoholic beverage with a minimum alcohol content of 15% vol. In addition to the alcohol content, the minimum amount of sugar in liqueurs must be 100 g/L. The only exceptions are cherry liqueur, in which the ethyl alcohol comes exclusively from cherry brandy, and gentian liqueur with a minimum sugar content of 70 g/l and 80 g/l, respectively. From a sensory point of view, the chosen alcoholic bases have a considerable influence on the sensory properties. In the Balkan countries, most liqueurs are produced using double distillates made from various fermented fruits such as plums, apples, etc. The liqueurs are produced by flavouring ethyl alcohol of agricultural origin or distillates with various substances to enhance their taste and aroma. In the production of fruit liqueurs from: blackcurrant, sour cherry, raspberry, mulberry, blueberry, citrus fruits, *Rubus chamaemorus*, Arctic blackberry, American cranberry, European cranberry (*Vaccinium vitis-ideae*), seaweed and pineapple as well as herbal liqueurs from: mint, lincura, aniseed, wormwood and medicinal plants/clover, only natural flavours and flavour extracts can be used.

Liqueurs have been researched in various fields, including food science and technology (e.g., Leonarski et al., 2021), ethnobotany (e.g., Motti et al., 2022), pharmacology (e.g., Egea et al., 2015) and others. Research has primarily focused on their sensory and chemical properties as well as their potential health benefits. However, studies on liqueur consumers or purchasing behaviour remain scarce, with only a few examples from Ukraine (Bozhko,

2014) and Brazil (Pinto et al., 2017). This research gap is particularly notable in light of the increasing academic and industry recognition of local food and beverage consumption as a fundamental component of the tourism experience (e.g., Emadlou et al., 2025; Kim & Eves, 2012; Kivela & Crotts, 2006; Madaleno et al., 2017; Su et al., 2020; Vujić et al., 2024). Local food and beverages are generally defined as products that are produced in the local area, including those that use raw materials from outside the region but are processed locally to reflect a distinct regional identity (Kim et al., 2009). Beyond their nutritional function, such products have become important cultural symbols that offer tourists the opportunity to explore the identity and traditions of the places they visit (Kim & Eves, 2012).

Liqueur production aligns well with these trends. A key characteristic of liqueur production is the use of locally sourced ingredients, often collected in the wild or purchased at local markets, giving liqueurs a distinct regional identity. In addition to small local producers, monasteries also play an important role in liqueur production, relying on traditional recipes that have been passed down through generations. The integration of local liqueurs into the gastronomic tourism offer therefore has the potential to improve the cultural experience of tourists and increase the attractiveness of the destination. However, in order to effectively integrate liqueurs into the tourism offer, it is important to understand what motivates tourists to engage with such products in the first place. As Douglas et al. (2001) found in the context of wine tourism, not all tourists are drinkers or driven by product-related motives; many are also motivated by secondary motives, such as learning about local traditions, socialising, relaxing or exploring rural settings (Bruwer & Rueger-Muck, 2018, p. 490). Therefore, it is important to explore the motivations behind tourists' interest in local liqueurs to fully understand their needs, expectations and ultimately their purchase intentions. While food and beverages such as wine and beer have received considerable attention in tourism research, the specific motivations for purchasing liqueurs remain largely unexplored.

To address this gap, this study examines the motivations of Serbian tourists to purchase authentic local liqueurs when travelling. It also examines whether there are different segments of tourists who are motivated differently to buy liqueurs. Understanding these differences can support more effective targeting and positioning of liqueurs to meet the specific needs of each segment. To achieve this, the study uses cluster-based segmentation to create a detailed profile of liqueur buyers, providing insights into their unique motivations and preferences, thus providing insights that go beyond a purely academic interest and have practical relevance for market-oriented strategies.

2. Literature review

2.1. Motivation to purchase

Motivation is a fundamental psychological mechanism that influences human behavior by directing it towards the fulfillment of specific needs (Fodness, 1994). In the field of tourism, motivation is a central concept for understanding why people choose certain destinations, engage in specific activities, and consume tourism-related products and services (Crompton, 1979). To explain the drivers of tourism behavior, researchers often apply the push-pull motivation framework. This framework distinguishes between intrinsic motivations (push factors), such as the desire for escape, rest or novelty, and extrinsic motivations (pull factors), which relate to the perceived attractiveness of a destination, including its natural features, cultural offerings or recreational opportunities (Crompton, 1979; Dann, 1977; Iso-Ahola, 1982). While push factors lead people to seek out travel experiences, pull factors refer to the specific forces that "lead an individual to select one destination over another once the decision to travel has been made" (Klenosky, 2002, p. 396). In contrast to certain

perspectives that view intrinsic and extrinsic factors as completely independent of each other, Goossens (2000, p. 302) points out that in practice these factors represent "two sides of the same motivational coin", suggesting that internal forces (push factors) and external incentives (pull factors) together shape travel intentions.

Although the internal and external factors are most commonly used to understand tourists' travel behavior (e.g., Dimitrovski et al., 2021; Kim et al., 2003; Michael et al., 2017), previous studies have also applied these motivational factors to better understand what pushes and pulls consumers towards tourism products at the destination. For example, in the context of nature-based tourism, Tangeland (2011) identifies four main motives for tourists' purchasing behavior: improving the quality of the experience, acquiring new skills, exploring unfamiliar activities, and engaging in social interactions. In wine tourism, purchasing decisions are also closely linked to experiences such as wine tasting, the acquisition of wine-related knowledge and the search for unique wines (Bruwer & Rueger-Muck, 2018). Various studies have also found that tourists often purchase gastronomic products to satisfy status-related motivations. They are particularly attracted to special or unusual gastronomic products that are rare in their own culture and/or social environment. These products often serve as souvenirs that not only preserve the memory of the experience, but also help tourists express their uniqueness and gain social recognition (Crompton & McKay, 1997; Fields, 2002; Kim et al., 2009; Meng & Xu, 2012). These motivations are seen as intrinsic incentives that tourists perceive as enriching their lives (Tangeland, 2011). Purchases driven by such motivations have a high experiential value, i.e. decisions are guided not only by the functional benefits of the products (Douglas et al., 2001), but also by the expectation of sensory pleasure (Boniface, 2003), the excitement of novel and unfamiliar experiences (Otis, 1984), the satisfaction of curiosity through the acquisition of new knowledge (Kim & Eves, 2012), and the enhancement of self-esteem (Botha et al., 1999). This suggests that analyzing the specific benefits tourists expect from a product can reveal the motivations behind their purchasing behavior (Haley, 1968).

In contrast to intrinsic motivations, which are generally associated with the socio-psychological needs that individuals seek to fulfil (Yi et al., 2018), extrinsic motivations are shaped by external attributes of the destination or product such as price, quality, visual appeal and perceived effectiveness (Tangeland, 2011). In tourism, these motivations are particularly pronounced due to the short duration of the trip, the intense emotional states and the context of novelty. As a result, tourists tend to make impulse purchases, especially if the products are aesthetically appealing and culturally specific (Bruwer & Rueger-Muck, 2018; Meng & Xu, 2012). For example, Taylor et al. (2018) found that wine consumers are pulled toward wine products by the wine's origin, the grape variety, the alcohol content, sensory characteristics (such as taste and aroma) and the packaging design (such as label design, bottle shape and colour). Price, brand reputation, medals/awards and social recommendations (from family, friends, sales staff or tour guides) also play an important role in the purchase decision (Jaeger et al., 2009; Meng & Xu, 2012).

The whole process of buying tourism products can thus be understood as the result of the interaction between a perceived inner need and the knowledge of a specific product that can satisfy this need. If a person is not aware of the existence of such a product, the motivation remains implicit and unexpressed, and the purchase does not take place (Goossens, 2000). This further suggests that effectively communicating the appeal of local products may stimulate tourists' purchasing intentions when aligned with their primary motivations (Kim & Eves, 2012).

2.2. Market segmentation

Market segmentation is based on the idea that certain consumers have more in common with each other than with others. This makes it possible to divide consumers into segments based on one or more defined characteristics (Tangeland, 2011). The aim is to divide a heterogeneous market into homogeneous subgroups of consumers who differ from each other in their needs, preferences, motivations and behaviors (Park & Yoon, 2009). Traditionally, socio-demographic and geographic variables are the most commonly used methods for segmenting the tourism market, as they help define who the tourists are and where they come from (Swarbrooke & Horner, 2007; Tangeland, 2011). In addition, researchers often apply psychographic and behavioral segmentation, either independently or in combination with the other two approaches (Miragaia & Martins, 2014). Among the psychographic variables of segmentation, motivation is considered particularly important (Chen et al., 2013).

Several studies have segmented tourists according to their motivations for buying local food and beverages. Bitsani and Kavoura (2012), for example, have identified four different profiles of wine tourists: "The wine-friendly" tourists, who have a high level of knowledge and enthusiasm for wine and are primarily motivated by visiting wineries and having direct contact with producers; "The beginners", younger and less experienced visitors who want to learn more about wine and local gastronomy; "The occasional visitors" who show limited interest in wine but are attracted by broader culinary experiences; and "The tourists" or general travelers who visit wineries out of convenience rather than intention. Madaleno et al. (2017) divided food tourists into three segments: "Ambassador" consisting of mainly employed individuals seeking cultural exploration, health benefits and the excitement of trying new foods; "Enthusiast" a smaller group with a specific interest in products such as cheese and wine; and "Indifferent" for whom food is a low priority in the travel experience. Galati et al. (2023) further divided culinary tourists into "Cultural tourists" who view local food as a means of cultural immersion and are moderately motivated by a desire to support local producers and gain social prestige; "Low involved culinary tourists" with limited interest in food-related experiences; and "Social-sustainable tourists" who are strongly motivated by the goal of supporting the local economy. Similarly, a recent study of rakija buyers identified three segments based on their purchasing motivations. "Traditionalists" are often guided by past experiences and trust in local producers, preferring fruit-based rakija that is locally produced and known for its quality and good taste. "Modernists" are attracted to new and stylish products, especially those with unique bottles and modern packaging, and often opt for rakija from reputable brands or those that have received awards that they perceive as a mark of quality. "Price-limited" buyers prioritize affordability and perceived value over other product attributes (Adžić & Ratković, 2024).

3. Methodology

3.1. Sampling procedure

The focus of this study is to investigate the motivation of tourists to buy local liqueurs while travelling. In order to achieve the defined objective, a structured questionnaire consisting of three parts was used. The first part contained two questions designed to determine whether the participants were eligible for the study. This ensured that only respondents over the age of 18 who had bought local liqueurs while travelling were included in the study. Participants who had not yet reached the legal drinking age and/or had not purchased liqueurs while travelling were excluded from further analysis. The second part contained questions on purchase motivation, measured on a seven-point Likert scale from 1 ("strongly disagree") to 7 ("strongly agree"). As there is a lack of studies that specifically investigate the motives for

buying liqueurs, this study adapted statements from studies on purchase motives for other alcoholic beverages (Jaeger et al., 2009; Taylor et al., 2018). The final section included questions on liqueur consumption habits while travelling and on socio-demographic characteristics to gain a comprehensive understanding of the sample profile. As there is no publicly available data on liqueur consumers in Serbia, it was not possible to precisely define or estimate the size of the target population. Therefore, a non-probability convenience sampling method was used to recruit participants. Data collection was collected using a self-administered online questionnaire created via Google Forms. The survey link was first distributed to liqueur producers, with a request to forward it to their customers. Additionally, the questionnaire was distributed via personal contacts and posted in various Facebook interest groups dealing with tourism, gastronomy and alcoholic beverages. The data collection took place between July and September 2024 and yielded a total of 133 valid responses.

3.2. Data analysis

To identify distinct groups within the dataset, the study used a two-step method commonly applied in consumer and tourism research, which involves performing factor analysis followed by cluster analysis. This approach follows an *a posteriori* technique, meaning that the segments are not defined in advance but are instead discovered based on patterns that emerge from the data itself (Frochot & Morrison, 2000). First, a principal component analysis (PCA) was carried out on 19 items selected from the existing literature on buying motivation, using a varimax rotation to identify factors. As the purpose of this analysis was to select the best possible items for the subsequent cluster analysis, items with factor loadings below 0.50 or those loading on multiple factors were excluded, resulting in 14 items and a two-factor solution. Sampling adequacy was confirmed by the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) value and Bartlett's test of sphericity, while Cronbach's alpha values were used to confirm reliability.

The factor scores obtained from the factor analysis were used in the cluster analysis to segment the respondents based on shared characteristics, i.e. to identify segments with different motives for buying liqueurs. The sample size of 133 was considered sufficient for cluster analysis, which typically requires at least 100 observations (Hair et al., 2018). Initially, by analysing the agglomeration coefficients and dendogram obtained by hierarchical clustering using Ward's method (Hair et al., 2018), a three-cluster solution was obtained, which was then confirmed to be the best solution using k-means clustering based on Euclidean distances. Significant differences between the clusters were confirmed through analysis of variance (ANOVA), while discriminant analysis was performed to validate the clustering. The found clusters were then compared on several characteristics using the Pearson's chi-square test and descriptive statistical analysis was used to describe the individual clusters. All statistical analyses were performed using SPSS software (version 25).

4. Results

4.1. Identification of clusters

To identify the clusters, a PCA with varimax rotation was first conducted to determine factors that represent different dimensions of motivation. The value of the Kaiser-Meyer-Olkin index was 0.86, which is above the recommended value of 0.6 (Kaiser 1974) and proves that the distribution of values was suitable for conducting the factor analysis. This is also confirmed by Bartlett's test of sphericity, which reached statistical significance (p =

0.000). The factor analysis yielded a two-factor solution that explained a total of 54.31% of the variance, with 41.27 accounted for by the first component and 13.04% by the second component. Although the principal component analysis revealed the presence of three components with eigenvalues above 1, explaining 41.27%, 13.04% and 7.61% of the variance, based on Cattell's (1966) criterion, it was decided to retain two components for further investigation, after which a clear breakpoint was established in the scree plot.

Both components had many large factor weights and all variables contributed significant weights to only one component, with the intrinsic motivation items making a large contribution to component 1 and the extrinsic motivation items to component 2. The Cronbach's alpha values for the two identified components were 0.785 and 0.882, confirming that the factors were internally consistent as they were above the minimum threshold of 0.7 (DeVellis, 2012) (Table 1).

Table 1: PCA with varimax rotation of the items representing the motivational factors

Factors	Factor loading	Eigenvalue	Explained variance (%)	Cronbach's alpha
Factor 1: Intrinsic motivation		5.778	41.27	0.785
I enjoy visiting local distilleries	0.782			
I love to taste liqueurs produced in the destination I am travelling to	0.754			
I am interested in learning about the production of local liqueurs	0.727			
I like to try new and unfamiliar liqueurs when I travel	0.680			
I like to buy liqueurs as souvenirs from my travels	0.550			
Factor 2: Extrinsic motivation		1.825	13.04	0.882
Promotions and discounts	0.823			
Promotional display	0.818			
Attractive packaging and presentation	0.806			
Brand reputation	0.675			
Availability	0.639			
Awards or recognition received	0.593			
Price	0.589			
Recommendations (from locals or travel guides)	0.587			
Online reviews	0.571			

Note(s): Total explained variance = 54.31%
KMO measure of sampling adequacy = 0.86
Bartlett's test of sphericity (p = 0.000)
Source: Authors' research

In order to identify the segments of buyers, a two-stage cluster analysis procedure was carried out using the two factors identified in the previous step as input variables. Table 2 summarises the results of the means and standard deviations of the three identified clusters and shows the F-ratios obtained with ANOVA, which confirm significant differences between the identified clusters.

Table 2: Summarised statistics of three clusters and tests of equality of group means

Factors	Cluster means (SD)			*F*	*Sig.*
	Cluster 1 (n = 66)	*Cluster 2 (n = 45)*	*Cluster 3 (n = 22)*		
Factor 1: Intrinsic motivation	5.86 (0.525)	4.10 (0.814)	3.02 (1.003)	158.105	0.000**
I enjoy visiting local distilleries	6.06 (1.122)	3.69 (1.240)	2.95 (2.011)	65.165	0.000**
I love to taste liqueurs produced in the destination I am travelling to	6.03 (1.136)	4.73 (1.355)	2.55 (1.471)	63.634	0.000**
I am interested in learning about the production of local liqueurs	6.05 (1.182)	3.91 (1.379)	3.00 (2.204)	49.168	0.000**
I like to try new and unfamiliar liqueurs when I travel	5.71 (1.455)	4.38 (1.403)	2.59 (1.681)	38.960	0.000**
I like to buy liqueurs as souvenirs from my travels	5.44 (1.371)	3.78 (1.460)	4.00 (1.543)	20.680	0.000**
Factor 2: Extrinsic motivation	5.12 (0.807)	4.65 (0.620)	2.45 (1.003)	95.538	0.000**
Promotions and discounts	5.00 (1.745)	4.71 (1.392)	2.36 (1.590)	22.952	0.000**
Promotional display	4.98 (1.524)	4.18 (1.154)	2.45 (1.870)	24.470	0.000**
Attractive packaging and presentation	5.56 (1.326)	5.07 (1.250)	3.00 (1.927)	27.095	0.000**
Brand reputation	4.97 (1.467)	4.64 (1.334)	2.36 (1.432)	28.660	0.000**
Availability	5.61 (1.323)	4.71 (1.272)	2.64 (1.399)	42.034	0.000**
Awards or recognition received	4.67 (1.553)	4.29 (1.180)	2.18 (1.332)	26.400	0.000**
Price	4.56 (1.590)	4.33 (1.610)	2.50 (1.504)	14.472	0.000**
Recommendations (from locals or travel guides)	6.15 (0.949)	5.56 (0.990)	2.50 (1.263)	107.291	0.000**
Online reviews	4.56 (1.590)	4.33 (1.477)	2.09 (1.109)	23.896	0.000**

Note(s): ** The value is significant at the 0.01 level
Source: Authors' research

After conducting the cluster analysis, a discriminant analysis was performed to validate the classification of the identified clusters (Hair et al., 2018). The analysis, based on two motivational factors, yielded two canonical discriminant functions (Table 3). The results show that both functions contribute significantly to the discrimination of the groups. Function 1 ($\lambda = 0.152$, chi-square = 244.179, $p < 0.001$) was responsible for a greater degree of variation between groups than function 2 ($\lambda = 0.807$, chi-square = 27.804, $p < 0.001$).

Table 3: The summary of the discriminant results

Function	Eigenvalue	% of variance explained	Canonical correlation	Wilks' Lambda	Chi-square	df	Sig.
1	4.317	94.7	0.901	0.152	244.179	4	0.000**
2	0.239	5.3	0.440	0.807	27.804	1	0.000**

** The value is significant at the 0.01 level
Source: Authors' research

To assess the individual contributions of the variables to the discriminant functions, the structure matrix was used to estimate the relative contribution of each factor (Jaiswal et al., 2021). Table 4 shows that the Intrinsic motivation variable is strongly correlated with discriminant function 1, while the Extrinsic motivation variable was strongly correlated with discriminant function 2.

Table 4: Structure matrix

	Function 1	Function 2
Intrinsic motivation	0.733*	-0.680
Extrinsic motivation	0.549	0.836*

Note(s): * Largest absolute correlation between each variable and any discriminant function
Source: Authors' research

Finally, the discriminant analysis showed that 97% of the total sample of respondents were correctly classified, which confirms the adequate validity of the classification results (Table 5).

Table 5: Classification results

Original cluster	Predicted group membership			*Total*
	Cluster 1	***Cluster 2***	***Cluster 3***	
Cluster 1	66 (100%)	0 (0%)	0 (0%)	66 (100%)
Cluster 2	2 (4.4%)	43 (95.6%)	0 (0%)	45 (100%)
Cluster 3	0 (0%)	2 (9.1%)	20 (90.9%)	22 (100%)

Note(s): 97.0% of original grouped cases correctly classified [(66 + 43 + 20) / 133 = 97.0%]
Source: Authors' research

4.2. Cluster profiles

The demographic profile of the respondents is shown in Table 6. From the presented results, it can be concluded that women represent the majority of the sample with 57.1 percent. In terms of age, the largest percentage of participants belong to the 30 to 41 age group, accounting for 39.8 percent of the sample. Participants with a bachelor's degree form the largest group with 32.3 percent, followed by participants with a master's degree (26.3%) and a PhD (24.1%). The largest majority of respondents reported a monthly salary of more than 850 euros, while the other income levels were represented in smaller proportions. Pearson chi-square tests revealed no statistically significant differences between the clusters, suggesting that the sample is relatively homogeneous between the clusters in terms of demographic characteristics.

Table 6: Demographic characteristics of the sample

Characteristics	**Total** (N = 133)	**Clusters**			**Pearson chi-square value**	**Sig. (2-sided)**
		Cluster 1 *(n = 66)*	***Cluster 2*** *(n = 45)*	***Cluster 3*** *(n = 22)*		
Gender					0.202	0.904[ns]
Male	56 (42.1%)	28 (42.4%)	18 (40%)	10 (45.5%)		
Female	76 (57.1%)	37 (56.1%)	27 (60%)	12 (54.5%)		
Missing	1 (0.8%)	1 (1.5%)	0 (0%)	0 (0%)		
Age					7.151	0.520[ns]
18–29	32 (24.1%)	16 (24.2%)	9 (20%)	7 (31.8%)		
30–41	53 (39.8%)	26 (39.4%)	20 (44.4%)	7 (31.8%)		
42–53	38 (28.6%)	20 (30.3%)	12 (26.7%)	6 (27.3%)		
54–65	9 (6.8%)	4 (6.1%)	4 (8.9%)	1 (4.5%)		
> 65	1 (0.8%)	0 (0%)	0 (0%)	1 (4.5%)		
Education					9.544	0.481[ns]
Elementary school	1 (0.8%)	0 (0%)	0 (0%)	1 (4.5%)		
High school graduate	15 (11.3%)	6 (9.1%)	5 (11.1%)	4 (18.2%)		
Associate's degree	7 (5.3 %)	4 (6.1%)	3 (6.7%)	0 (0%)		
Bachelor's degree	43 (32.3%)	19 (28.8%)	16 (35.6%)	8 (36.4%)		
Master's degree	35 (26.3%)	18 (27.3%)	12 (26.7%)	5 (22.7%)		
PhD degree	32 (24.1%)	19 (28.8%)	9 (20%)	4 (18.2%)		
Income					8.577	0.379[ns]
Less than 250 EUR	9 (6.8%)	4 (6.1%)	1 (2.2%)	4 (18.2%)		
250–450 EUR	4 (3%)	1 (1.5%)	2 (4.4%)	1 (4.5%)		
451–650 EUR	13 (9.8%)	7 (10.6%)	3 (6.7%)	3 (13.6%)		
651–850 EUR	12 (9%)	7 (10.6%)	4 (8.9%)	1 (4.5%)		
More than 850 EUR	81 (89.5%)	41 (62.1%)	29 (64.4%)	11 (50%)		
Missing	14 (10.5%)	6 (9.1%)	6 (13.3%)	2 (9.1%)		

[ns] Non-significant
Source: Authors' research

Table 7 shows the results of consumption habits in three identified clusters. The statistical significance of the differences between the clusters was determined using the Pearson chi-square test. No significant differences were found between the clusters in terms of preferred type of liqueur ($\chi 2$ = 6.219, p = 0.623). Most consumers prefer fruit liqueurs, although preferences for other types vary slightly. Frequency of consumption differs significantly (p = 0.006), with cluster 1 consuming liqueurs more frequently than clusters 2 and 3. Preferences for place of purchase (p = 0.041) show that most consumers in all clusters prefer to buy from local producers, but cluster 1 also prefers distilleries more than the others. Spending habits (p < 0.001) show that cluster 1 tends to spend more (15–45 EUR), while clusters 2 and 3 mostly spend less than 15 EUR, with some exceptions for high-value purchases in cluster 3.

Table 7: Purchasing characteristics

	Cluster 1 (n = 66)	**Cluster 2** (n = 45)	**Cluster 3** (n = 22)	**Pearson chi-square value**	**Sig. (2-sided)**
Preferred type of liqueur				6.219	0.623[ns]
Sweet liqueur	11 (16.7%)	5 (11.1%)	7 (31.8%)		
Emulsion liqueur	1 (1.5%)	0 (0%)	0 (0%)		
Fruit liqueur	32 (48.5%)	23 (51.1%)	8 (36.4%)		
Cocktail liqueur	9 (13.6%)	7 (15.6%)	4 (8.2%)		
Bitter (herbal) liqueur	13 (19.7%)	10 (22.2%)	3 (13.6%)		
Frequency of liqueur consumption (while travelling)				17.935	0.006**
Daily	2 (3%)	1 (2,2%)	2 (9.1%)		
Several times a week	7 (10.6%)	2 (4.4%)	0 (0%)		
Occasionally	26 (39.4%)	6 (13.3%)	4 (18.2%)		
Rarely	31 (47%)	36 (80%)	16 (72.7%)		
Usual purchase location					
Local producers	50 (75.8%)	39 (86.7%)	17 (77.3%)	13.142	0.041*
Distilleries	11 (16.7%)	6 (6.7%)	0 (0%)		
Restaurants	4 (6.1%)	2 (4.4%)	2 (9.1%)		
Other (supermarkets, online)	1 (1.5%)	1 (2.2%)	3 (13.6%)		
Average spending				33.213	0.000**
Less than 15 EUR	22 (33.3%)	34 (75.6%)	17 (77.3%)		
15–45 EUR	40 (60.6%)	11 (24.4%)	3 (13.6%)		
45–95 EUR	3 (4.5%)	0 (0%)	0 (0%)		
More than 95 EUR	1 (1.5%)	0 (0%)	2 (9.1%)		

* The value is significant at the 0.05 level
** The value is significant at the 0.01 level
[ns] Non-significant
Source: Authors' research

5. Discussion of results

The analysis identified three distinct buyer segments based on their motivations for purchasing local liqueurs while travelling. Each segment is described below, highlighting the key characteristics that define it. Demographic factors are not included as previous findings did not reveal significant demographic differences between the segments.

Cluster 1: "Experiencers"

This group of buyers represents a significant proportion of the sample (49.62%) and is characterized by a strong intrinsic motivation and a pronounced appreciation of the cultural and experiential aspects of liqueurs. These buyers, who can be described as "Experiencers", are motivated by a desire to connect with local traditions and immerse themselves in authentic and meaningful travel experiences (Kim & Eves, 2012). For them, liqueur is not merely a product for consumption, but also a reflection of local culture and heritage. Their high mean scores on items such as visiting local distilleries (6.06), learning about production processes (6.05), and tasting locally made liqueurs (6.03) reflect a strong interest in exploration, discovery, and sensory engagement. This segment reflects patterns observed in earlier segmentation studies. For example, the "Ambassador" segment described by

Madaleno et al. (2017) includes tourists who are motivated by cultural exploration and want to taste unique regional products. Similarly, Galati et al. (2023) identified "Cultural tourists" who engage with local food and drink as a medium for cultural learning and experience.

While intrinsic motivations are clearly dominant, extrinsic factors also play an important role in this segment (mean = 5.12). These buyers also value recommendations from locals or tour guides (mean = 6.15) as well as the packaging and presentation of the liqueurs (mean = 5.56), indicating that external cues help enhance the perceived authenticity and appeal of the product. This supports Goossens' (2000) argument that intrinsic and extrinsic motivations are not mutually exclusive but frequently interact in shaping tourist intention. Other important extrinsic factors include availability (mean = 5.61) and promotions or discounts (mean = 5.00), indicating a certain sensitivity to the availability and price value of liqueurs. In terms of consumption preferences, this group has a strong preference for fruit liqueurs (48.5%), followed by bitter (herbal) liqueurs (19.7%) and sweet liqueurs (16.7%). Although most of this group consume liqueurs only occasionally (39.4%) or rarely (47%), they often buy them from local producers (75.8%), reflecting their focus on authenticity and cultural connection. Additionally, 60.6% reported spending between €15 and €45 per purchase, suggesting a moderate willingness to invest in products they perceive as culturally and experientially valuable.

For producers and retailers, the "Experiencers" represent a segment that is very receptive to storytelling and experiential engagement. Promoting locally produced liqueurs that are linked to the heritage of the destination would appeal strongly to this group (Kim & Eves, 2012). Strategies such as offering guided tours of the distillery, providing detailed information about the liqueur making process and designing visually appealing packaging can encourage their purchase intent. Recommendations from local experts or guides should also be emphasized in promotional activities, as they are important external decision factors for this group.

Cluster 2: "Aesthetes"

The second segment, labelled "Aesthetes" comprises 33.83% of the sample and is characterised by the respondent's appreciation for the aesthetic appeal of a product. The name of this cluster is derived from Venkatesh and Meamber's study (2008), describing aesthetes as consumers who value beauty, sensory pleasure, and emotional experiences in products, and use these aesthetic qualities to construct meaning and express identity. Consistent with this profile, this group values cultural and sensory experiences – such as tasting locally made liqueurs (mean = 4.73) and trying new or unfamiliar liqueurs (mean = 4.38) – but their decisions are even more strongly guided by external aesthetic and quality signals. In particular, they are guided by recommendations from locals or travel guides (mean = 5.56) and by packaging and presentation (mean = 5.07), indicating a preference for well-rated and visually appealing products. Availability (mean = 4.71), promotions (mean = 4.71) and brand reputation (mean = 4.64) are also important factors, suggesting that while they value the authenticity of the liqueurs, they seek confirmation of quality through external signals. Awards or recognition (mean = 4.29) and online reviews (mean = 4.33) also play a role in their decision-making process. This is in line with findings of studies on wine tourism, which emphasise the importance of visual appeal and perceived quality (Jaeger et al., 2009; Taylor et al., 2018). The motivational profile of "Aesthetes" shares similarities with the "Modernist" rakija buyers described by Adžić and Ratković (2024), who are attracted to distinctive packaging and contemporary product design.

Aesthetes' mostly prefer fruit liqueurs (51.1%), followed by bitter (herbal) liqueurs (22.2%) and cocktail liqueurs (15.6%). Consumption behaviour while travelling shows that most of them rarely consume liqueurs (80%), suggesting that they see liqueurs as a special,

occasional indulgence rather than a regular activity. When they do buy liqueurs, they prefer to buy directly from local producers (86.7%), suggesting that authenticity still plays a role, even if it is mediated through aesthetic and social filters. In terms of spending habits, "Aesthetes" are predominantly budget-conscious, with 75.6% spending less than €15 per purchase and 24.4% spending between €15 and €45. This suggests that while they value aesthetic and cultural experiences, they prefer affordability.

For producers and retailers, this segment represents a target group that is attracted to well-packaged products. Emphasising attractive, culturally inspired design and highlighting the authenticity and uniqueness of liqueurs through visual and narrative elements could effectively appeal to this group. Additionally, using local recommendations could further increase appeal to these buyers who place high trust in social validation and authenticity.

Cluster 3: "Souvenir buyers"

The smallest group in the sample (16.54%) can be described as "Souvenir buyers". Their overall intrinsic motivation is moderate (mean = 3.02), with the highest scores for the indicator "I like to buy liqueurs as souvenirs from my travels" (mean = 4.00). This suggests that while they do not necessarily want to immerse themselves in the culture or explore local traditions, they attach great importance to the symbolic value of liqueurs and often choose them as meaningful souvenirs. As Fields (2002) and Kim et al. (2009) have shown, tourists are often attracted to gastronomic products that are distinctive or unusual in their own cultural or social context, as these items allow them to stand out, communicate something new and symbolically transfer the travel experience into their everyday lives. This group has similarities with the "Indifferent" segment identified by Madaleno et al. (2017) and "Low involved culinary tourists" segment identified by Galati et al. (2023), who show little interest in gastronomic products.

Extrinsic motivation is relatively low in this group (mean = 2.45), indicating that external factors such as promotions or awards have little influence on their purchasing decisions. The highest extrinsic value was recorded for "packaging and presentation" (mean = 3.00), indicating that although these tourists are not primarily influenced by brands or discounts, they still value visually appealing or well-designed products. Other factors such as "availability" (mean = 2.64) and "price" (mean = 2.50) play a moderate role, but overall awards, recognition and online reviews (mean = 2.18 and 2.09 respectively) have a minimal influence on their preferences. This group prefers sweet and fruity liqueurs and only occasionally (18.2%) or rarely (72.7%) consume liqueurs when travelling. They predominantly buy from local producers (77.3%) and supermarkets (13.6%), with most spending less than €15 (77.3%).

To appeal to this segment, producers could highlight the sentimental qualities of liqueurs, i.e., create a connection between buyers and their travels by designing attractive packaging or offering personalized options that highlight local heritage and stories. Availability in supermarkets or other easily accessible locations could also appeal to this segment, as they are less likely to seek out distilleries.

6. Conclusion

This study has examined the motivations of Serbian tourists for buying authentic local liqueurs, filling a notable gap in the literature on tourism and consumer behavior. Through the use of factor and cluster analysis, the study identifies three distinct consumer segments, namely "Experiencers", "Aesthetes" and "Souvenir buyers", each driven by unique combinations of intrinsic and extrinsic motivations. The largest segment, "Experiencers",

value cultural authenticity and sensory exploration. "Aesthetes" are primarily influenced by visual appeal, packaging and social recommendations, while the "Souvenir buyers" focus more on the symbolic value and memorability of the liqueurs.

The main contribution of this paper lies in its exploratory nature, focusing on a sample of liqueur buyers. To the best of the authors' knowledge, liqueurs and in particular liqueur buyers have not previously been the subject of research in the field of tourism. This paper represents a first attempt to explore the buying motives and introduce liqueurs as a relatively neglected product in the Republic of Serbia into the scientific discourse in the field of tourism. Moreover, the study has practical implications, particularly for small local producers and distilleries, providing guidance on developing marketing strategies tailored to individual customer segments.

The study is not without limitations. The main shortcomings are related to the sample size and the limited number of statements that were used to investigate the purchase motives. Future research should aim to increase the sample size and expand the number of motivational factors considered in order to confirm or identify a more diverse classification of buyers that may not have been captured in this study. Additionally, although motivational segmentation provided important insights, future research could benefit from more comprehensive segmentation approaches that integrate socio-demographic, geographic, behavioural, and other psychographic variables. Furthermore, as this study was conducted in the Serbian market, the findings cannot be generalised to other markets. Future studies should therefore aim to include other geographical contexts to improve the applicability of the results.

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Conflict of interest

The authors declare no conflict of interest.

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The mediating effect of artificial intelligence marketing strategy on the relationship between value co-creation and business performance of travel agencies

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Abstract

Purpose - This study delves into the relationship between value co-creation and business performance in travel agencies. Furthermore, the study examines the mediating role of artificial intelligence (AI) marketing strategies in travel agencies. **Methodology** – The study used questionnaires to collect primary data from the respondents, which were subsequently analyzed using the Smart-PLS software. Data collection focused on individuals employed in travel agencies within the Republic of Serbia, aiming to empirically test the study's hypotheses. **Findings** – The findings highlight the importance of value co-creation in achieving superior business performance. They also suggest that implementing artificial intelligence marketing strategies positively correlates with the business performance of travel agencies in the Republic of Serbia. Finally, the findings illustrate a significantly positive relationship between AI-based marketing strategies, value co-creation, and business performance of travel agencies in the Republic of Serbia. **Implications** – Artificial intelligence has become a key topic for tourism organizations. A marketing strategy based on artificial intelligence, combined with feedback from service users, is likely to enhance the performance of service organizations.

Keywords: travel agency, co-creators, marketing strategies, business performance, artificial intelligence
JEL classification: L83, M31, O33

Posrednički efekat marketinške strategije veštačke inteligencije na odnos između ko-kreacije vrednosti i poslovnih performansi turističkih agencija

Sažetak

Svrha – Ova studija istražuje odnos između ko-kreacije vrednosti i poslovnih performansi u turističkim agencijama. Takođe, proučava posredničku ulogu marketinških strategija zasnovanih na veštačkoj inteligenciji u turističkim agencijama. **Metodologija** – U ovoj studiji korišćeni su upitnici za prikupljanje primarnih podataka od ispitanika, a podaci su

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analizirani koristeći Smart-PLS softver. Podaci su prikupljeni od zaposlenih u turističkim agencijama Republike Srbije s ciljem empirijskog testiranja hipoteza ove studije. **Rezultati** – Rezultati naglašavaju značaj ko-kreacije vrednosti u postizanju superiornih poslovnih performansi. Takođe sugerišu da implementacija marketinških strategija zasnovanih na veštačkoj inteligenciji pozitivno korelira sa poslovnim performansama turističkih agencija u Republici Srbiji. Na kraju, nalazi pokazuju značajnu pozitivnu povezanost između marketinških strategija zasnovanih na veštačkoj inteligenciji, ko-kreacije vrednosti i poslovnih performansi turističkih agencija u Republici Srbiji. **Implikacije** – Veštačka inteligencija je postala ključna tema za turističke organizacije. Marketinška strategija zasnovana na veštačkoj inteligenciji, oblikovana povratnim informacijama od korisnika usluga, verovatno će poboljšati poslovne performanse uslužnih organizacija.

Ključne reči: turističke agencije, ko-kreatori, marketing strategija, poslovne performanse, veštačka inteligencija
JEL klasifikacija: L83, M31, O33

1. Introduction

Tourists, guests and users are considered to be partially engaged in service organizations. Both the service provider and the user contribute to creating a value through the experience of simultaneous production and service consumption. This process is known as co-creation. Service users are the creators of a value they create through their own experience. Co-creation also provides feedback on users' needs and preferences that can improve future service encounters (Bove et al., 2009; Liu & Tsaur, 2014; Ranjan & Read, 2016; Vargo & Lusch, 2008). The emergence of new technologies alongside the swift progress of artificial intelligence (AI) in recent times has spurred the creation of diverse tools aimed at streamlining the process of value co-creation (Enholm et al., 2022; Lacarcel, 2022; Lalicic & Weismayer, 2021; Thamik, & Wu, 2022; Toorajipour et al., 2021; Tung et al., 2017). AI applications, such as chatbots, adopt a personalized approach in the co-creation process. These tools create innovative ways to interact with users, open new channels for engagement, and provide opportunities to deliver value tailored to users' lifestyles. Value co-creation stems from interactions facilitated by AI-enabled services like chatbots. According to Lalicic and Weismayer (2021), while saving time and effort are key benefits of these tools, little is known about how they influence consumers' perceptions of service processes. Interestingly, consumers with higher resistance to change may still adopt new technologies, as suggested by Lalicic and Weismayer (2021). Organizations can harness the potential of AI to extrapolate meaningful insights from data, facilitating the formulation of sophisticated marketing strategies grounded in empirical evidence and predictive analytics. According to Al-Surmi et al. (2020), Cacciolatti and Lee (2016), Haleem et al. (2022), Verma et al. (2021), Vlačić et al. (2021), the implementation of AI in an organization's marketing strategy facilitates user targeting, personalization of experiences, and the identification of user expectations, leveraging insights derived from collected data. Delivering a unique and memorable user experience in which the users actively participate in value creation is pivotal for bolstering competitiveness within the tourism sector. This paper aims to examine the correlation between user experience in utilizing services offered by Serbian travel agencies and the business performance of these agencies, with a particular emphasis on the role of AI-driven marketing strategies. The research aims to investigate the relationship between value co-creation and the business performance of travel agencies, as well as the mediating effect of AI-based marketing strategies on this relationship. The objective of this research is to examine the way that value co-creation impacts the business performance of travel agencies, as well as to explore the role that AI marketing strategies have in this relationship.

This study is structured into four main sections. The first section provides a theoretical overview of the variables under investigation and a review of relevant findings from prior research. The second section describes the research methodology, including details on the questionnaire design, the data collection period, and the sample composition, which is informed by a forthcoming study. The third section presents the results of the PLS-SEM analysis, performed using SmartPLS software, and offers a comprehensive discussion of the findings. Finally, the concluding section summarizes the key insights of the study and outlines potential directions for future research.

2. Theoretical background

2.1. Value co-creation, AI marketing strategy and business performance

Marketing strategy refers to marketing activities and decisions related to creating and maintaining a competitive advantage, focusing on ways in which the customer experience can be effectively differentiated from competitors. A customer-oriented marketing strategy aims to integrate customer preferences into product/service development (Voss & Voss, 2000), encouraging future-oriented business and long-term business success as opposed to short-term profit (AI-Surmi et al., 2020).

Marketing strategies can be developed by analyzing various parameters, such as user needs, matching products/services with user requirements, user availability etc. (Giri et al., 2019). Artificial intelligence collects the information, processes and updates it without additional programming or human intervention, which facilitates the prediction of future problems (Huang & Rust, 2022). In this context, AI-based marketing refers to the utilization of advanced tools and technologies that design and implement marketing strategies and actions aimed at optimizing outcomes. These tools leverage data on users, competitors, and organizations to inform decision-making and enhance marketing effectiveness (Giri et al., 2019; Overgoor et al., 2019; Vlačić et al., 2021).

AI can be utilized in various marketing strategies (Davenport & Kalakota, 2019). The three primary areas in which AI can be applied are data-driven marketing, personalized marketing, and multi-channel marketing (Davenport & Kalakota, 2019; Peyravi et al., 2020). AI empowers organizations by converting vast data into actionable insights, facilitating the creation of superior marketing and sales strategies. This frequently results in a sustainable competitive edge (Paschen et al., 2020). As the authors point out (Haleem et al., 2022), marketers use AI to increase user demand.

Haleem et al. (2022) state that users experience positive interactions through integrated applications utilizing AI. Modern travelers increasingly rely on digital tools and platforms to inform their decisions, utilizing online reviews and social media feedback. Artificial intelligence plays a pivotal role in this process through techniques such as search engine optimization, email marketing, programmatic advertising, and influencer marketing, enabling the delivery of personalized recommendations for destinations, activities, and accommodations tailored to individual preferences (Lacarcel, 2022). Furthermore, AI leverages data on users' past travel histories, preferences, and social media interests to craft customized messages, generate detailed descriptions of destinations and hotel properties, create virtual tours, facilitate flight bookings, and provide comprehensive information on tourist attractions (Trifunović et al., 2024). AI is so seamlessly integrated that users often do not realize they are engaging with the technology (Kumar et al., 2019). Vlačić et al. (2021) highlight how AI can enhance performance in areas such as efficiency, competitive advantage, sales forecasting, sales performance, and customer value creation. According to

Peyravi et al. (2020), AI has the potential to boost the productivity, effectiveness, and development of an organization's marketing strategy.

2.2. Relationship between value co-creation, AI-based marketing strategy and business performance

This section delves into the theoretical overview of prior research concerning the effects of value co-creation on the business performance of travel agencies, alongside the AI-based marketing strategy investigated by different authors. Additionally, it examines the mediating role of AI-based marketing strategy in the correlation between value co-creation and the business performance of travel agencies. Subsequently, a hypothesis is formulated based on the analysis of insights available in the existing literature. This hypothesis is further scrutinized through the utilization of SmartPLS software and PLS-SEM analysis.

2.2.1. Relationship between value co-creation and AI-based marketing strategy

According to Wu and Monfort (2023), the incorporation of AI in organizations yields noticeable effects, especially regarding relations with the existing and loyal users.

The results of the author's research (Peyravi et al., 2020) have confirmed that information about users and their service experiences can lead to the personalization of users and a more accurate targeting through AI-based marketing strategy. AI-based marketing strategies encompass various approaches to the marketing mix, developed on the basis of the insights derived from AI tools. These strategies are designed to attract new users and retain the existing customers by leveraging data-driven personalization and targeted engagement (Enholm et al., 2022).

From a technology-based perspective, the authors suggest that AI-based marketing strategies enable companies to collaborate more effectively and efficiently with consumers. Moreover, they facilitate utilizing consumer information in development to bring forth more favorable consumer responses when they show intent to communicate and co-create value with consumers (Wang & Kim, 2017).

According to Bughin et al. (2017), technological development impacts on the consumer and the way marketing strategies are formed, too. AI-based marketing strategies use information generated during the creation of consumer value (Peyravi et al., 2020). Moreover, AI tools assist tourists in accessing relevant information, enhancing their decision-making processes and overall user experience (Enholm et al., 2022). For instance, algorithms analyze visitor activity on travel agency websites and social networks to generate personalized offers, thereby improving the quality of the user experience.

According to Peyravi et al. (2020), marketing has undergone significant transformations in recent years due to the emergence of various tools aimed at comprehending user behavior. This is how AI research opportunities integrated into the marketing strategy are associated with a different user behavior while using a service (Davenport et al., 2020). Thus, an AI-based marketing strategy could help create a better user experience with the help of user experience information. According to Giri et al. (2019), organizations should plan their marketing strategies as to meet the daily demand for their services.

Based on the above, the first research hypothesis is:

H1: Value co-creation is positively related to an AI-based marketing strategy.

2.2.2. Relationship between AI-based marketing strategy and business performance of travel agency

According to Rehman et al. (2019) as well as Wu and Monfort (2023), concerning internal organizational factors like operational, financial, or marketing factors, the marketing strategy stands out as being the essential factor. A company's marketing strategy encompasses various strategies, including the marketing mix. Furthermore, it has been noted that marketing capabilities also have an impact on organizational performance.

Previous studies have indicated a positive correlation between AI and organizational performance (Basri, 2020; Petrella et al., 2021). According to Ivanova (2019), the integration of AI is crucial for the competitiveness of travel agencies nowadays. The future includes full automation and integration of AI, alongside with the challenges such as regulation, data protection, security, technical compatibility and ethical issues (Ivanova, 2019). According to Kırtıl and Aşkun (2021), AI can significantly improve tourism revenue, increasing the efficiency of data analysis, demand predictions and personalized recommendations. AI can enhance this process by enabling personalized recommendations and interactions, which can increase tourist engagement and satisfaction (Kırtıl & Aşkun, 2021). According to Doborjeh et al. (2022), utilization of advanced AI technologies improves tourist experiences and enhances marketing and management strategies in travel agencies. According to Lacarcel (2022), AI-based strategies aimed at enhancing user experience include virtual reality (VR), chatbots, and self-service devices. VR utilizes computer technology to simulate environments, providing users with an immersive experience. Chatbots are software programs designed to mimic human conversation, enabling natural and interactive communication. Self-service devices allow users to independently perform services through dedicated software, streamlining the user experience. According to Koo et al. (2021), AI that provides personalized and contextualized information and services is used to improve customer experience as well as efficiency in tourism organizations.

According to Wu and Monfort (2023), marketing strategies have a comprehensive impact on all facets of an organization. The primary objective of organizations is profitability. The ultimate aim of marketing strategies is to attract users, who are the lifeblood of an organization. Studies by Al-Surmi et al. (2019), Al-Surmi et al. (2020) and Teeratansirikool et al. (2013) confirm a positive relationship between marketing strategies and organizational performance. Wu and Monfort (2023) further assert that the adoption of effective marketing strategies enhances organizational processes, which leads to increased performance levels.

Studies by Davenport and Kirby (2016) highlight the positive impact on organizational performance upon adopting AI-based marketing strategies. Applying AI-based marketing strategies can improve performance, since innovation drives the increase in the number of a company's service users (Santos-Vijande et al., 2022; Wu & Monfort 2023).

According to Shiratina et al. (2023), both AI and marketing strategies have emerged as significant factors for enhancing business capabilities, consequently leading to an improved business performance. The findings of the authors' research (Shiratina et al., 2023) show that AI-based marketing strategies are positively related to the organizational performance within the tourism sector. To fully harness the benefits of AI, it must be integrated into a cohesive strategy (Enholm et al., 2022). The effective implementation of AI applications within such a strategy can maximize potential advantages while addressing associated risks.

Previous studies have consistently highlighted a positive relationship between AI and organizational performance (Davenport, & Ronanki, 2018; Petrella et al., 2021; Shiratina et al., 2023). Thus, the previous findings show that employing AI improves the organizational process, which eventually results in better performance (Shiratina et al., 2023). According to

Enholm et al. (2022), the advantages of applying AI-based marketing strategies refer to improved marketing accuracy with a more precise user distribution. Users' experience may enhance thanks to more personalized solutions suggested by AI.

Based on the previous points, the second research hypothesis is:

H2: The AI marketing strategy is positively related to business performance.

2.2.3. Relationship between value co-creation and business performance of travel agencies

The co-creation of value recognizes the active role of tourists, shifting the focus from traditional models that considered value solely as a product of the service provider. This concept emphasizes cooperation and interaction in the value creation process (John & Supramaniam, 2024). Not only does value co-creation contribute to value creation, but it is also the key to sustainable growth of travel agencies' business. Co-creation in tourism is particularly important because tourism sells experiences, not plain products. The growing use of social networks and information technology has changed the way co-creation takes place. Moving from physical interactions to virtual ones has allowed users to better connect with each other (Mohammadi et al., 2021). According to Tran and Vu (2021), user-based performance and user-perceived value are the units for measuring value co-creation effects.

AI plays a significant role in personalizing customer experiences, enabling customized recommendations and service optimization. By using data analytics, travel agencies can improve customer interaction. AI also enables the creation of virtual and augmented realities, which enrich the traveler's experience. A significant challenge lies in user acceptance of these technologies, as some individuals may feel discomfort or demonstrate a preference for traditional, human-provided services (García-Madurga & Grilló-Méndez, 2023). Nonetheless, advancements in AI and automation, as noted by Solakis et al. (2024), facilitate a collaborative process that enables travel agencies to better understand and address user needs. However, the implementation of AI and automation may introduce emotional and psychological barriers for users, as traditional travel agency services have historically relied on personal interactions. According to Koo et al. (2021), AI providing personalized and contextualized information and services is used to improve customer experience and efficiency in tourism organizations.

Previous studies considered that the values created from the co-creation process include values for customers and values for companies (Mustak et al., 2013). The link between user contribution in the joint value creation process and organizational performance has been affirmed in a research paper by Tran and Vu (2021). Numerous studies have explored the connection between consumer value co-creation, perceived value, and subsequently, organizational performance. Tran and Vu (2021) have confirmed that consumer satisfaction and loyalty result from consumers' active participation in the value co-creation processes.

Based on the previous points, the third hypothesis for this research is:

H3: Value co-creation is positively related to business performance.

2.2.4. The mediating role of AI-based marketing strategy in the relationship between value co–creation and business performance

A high level of user engagement in AI tools can help organizations utilize interactive features to create a finer organizational image, superior user experience and more repeated purchases more efficiently. According to Haleem et al. (2022), AI applications in digital marketing deliver valuable personalized content tailored to diverse user profiles. These

applications include personalized websites, targeted email campaigns, facial recognition software integrated with smart notifications, social media content, videos, and real-time welcome messages. Therefore, customer engagement is the key factor which affects loyalty and, ultimately, organizational performance (Vlačić et al., 2021; Wang & Kim, 2017).
The primary hypothesis, formulated to be tested and validated, is stated as follows:

H4: The AI marketing strategy has a positive mediation effect in the relationship between value co-creation and business performance.

3. Materials and methods

This section sets forth the methods used to gather data from respondents, the way the respondents answered the questions, and data collection timeframe. It also presents and analyzes the research findings.

3.1. The questionnaire

The current study investigates the way value co-creation impacts business performance and examines the mediating role of AI-based marketing strategies of travel agencies employees in Serbia. The study uses a two-part Google Form questionnaire to collect the primary data from the respondents. The first part comprises control questions, such as the ones regarding the respondents' gender, age, level of education, work experience, travel agency's length of operation and the number of its employees. The second part refers exclusively to the evaluation of value co-creation as independent variables, and to AI-based marketing strategies and business performance of travel agencies as dependent variables. The statements in the questionnaire originate in research by Wu and Monfort (2023) and Sampe (2012). Research and measurement employ the Likert scale, ranging from 1 (strongly disagree), 2 (disagree), 3 (undecided), 4 (agree) to 5 (strongly agree) (Joshi et al., 2015).

3.2. Sample characteristics

All respondents were employed in travel agencies. The respondents were selected through a simple random sampling method, with the addresses of travel agencies obtained from the official database of YUTA members (yuta.rs). The survey encompassed travel agencies from multiple cities across the Republic of Serbia. To facilitate participation, each agency received the questionnaire accompanied by detailed instructions on completion and guidelines for distributing it to all employees, regardless of their job position. While a total of 500 surveys were distributed to selected participants, only 320 were returned and subsequently included in the analysis, resulting in a response rate of approximately 64%. The data were then analyzed using SPSS IBM statistical software and SmartPLS 3 to test discriminant and convergent validity, as well as to investigate the relationships between the selected constructs. Given the research objectives, hypothesis testing, and the research model, this study employed Partial Least Squares Structural Equation Modeling (PLS-SEM).

Data collection took place from April 2023 to June 2023. Table 1 illustrates the composition of the sample concerning gender, age, level of education, work experience, the duration of the travel agency's operation, and the number of employees. The majority of the sample comprised female respondents (64%), predominantly aged between 41 to 50 years of age (50%), holding a bachelor's degree (65.6%), occupying professional positions within their organizations (58%), possessing between 8 and 11 years of work experience in travel agencies (40%), working in travel agencies established for approximately 11 to 15 years (25%), and employed by travel agencies with approximately 11 to 15 employees (18%).

Table 1: Sample characteristics

Sample characteristics	Number of respondents	Percentage (%)
Gender		
Male	117	36.6
Female	203	63.4
Age structure		
Less than 30	65	20.3
31 – 40	66	20.6
41 – 50	160	50.0
More than 50	29	9.1
Level of education		
Elementary school	1	0.3
High school	31	9.7
Three years of vocational education	55	17.2
Bachelor's Degree	210	65.6
Specialist Studies	8	2.5
Master of Vocational Education	3	0.9
Master of Arts/Science in Academic Studies	12	3.8
Work experience in an agency		
Less than 3	65	20.3
4-7	95	29.7
8-11	127	39.7
More than 12	33	10.3
Agency's length of operation		
Less than 5 years	39	12.2
6-10	43	13.4
11-15	79	24.7
16-20	76	23.8
21-25	45	14.1
26-30	26	8.1
31-35	12	3.8
Agency's number of employees		
Less than 5 employees	52	16.3
6-10	52	16.3
11-15	58	18.1
16-20	48	15.0
21-25	28	8.8
26-30	22	6.9
31-35	28	8.8
36-40	20	6.3
More than 40 employees	12	3.8

Source: Authors' research

4. Results and discussion

We used the SPSS IBM statistical software and Smart PLS 3 to present the research findings. According to Becker et al. (2023) PLS-SEM is a method designed to analyze intricate interrelationships between constructs and indicators. During our research, we PLS-SEM to assess the proposed model. The study comprises two sets of linear equations: the measurement model, which delineates the relationship between constructs and their observed indicators (specifically, value co-creation on AI and business performance of travel agencies, along with the mediating role of AI marketing strategy on the relationship between value co-creation and business performance of travel agencies). Our analysis began with the examination of the measurement model, which was followed by the structural model. Descriptive statistics for each of the observed variables are shown in Table 2.

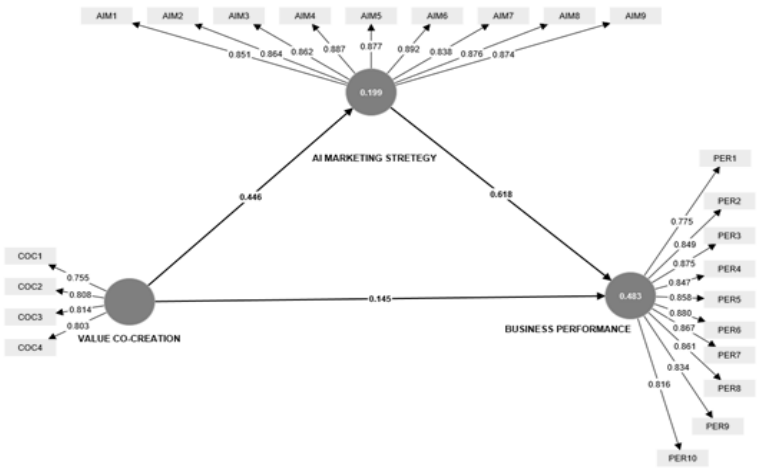
Table 2: Descriptive statistics for observed variables

	N	Minimum	Maximum	Mean	Std. Deviation
Value co-creation	320	2.75	5.00	4.532	0.49759
AI-based marketing strategy	320	2.00	5.00	4.312	0.70143
Business performance	320	2.00	5.00	4.317	0.69738

Source: Authors' research

Table 3 shows the external loadings of the indicators for each variable in the model under consideration. As per the guidelines proposed by Hair et al. (2019) and Haji-Othman and Yusuff (2022) indicators loadings should ideally be above 0.708. Conversely, indicators falling within the range of 0.4 to 0.7 are suggested for retention in the model, depending upon the condition that other indicators have not been eliminated. It should be noted that all indicators in the model meet the specified criteria.

Figure 1: Path coefficient estimates



Source: Authors' research

Table 3: Reflective indicator loadings

	Value co-creation	AI-based marketing strategy	Business performance
Value co-creation			
Our clients participate in the service provision.	0.755		
Our clients share their service experience with us.	0.808		
All employees are familiar with the agency's long-term plans regarding service provision.	0.814		
The travel agency I work in deals with problems that arise from relations with service users.	0.803		
AI-based marketing strategy			
The travel agency I work in employs business markets' segmentation, positioning and targeting.		0.851	
The travel agency I work in deals with public relations management.		0.864	
The travel agency I work in monitors all communication channels as to maintain relations with service users.		0.862	
The travel agency I work in monitors the service users' decision-making process.		0.887	
The travel agency I work in has a clearly defined pricing strategy.		0.877	
The travel agency I work in monitors the service users' decision-making process.		0.892	
The travel agency I work in conducts marketing research.		0.838	
The travel agency I work in maintains interaction with the service users.		0.876	
The travel agency I work in receives feedback from the service users.		0.874	
Business performance			
The travel agency I work in has more employees than last year.			0.775
The travel agency I work in has a larger market share than last year.			0.849
The travel agency I work in has sold more travel holidays in comparison to this time last year.			0.875
The travel agency I work in meets its goals in terms of performance.			0.847
I am happy to be working in this travel agency.			0.858
I believe that the future of this travel agency is safe.			0.880
I believe that users are satisfied with the services we provide.			0.867
The travel agency I work in has a favorably defined strategy for its position in the future.			0.861
There is a continuous improvement of the travel agency I work in.			0.834
I believe that the travel agency I work in is successful.			0.816

Source: Authors' research

Table 4 shows the metrics for reliability and convergent validity which were assessed using Cronbach's alpha, composite reliability, and average variance extracted (AVE). Dunn et al. (2014), Jevtić and Gašić (2024), Peterson and Kim (2013), Sijtsma (2009) and Zumbo et al. (2007) recommend a threshold value of 0.6 for Cronbach's alpha. In this study, all constructs demonstrate convergent validity with Cronbach's alpha values exceeding 0.60. Henseler et al. (2015) recommend a threshold value of 0.70 for composite reliability. Our findings show composite reliability values ranging from 0.87 to 0.97 for each construct, which meets this standard. Furthermore, the AVE values exceed 0.50, in accordance with the guidelines provided by Hair Jr et al. (2020) and Jevtić and Gašić (2024).

Table 4: Internal consistency and convergent validity

	Cronbach's alpha		**Composite reliability**		**AVE**	
	Values	**Criterion**	**Values**	**Criterion**	**Value**	**Criterion**
AI-based marketing strategy	0.960	**>0.6** (Jevtić & Gašić, 2024)	0.965	**>0.7** (Henseler et al., 2015)	0.756	**> 0.5** (Jevtić & Gašić, 2024)
Business performance	0.956		0.962		0.717	
Value co-creation	0.808		0.873		0.633	

Source: Authors' research

Henseler et al. (2015) and Hair Jr et al. (2020) suggest that discriminant validity can be assessed using cross-loadings, the Fornell-Larcker criteria, and the heterotrait-monotrait (HTMT) ratio. Table 5 shows the analysis of cross-loadings, which evaluates discriminant validity at the indicator level. Discriminant validity is considered to be adequate if each indicator of a given construct has weak correlations with indicators of other constructs, meaning the loading of each indicator is higher than any cross-loading. A review of the table reveals that the loading of each indicator is greater than any other construct in the same column or row, confirming appropriate discriminant validity in the model.

Table 5: Discriminant validity – Cross-loadings

	Value co-creation	**AI-based marketing strategy**	**Business performance**
COC1	0.755	0.304	0.306
COC2	0.808	0.314	0.290
COC3	0.814	0.335	0.340
COC4	0.803	0.439	0.385
AIM1	0.426	0.851	0.591
AIM2	0.367	0.864	0.525
AIM3	0.379	0.862	0.584
AIM4	0.422	0.887	0.606
AIM5	0.388	0.877	0.588
AIM6	0.368	0.892	0.600
AIM7	0.389	0.838	0.627
AIM8	0.374	0.876	0.576
AIM9	0.369	0.874	0.634
PER1	0.380	0.655	0.775
PER2	0.386	0.621	0.849

PER3	0.362	0.581	0.875
PER4	0.332	0.573	0.847
PER5	0.350	0.626	0.858
PER6	0.338	0.608	0.880
PER7	0.379	0.555	0.867
PER8	0.387	0.530	0.861
PER9	0.310	0.477	0.834
PER10	0.319	0.505	0.816

Source: Authors' research

At the indicator level, Henseler et al., (2015) propose that discriminant validity is confirmed when the AVE for each construct exceeds the squared correlations with other constructs. Rigdon et al. (2017) state that the Fornell-Larcker criterion is satisfied if the variance extracted for each construct surpasses its squared correlation with other constructs. The analysis of Table 6 indicates that discriminant validity was achieved according to the Fornell-Larcker criterion.

Table 6: Discriminant validity – Fornell – Larcker criterion

	AI-based marketing strategy	**Business performance**	**Value co-creation**
AI-based marketing strategy	0.869		
Business performance	0.683	0.847	
Value co-creation	0.446	0.421	0.795

Source: Authors' research

Table 7 presents the HTMT (heterotrait-monotrait) approach, which is recognized as a reliable method for evaluating discriminant validity and the most precise indicator in this context. The commonly employed threshold value is 0.90 (Hair Jr et al., 2020; Henseler et al., 2015). Since all values in Table 7 are below 0.90, it suggests that discriminant validity has been successfully established based on this criterion.

Table 7: Discriminant validity - Heterotrait-monotrait – HTMT

	AI-based marketing strategy	**Business performance**	**Value co-creation**
AI-based marketing strategy			
Business performance	0.705		
Value co-creation	0.495	0.470	

Source: Authors' research

The results presented in Table 8 depict a multicollinearity analysis where most of the VIF (Variance Inflation Factor) values exceed 3. The commonly used threshold value for VIF is 3 (Hair et al., 2019). However, according to Henseler et al. (2015) and Rigdon et al. (2017), the threshold is set at 5. In the observed model, there are instances such as AIM1, AIM2, AIM3, AIM4, AIM5, AIM6, AIM8, AIM9, PER2, PER3, PER4, PER5, PER6, PER7, PER8, PER9, and PER10, where VIF values exceed 3, but are below 5. We may conclude that multicollinearity exists, but it does not affect the model substantially. Based on the research of authors who accept VIF values of 5, these values are held to be acceptable.

Table 8: Multicollinearity testing of indicators – VIF

	VIF
COC1	1.573
COC2	1.818
COC3	1.817
COC4	1.534
AIM1	3.324
AIM2	3.498
AIM3	3.332
AIM4	4.178
AIM5	3.758
AIM6	4.075
AIM7	2.982
AIM8	3.959
AIM9	3.845
PER1	2.703
PER2	3.691
PER3	4.280
PER4	3.338
PER5	3.773
PER6	4.690
PER7	4.088
PER8	3.906
PER9	3.711
PER10	3.166

Source: Authors' research

The R-squared value suggests that approximately 48.3% of variations in business performance can be justified by co-creation, while the remaining 51.7% is under the influence of factors yet to be investigated. Moreover, co-creation initiatives contribute to approximately 19.9% of the changes observed in AI-based marketing strategy.

Table 9: Coefficients of determination of the construct

	R-square	**R-square adjusted**
AI-based marketing strategy	0.199	0.196
Business performance	0.483	0.480

Source: Authors' research

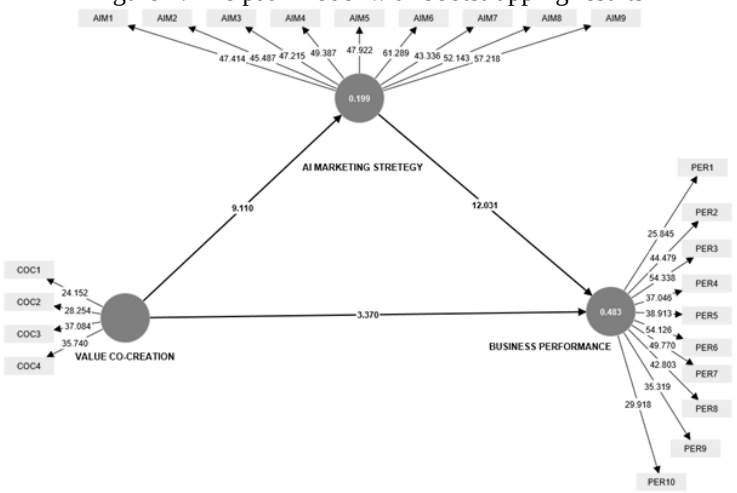
Table 10: Statistical significance testing - direct and specific (mediator) indirect effect

	Original sample (β)	**St. deviation**	**T statistics**	**p-values**
AI-based marketing strategy → Business performance	0.618	0.051	12.031	0.000
Value co-creation → AI-based marketing strategy	0.446	0.049	9.110	0.000
Value co-creation → Business performance	0.145	0.043	3.370	0.001
Value co-creation → AI-based marketing strategy → Business performance	0.000	0.033	8.322	0.000

Source: Authors' research

Based on the findings depicted in Table 10, we infer the following:
1 - There is a significant and positive correlation between AI-based marketing strategy and business performance (β=0.618, T=12.031, p=0.000).
2 – There is a significant and positive correlation between value co-creation and AI-based marketing strategy (β=0.446, T=9.110, p=0.000).
3 - There is a significant and positive correlation between value co-creation and business performance (β=0.145, T=3.370, p=0.001).
4 - Concerning the mediating effect of AI-based marketing strategy in the relation between value co-creation and business performance, the indirect impact of value co-creation on business performance via AI-based marketing strategy is both positive and statistically significant (β=0.276, T=8.322, p=0.000), and indicates mediation.

Figure 2: The path model with bootstrapping results



Source: Authors' research

5. Conclusion

Based on the literature review and research conducted, the introduction of AI can contribute to the business performance of travel agencies through increased productivity, better user experience, cost optimization, increased sales, better decision making and competitive advantage. With the introduction of AI, travel agencies can improve service personalization, providing users with customized recommendations and travel plans based on their past choices and preferences. The application of AI technologies in travel agencies can improve operational efficiency, reducing the time needed to process reservations and automatically respond to user inquiries through chatbots, which all results in a better user experience. AI can help travel agencies understand market trends and consumer behaviour better, and that can optimize their marketing strategies. The integration of AI into travel agencies' operations puts certain challenges forward, such as the need for employee training and potential ethical dilemmas related to the protection of user data.

The insights presented in this study not only shed light on the crucial role of value co-creation in achieving heightened business performance, but also underscore the transformative impact of AI-based marketing strategies within the travel industry of the Republic of Serbia. This research reveals a strongly positive correlation between the implementation of AI-based marketing strategies and the overall business performance of travel agencies operating within the region. Moreover, it explains how the synergy between

AI-driven marketing approaches and collaborative process of value co-creation amplifies the success metrics of these travel agencies.

Not only do the results of this study validate the existing theoretical frameworks, but they also expand them, confirming all four hypotheses proposed in it. Firstly, it affirms that value co-creation indeed fosters a favourable relation with AI-based marketing strategy (Hypothesis 1). Secondly, it validates the idea that the adoption of AI-based marketing strategies significantly boosts business performance among travel agencies (Hypothesis 2). Thirdly, it establishes a direct positive connection between value co-creation and business performance (Hypothesis 3). Finally, it provides evidence for the mediating role of AI-based marketing strategy in strengthening the link between value co-creation and business performance (Hypothesis 4).

However, it is vital to acknowledge the limitations of this research. The relatively modest sample size may limit the general applicability of the findings. Hence, future research endeavours should prioritize expanding the sample size, encompassing a more diverse pool of respondents from various travel agencies across the Republic of Serbia. Such an approach would not only support the reliability of the conclusions drawn but also offer nuanced insights into the dynamic interaction between value co-creation, AI-based marketing strategies, and business performance within the tourism industry context.

The growing influence of AI in the tourism sector highlights the need for in-depth exploration of AI-driven marketing strategies, particularly those that utilize real-time feedback mechanisms from service interactions. By harnessing AI-generated insights and engaging in collaborative value creation, service organizations, especially in the travel industry, can strengthen their competitive advantage, respond more effectively to evolving user preferences, and enhance business performance.

Conflict of interest

The authors declare no conflict of interest.

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Appendix

Table 1: Questionnaire

Gender:
Male Feminine
Age:
up to 30 years 31-40 years old 41-50 years old more than 50 years
What is your level of education?
elementary school secondary school three-year professional studies four-year academic studies specialist studies master of vocational studies master of academic studies doctoral studies
What position do you hold in this travel agency?
How long have you been employed at this travel agency?
up to 3 years 4-7 years 8-11 years more than 12 years
How long has the travel agency where you are employed been in existence?
up to 5 years 6-10 years 11-15 years 16-20 years 21-25 years 26-30 years 31-35 years over 36 years

How many employees does the travel agency you work for have?

up to 5 employees
6-10 employees
11-15 employees
16-20 employees
21-25 employees
26-30 employees
31-35 employees
36-40 employees
over 40 employees

Co-creation of value with service users (1 - I do not agree, 5 - I completely agree)

1. Our clients participate in the service provision.
1 2 3 4 5
2. Our clients share their service experience with us.
1 2 3 4 5
3. All employees are familiar with the agency's long-term plans regarding service provision.
1 2 3 4 5
4. The travel agency I work in deals with the problems that arise from relations with service users.
1 2 3 4 5

AI-based marketing strategy (1 - I do not agree, 5 - I completely agree)

1. The travel agency I work in employs business markets' segmentation, positioning and targeting.
1 2 3 4 5
2. The travel agency I work in deals with public relations management.
1 2 3 4 5
3. The travel agency I work in monitors all communication channels as to maintain relations with service users.
1 2 3 4 5
4. The travel agency I work in monitors the service users' decision-making process.
1 2 3 4 5
5. The travel agency I work in has a clearly defined pricing strategy.
1 2 3 4 5
6. The travel agency I work in monitors the service users' decision-making process.
1 2 3 4 5
7. The travel agency I work in conducts marketing research.
1 2 3 4 5
8. The travel agency I work in maintains interaction with the service users.
1 2 3 4 5
9. The travel agency I work in receives feedback from the service users.
1 2 3 4 5

Business performance (1 - I do not agree, 5 - I completely agree)

1. The travel agency I work in has more employees than last year.
1 2 3 4 5
2. The travel agency I work in has a larger market share than last year.
1 2 3 4 5

3. The travel agency I work in has sold more travel holidays in comparison to this time last year.

1 2 3 4 5

4. The travel agency I work in meets its goals in terms of performance.

1 2 3 4 5

5. I am happy to be working in this travel agency.

1 2 3 4 5

6. I believe that the future of this travel agency is safe.

1 2 3 4 5

7. I believe that the users are satisfied with the services we provide.

1 2 3 4 5

8. The travel agency I work in has a favorably defined strategy for its position in the future.

1 2 3 4 5

9. There is a continuous improvement of the travel agency I work in.

1 2 3 4 5

10. I believe that the travel agency I work in is successful.

1 2 3 4 5

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Economic indicators of rural destination development oriented to tourism management: The case of ethno villages in Western Serbia

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Abstract

Purpose – This paper explores the economic indicators of rural destination development focused on tourism management, with a specific emphasis on four ethno villages in Western Serbia. Our study, conducted from May 2022 to May 2023, gauges the local community's perceptions of tourism's economic impacts, particularly on women's roles and overall quality of life. **Methodology** – Utilizing Chi-Square Tests, we assessed key economic dimensions such as employment, arts, agriculture, tourism, and investments. This methodological approach allows for a comprehensive examination of the multifaceted economic aspects relevant to rural destination development. **Findings** – The results of our study reveal positive influences on various economic dimensions, underscoring the transformative effects of rural tourism. Notably, observed economic aspects exhibit encouraging trends, emphasizing the potential for rural tourism to contribute positively to the economic landscape. **Implications** – Despite the positive outcomes, persistent gender imbalances underscore the need for targeted interventions aimed at enhancing women's participation in the local economy's development. This study contributes valuable insights into the nuanced relationship between rural tourism and economic advancement, emphasizing the imperative for inclusive strategies in tourism management and addressing gender disparities for comprehensive rural development.

Keywords: rural tourism, economic impact, tourism management, rural development, Serbia
JEL classification: O13, Q01, Z32

Ekonomski pokazatelji razvoja ruralnih destinacija orijentisani na menadžment u turizmu: Slučaj etno sela u Zapadnoj Srbiji

Sažetak

Svrha – U radu se istražuju ekonomski pokazatelji razvoja ruralnih destinacija fokusiranih na turistički menadžment, sa posebnim akcentom na četiri etno sela u Zapadnoj Srbiji. Naša studija, sprovedena od maja 2022. do maja 2023. godine, meri percepciju lokalne zajednice o ekonomskim uticajima turizma, posebno na uloge žena i ukupan kvalitet života.

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Metodologija – Koristeći Hi-kvadrat testove, procenili smo ključne ekonomske dimenzije kao što su zapošljavanje, umetnost, poljoprivreda, turizam i investicije. Ovaj metodološki pristup omogućava sveobuhvatno ispitivanje višestrukih ekonomskih aspekata relevantnih za razvoj ruralnih destinacija. **Rezultati** – Rezultati našeg istraživanja otkrivaju pozitivne uticaje na različite ekonomske dimenzije, naglašavajući transformativne efekte ruralnog turizma. Posebno, posmatrani ekonomski aspekti pokazuju ohrabrujuće trendove, naglašavajući potencijal seoskog turizma da pozitivno doprinese ekonomskom pejzažu. **Implikacije** – Uprkos pozitivnim ishodima, stalna rodna neravnoteža naglašava potrebu za ciljanim intervencijama koje imaju za cilj povećanje učešća žena u razvoju lokalne ekonomije. Ova studija doprinosi dragocenom uvidu u nijansirani odnos između ruralnog turizma i ekonomskog napretka, naglašavajući imperativ inkluzivnih strategija u upravljanju turizmom i rešavanje rodnih dispariteta za sveobuhvatan ruralni razvoj.

Ključne reči: ruralni turizam, ekonomski uticaj, turistički menadžment, ruralni razvoj, Srbija
JEL klasifikacija: O13, Q01, Z32

1. Introduction

The symbiotic connection between tourism and economic development is becoming more apparent (Jansen, 2023; Pascariu et al., 2021), with rural destinations playing an important part in this relationship (Mair, 2006). As globalization enables more mobility and connection (Khondker, 2023; Paasi & Ferdoush, 2023), rural communities that were previously disregarded are suddenly forced into the spotlight as possible centers for tourism-driven economic growth. According to Popsa (2020), the key advantages of rural tourism extend to every local community, encompassing financial gains, employment prospects, and increased satisfaction among residents. By uncovering the richness of rural life rural tourism, a facet of nature-based tourism, becomes a catalyst for social and economic benefits within local communities (Seal, 2022). De Boer and Dijk (2016) emphasize the dual focus on conservation and local economic development in the partnership between rural tourism initiatives and local communities. While exploring the possibilities for preserving local specificity and economic development in Romanian rural areas, Crăciun et al. (2022) highlight that a few researchers noticed that the primary objective of such a relationship, including impact on overall territorial development (Stefan et al., 2021) is the creation of a favorable environment and improved living standards through the integration of services and production networks (Cândea et al., 2009).

In developing rural tourism destinations, it is crucial to adopt an approach that enhances regional income (Kürüm Varolgüneş et al., 2022). Rural tourism should be a source of profit for the local communities that support and promote it, ensuring that the investments of local entrepreneurs are not only recovered but also doubled through the income generated by tourism (Crăciun et al., 2022; Dezsi et al., 2014). This implies an active and clearly defined management strategy in the destination. The importance of the successful management of rural tourism is the focus of Canh and Thanh (2020) who define it as a dynamic continuum that encompasses strategic and operational processes, wherein operational actions are interconnected and evolve from destination policy development, planning, and strategy formulation. Considering this, Ćurčić et al. (2021) maintain that the literature makes it clear that in rural tourism management, there is a simplification of the essential need to involve the host community in the management process. They also add that facilitating increased participation of individuals in development initiatives holds significant importance for attaining both effective and sustainable development. In that way, there is a potential for greater economic benefit from rural tourism for the local community and the method to retain the people in the rural environment. The function of rural tourism in fostering

economic diversification establishes a mechanism for retaining individuals (Wijijayanti et al., 2023). Emphasizing the essential requirement to diversify economic activities, it is widely regarded as crucial for households to attain sufficient income and reach a specific standard of living.

Moreover, the opportunity for economic empowerment is recognized in women's entrepreneurship, and its alignment with improving women's status, family, and community well-being is emphasized (Haugh & Talwar, 2016; Vuković et al., 2023). According to Karthik (2023), rural tourism has the potential to serve as an advantageous alternative for empowering and uplifting women in rural areas. Therefore, this aspect will be also observed in this study.

Understanding the economic dynamics of rural destinations necessitates an exploration of diverse indicators that encompass both micro and macro perspectives. At the macro level, indicators such as GDP contribution, employment generation, and infrastructure development provide a holistic view of the impact of tourism on the regional economy. On a micro level, community engagement, income distribution, and entrepreneurial activities offer insights into the nuanced fabric of rural societies. This research navigates the specific economic indicators shaping the trajectory of these villages, emphasizing critical variables such as employment opportunities, arts and handicrafts, agriculture, human relationships, tourism, investments, women entrepreneurship, and women empowerment.

Given this context, this study delves into the complex economic factors that shape the path of rural destinations, with a focus on the ethnic communities that are scattered across the countryside of Western Serbia. In this research, we focus on several economic variables such as employment opportunities, arts and handicrafts, agriculture, human relationships, tourism, and investments. These variables play a significant role in establishing sustainable economic development of Koštunići, Vraneša, Sunčana reka, and Sirogojno – ethno villages in Western Serbia. The selected ethno-villages stand out for their rich cultural heritage, ethnic diversity, and strategic geographical location in Western Serbia. These characteristics make them ideal subjects for studying the economic impacts of tourism, community engagement, and the enhancement of women's roles, providing valuable insights into rural destination management and sustainable development strategies. In addition, acknowledging the transformative role of women in rural tourism is imperative for a comprehensive understanding of the economic landscape. In the context of the study area, women are active contributors to entrepreneurship and community development. While previous studies have examined the economic impacts of tourism, little attention has been paid to the specific roles and contributions of women within these rural communities. By focusing on women's involvement, the study seeks to uncover barriers, opportunities, and strategies for enhancing gender equality and empowerment in economic activities such as crafts, agriculture, and tourism. Understanding women's roles in economic development is crucial for fostering inclusive growth and sustainable livelihoods in ethno villages, thus highlighting the significance of this research endeavor.

2. Materials and methods

In our study, we relied on the local community's viewpoints to assess how tourism impacts their quality of life economically and socially. We adapted our methodology from Monterrubio et al. (2020), who sought the local population's insights into the primary impacts of tourism development in rural areas. Our objective was to convey the local community's perspectives on the consequences of tourism development, specifically the transformation of ethno villages and objects into tourist attractions, on the quality of life in the surrounding villages. With a particular focus on women's roles and their impact on

overall quality of life, we anticipated positive outcomes. Conducted from May 2022 to May 2023, our research covered the local population of eco-ethno villages in Western Serbia — Koštunići, Vraneša, Sunčana reka, and Sirogojno. A total of 469 respondents participated, providing ratings on a 1-5 ordinal scale, where 1 represented the most negative impact, 5 the most positive, and 3 indicated no change. We utilized a Likert scale to gauge the gradation of attitudes.

The study aimed to assess the significance of specific attitudes within economic and social dimensions, to mitigate negative aspects and highlight positive elements in the development of rural destinations. In this research, we focused on variables that were presumed to exert the most significant influence on the quality of life for the local population. The dependent variable examined is economic impacts (Employment opportunities, Arts and handicrafts, Agriculture, Tourism, and Investments). Among the independent variables, we incorporated "Gender" into the study. To explore the potential associations between variables and the likelihood of connection, Chi-Square Tests were employed. The initial assumption was that there would be no disparity in responses based on the gender of the participants, and statistically significant differences were defined as those with p-values less than 0.05.

From that point, the following primary and supporting hypotheses may be derived:

H1: The development of ethno-villages in Western Serbia is strongly influenced by the economic indicators of Sustainable Tourism Development.

H1a: Development of tourism in ethno-villages in Western Serbia directly affects the empowerment of women in rural areas.

H1b: The openness of the local administration towards tourists has a positive effect on the development of rural tourism in the ethno-villages of Western Serbia.

In their work, Monterrubio et al. (2020) investigated sustainability indicators (economic, sociological, and ecological) influenced by tourism development and their impacts on the local population. It was shown that all three indicators of sustainability are equally important from the aspect of tourism development, but that the positive or negative impacts of tourism are directly proportional to the form of tourism that develops at the destination. Monterrubio et al. (2020), point out that the local population has a negative attitude towards the development of certain forms of tourism, even when it comes to economic indicators. The works of other researchers support their findings. According to Ingelmo (2013), ecological indicators of sustainability indicate that it is important for the destination that the forms of tourism that develop there are themselves sustainable (ecotourism, rural tourism). Atzori et al. (2019) indicate that tourists who visit destinations are a reflection of the form of tourism that develops there, that is, they indicate the importance of sociological indicators of sustainability. According to Hussain et al. (2023), rural tourism is a sustainable, responsible and desirable form of tourism, especially from the aspect of sociological and ecological indicators. Also, all these scientists claim that the often positive economic effects of tourism development on the destination lead to negative ecological and sociological indicators, which can negatively affect the perception of tourism development in the future. In our work, we wanted to show that the development of rural tourism in the destination will be positively influenced by the positive economic effects of the development of rural tourism in the region of Western Serbia, that is, that the economic indicators of sustainable development of rural tourism have a push-up effect among the local population.

The paper specifically assesses the perceptions of the local community regarding tourism's economic impacts, particularly emphasizing women's roles and overall quality of life. This research comprehensively assesses key dimensions including employment, arts, agriculture,

tourism, investments, and women empowerment, providing a multifaceted view of rural destination development.

While this study provides valuable insights into the economic indicators shaping the trajectory of ethno villages in Western Serbia, a few limitations should be acknowledged. Firstly, the research relies on data collected from a specific set of ethno-villages within Western Serbia, which may limit the generalizability of the findings to other rural areas or regions with different socio-economic contexts. Future research could expand the scope to include a broader range of ethno-villages across Serbia to provide a more comprehensive understanding of rural tourism dynamics in the country. Secondly, the study primarily relies on self-reported data from the local community, which may be subject to bias or inaccuracies. Future research could incorporate additional data sources, such as interviews with key stakeholders or observations of tourist activities, to obtain additional credibility of the findings and enhance the validity of the results. Future research could also examine the role of external factors such as government policies, market trends, or global events, which may influence the economic development of ethno villages and their interaction with local dynamics to provide a more nuanced understanding of rural tourism dynamics in Western Serbia.

3. Results and discussion

Rural tourism had a similar impact on much better employment opportunities for both genders (Table 1), which can be considered expected considering that the chances of creating new jobs are one of the basic concepts of rural tourism (Singh et al., 2022). This indicates that representatives of the local population have seen that tourists, in addition to spending on accommodation, often spend their money in village shops, catering establishments, markets, etc. They are an excellent market for local producers, thus providing opportunities for local business development (Aytuğ & Mikaeili, 2017).

Table 1: Employment opportunities

			Gender		Total
			Male	Female	
Employment opportunities	No change	Count	8	13	21
		% of Total	1.7%	2.8%	4.5%
	Better	Count	22	9	31
		% of Total	4.7%	1.9%	6.6%
	Much better	Count	226	190	416
		% of Total	48.3%	40.6%	88.9%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

In terms of employment opportunities, rural tourism has a similar impact for both genders, but a slight imbalance in favor of men can be seen (Table 2). This indicates the need to do more to create jobs for women in rural areas. In the Master Plan for Sustainable Development of Rural Tourism in Serbia (2011, p. 119), it is suggested that the development of traditional activities that are mainly related to women should be encouraged and thus contribute to their employment (Panić & Popesku, 2021).

Table 2: Pearson Chi-Square Test

	Value	Df	Statistical significance (p)
Pearson Chi-Square Test	5.671[a]	2	0.059

* The value is significant at the level equaling 0.05
Source: Authors' research

A significantly high proportion of respondents reported much better arts and handicrafts due to rural tourism (Table 3). To maintain and preserve the special features of the area, by valorizing traditional painting and craftsmanship, representatives of the local community use rural tourism as a platform for promoting these special features, as well as for creating an authentic tourist experience. Many professionals have emphasized that tourism plays a role in supporting these activities, both in recognizing their value and in the purchase of locally crafted goods (Kumar et al., 2020).

Table 3: Arts and handicrafts

			Gender		Total
			Male	Female	
Arts and handicrafts	No change	Count	11	8	19
		% of Total	2.4%	1.7%	4.1%
	Better	Count	24	2	26
		% of Total	5.1%	0.4%	5.6%
	Much better	Count	221	202	423
		% of Total	47.2%	43.2%	90.4%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

Despite the uniform attitudes on this issue, there is a great imbalance in the use of arts and handicrafts as a result of the emergence of rural tourism (Table 4). The engagement of women in fostering rural tourism development is exemplified through their involvement in creating various handicrafts (Vujko et al., 2018). This represents a potential sector that, with minimal investment, can offer opportunities for self-employment and income generation.

Table 4: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	15.947[a]	2	0.000

* The value is significant at the level equaling 0.05
Source: Authors' research

A similar proportion of males and females reported (Table 5) no change in agriculture due to rural tourism (2.6%). This indicates that rural tourism contributed a lot to the accelerated development of agriculture as well as the marketing of agricultural products. Local food products play a significant role in raising the quality of the overall tourist experience, whether they are used in the preparation of food served to guests or sold raw, as a kind of souvenir. The authenticity of domestic products and the methods of their preparation play an important role in the planning and development of rural tourism (Obradović et al., 2023).

Table 5: Agriculture

			Gender		Total
			Male	Female	
Agriculture	No change	Count	5	7	12
		% of Total	1.1%	1.5%	2.6%
	Better	Count	16	3	19
		% of Total	3.4%	0.6%	4.1%
	Much better	Count	235	202	437
		% of Total	50.2%	43.2%	93.4%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

The Pearson Chi-Square Test indicates that there is significant unevenness regarding the impact of rural tourism on agricultural development (Table 6). This data can be viewed from the context of the participation of women and men in agricultural work. As a rule, women participate more in jobs related to the household and agricultural activities, at the same time often not having equal rights to the distribution of income (Gajić & Vukolić, 2021).

Table 6: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	7.651[a]	2	0.022

* The value is significant at the level equaling 0.05

Source: Authors' research

The largest number of respondents of both genders noticed significant changes for the better in terms of human relations, as a result of the development of rural tourism (Table 7). This confirms the thesis that different forms of rural tourism, such as agrotourism for example, positively influence the understanding of different cultural characteristics and traditional practices that positively influence the development of interpersonal relationships (Chikuta & Makacha, 2016). This is also reflected in the creation of better cooperation between local entrepreneurs, and as a result, in the more efficient development of the local economy.

Table 7: Human relationships

			Gender		Total
			Male	Female	
Human relationships	No change	Count	10	10	20
		% of Total	2.1%	2.1%	4.3%
	Better	Count	20	2	22
		% of Total	4.3%	0.4%	4.7%
	Much better	Count	226	200	426
		% of Total	48.3%	42.7%	91.0%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

Despite the fact that both genders indicated a significant improvement in interpersonal relations, there is a noticeable inequality in the distribution of these attitudes (Table 8).

According to Vujko et al. (2018), due to traditional practices regarding the organization of hierarchy and relationships in rural households, women notice more the changes that rural tourism brings regarding the development of more open interpersonal relationships (Maksimović et al., 2019). This leads to the establishment of better cooperation between all participants in the local economy, whether they are directly or indirectly involved in creating the tourist offer of the observed tourist sites.

Table 8: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	12.286[a]	2	0.002

* The value is significant at the level equaling 0.05
Source: Authors' research

The largest number of respondents of both genders (96.1%) notice changes in terms of tourism development in the observed areas (Table 9). Bearing in mind that rural tourism is the basic tourist product in less developed places, it is certain that its development has the greatest impact on overall tourism development. The development of rural tourism is not the independent development of tourist resources, tourist economy or tourist services, nor the partial inclusion of these links, but the "comprehensive development" of all links in the tourism system (Tieyan, 2023).

Table 9: Tourism

			Gender		Total
			Male	Female	
Tourism	No change	Count	7	11	18
		% of Total	1.5%	2.4%	3.8%
	Better	Count	15	2	17
		% of Total	3.2%	0.4%	3.6%
	Much better	Count	234	199	433
		% of Total	50.0%	42.5%	92.5%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

A significantly higher proportion of males reported a much better tourism development experience due to rural tourism. The largest number of respondents of both genders (96.1%) notice changes in terms of tourism development in the observed areas (Table 9). Bearing in mind that rural tourism is the basic tourist product in less developed places, it is certain that its development has the greatest impact on overall tourism development. The development of rural tourism is not the independent development of tourist resources, tourist economy or tourist services, nor the partial inclusion of these links, but the "comprehensive development" of all links in the tourism system (Tieyan, 2023). Women are considered a passive workforce in rural tourism (Rasanjali et al., 2021).

Table 10: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	9.607[a]	2	0.008

* The value is significant at the level equaling 0.05
Source: Authors' research

Both genders have reported much better experiences in other aspects due to rural tourism – 91.9% (Table 10). These data tell us that the development of rural tourism (Balaguer & Cantavella-Jorda, 2002) has contributed to a better experience of the local population in all aspects that are directly or indirectly related to the tourist economy, and were not previously analyzed (Vujko et al., 2021). That indicates that the development of rural tourism attractions contributes to the overall enhancement of rural economic administration (Blake, 2009; Gao & Wu, 2017).

Both genders have reported a better climate for investments (93.5%) as a result of rural tourism development in the observed areas (Table 11). This development supports the effort of the local community to be more engaged in the development by investing the rural tourism offerings (Fotiadis et al., 2019; Garrod et al., 2006). Likewise, the investments in tourism activities come outside the local community as well (Einali et al., 2023), thereby creating additional room for the development of tourist infrastructure and content in the tourism destination.

Table 11: Investments

			Gender		Total
			Male	Female	
Investments	No change	Count	13	17	30
		% of Total	2.8%	3.6%	6.4%
	Better	Count	154	141	295
		% of Total	32.9%	30.1%	63.0%
	Much better	Count	89	54	143
		% of Total	19.0%	11.5%	30.5%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

Wily (2021) states that women experience greater distress from land investments than men. In societies dominated by patriarchy, women and girls face increased risks without commensurate benefits from these investments. Yet, the Pearson Chi-Square Test (Table 12) indicates that in this example there is no significant unevenness in attitudes between the genders regarding the increase in investments as a result of rural development. This indicates that both men and women equally feel that with the development of tourism in rural areas, there is a greater number of investments, both from the local population and foreign capital. Investments in this context can be considered not just in terms of investing in agricultural assets (Edafe et al., 2023) but also in terms of technical infrastructure, such as dedicating resources to renewable energy sources (Woollacott et al., 2023) which is completely in line with the philosophy of sustainable development.

Table 12: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	5.585[a]	2	0.061

* The value is significant at the level equaling 0.05

Source: Authors' research

Only 8.5% of all respondents have not seen any changes in the involvement of women entrepreneurship (Table 13) as a result of rural tourism development. Female entrepreneurs in rural tourism may be more constrained by existing patterns in the economic sector (Nordbø, 2022), and which makes the result very encouraging when the observed areas are

analysed. This implies that in rural areas, especially those with a historically male-centric demographic, women who lack professional interests or jobs can seize opportunities to earn, fostering increased economic self-reliance (Vuković et al., 2023) seeing that as a main pull factor considering their desire for more independent work and life (Möller, 2012).

Table 13: Women entrepreneurship

			Gender		Total
			Male	Female	
Women entrepreneurship	No change	Count	23	17	40
		% of Total	4.9%	3.6%	8.5%
	Better	Count	138	116	254
		% of Total	29.5	24.8%	54.3%
	Much better	Count	95	79	174
		% of Total	20.3%	16.9%	37.2%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

Table 14: Pearson Chi-Square Test

	Value	df	Statistical significance (p)
Pearson Chi-Square Test	0.141[a]	2	0.932

* The value is significant at the level equaling 0.05

Source: Authors' research

The balanced impact of enhanced opportunities for female entrepreneurship among both men and women is evident, as indicated by the Pearson Chi-Square Test (Table 14). Opportunities for women's entrepreneurship in rural development encompass activities like rural tourism, eco-tourism, and agricultural tourism (Çolakoğlu et al., 2022). Participation in entrepreneurship within rural tourism significantly economically benefits women, providing them with opportunities for financial independence and empowerment. Moreover, the multiplier economic effects of rural tourism should be emphasized, especially bearing in mind that certain entrepreneurial activities are not directly related to the tourist offer but have economic benefits from it. For example, women who initiate and manage small-scale agro-tourism ventures not only contribute to the economic growth of their communities but also gain direct financial rewards, allowing them to invest in education, healthcare, and other essential needs for themselves and their families.

Table 15: Women empowerment

			Gender		Total
			Male	Female	
Women empowerment	No change	Count	18	15	33
		% of Total	3.8%	3.2%	7.0%
	Better	Count	145	115	260
		% of Total	31.0%	24.6%	55.6%
	Much better	Count	93	82	175
		% of Total	19.9%	17.5%	37.4%
Total		Count	256	212	468
		% of Total	54.7%	45.3%	100%

Source: Authors' research

Over 90% of respondents of both genders agree that with the advent of rural tourism, the position of women in the local community has been strengthened (Table 15). Positive economic effects reflected in the opinion that increasing women's control over economic resources has far-reaching positive effects, acting as a potent catalyst for both gender equality and development (Blumberg, 2005). According to Slathia et al. (2015), the extent of rural tourism's positive impact on women's empowerment hinges on addressing issues such as poverty alleviation.

Table 16: Pearson Chi-Square Test

Attachment 10.	**Value**	**df**	**Statistical significance (p)**
Pearson Chi-Square Test	0.292[a]	2	0.864

* The value is significant at the level equaling 0.05
Source: Authors' research

There is no statistical significance in the difference of attitudes between the genders when talking about the effect of rural development on the empowerment of women in the local community (Table 16). It implies that both genders, on average, tend to share similar views about the effects of rural tourism development on the empowerment of women in the local community.

4. Conclusion

The findings underscore the significant positive influence of rural tourism on employment opportunities, arts and handicrafts, agriculture, human relationships, tourism, and investments in Western Serbia. The development of rural tourism has led to improved employment opportunities, contributing to economic growth in the region. However, there is a notable gender imbalance, with men benefiting slightly more, emphasizing the need for targeted efforts to create more job opportunities for women in rural areas.

Arts and handicrafts have seen a substantial improvement due to rural tourism, with the local community leveraging traditional skills to create authentic tourist experiences. Women's engagement in creating various handicrafts presents a potential sector for self-employment and income generation, requiring minimal investment. Agriculture, a crucial aspect of rural economies, has experienced accelerated development and increased marketing of agricultural products. The significance of local food products in enhancing the overall tourist experience is emphasized, aligning with the authenticity of domestic products in rural tourism development. This plays a crucial role in enhancing the overall tourist experience in the context of rural tourism development and greater economic benefit from selling the products either as raw material for local gastronomic offerings or as food souvenirs that tourists in recent years like to bring home with them.

The development of interpersonal relationships, as a result of rural tourism, has seen substantial positive changes, fostering better cooperation between local entrepreneurs and contributing to more efficient local economic development. This enhanced collaboration not only strengthens community ties but also creates a conducive environment for collective efforts toward sustainable economic growth. Despite both genders reporting improvements, the noticeable inequality in the distribution of these positive changes, particularly observed by women due to traditional practices in rural households, underscores the need for targeted initiatives to address and rectify gender disparities in the ongoing development process.

Rural tourism's impact on tourism development is substantial, as evidenced by both genders acknowledging positive experiences. However, a gender-based disparity in perceptions of

tourism development highlights the need for a more inclusive approach to actively engage women in the tourism economy. Fostering women's participation in decision-making processes within the tourism sector becomes crucial for ensuring that the benefits of tourism development are equitably distributed, contributing to more balanced and inclusive growth in these rural regions.

The study indicates a favorable climate for investments resulting from rural tourism development, supporting the local community's efforts to invest in rural tourism offerings. This positive investment climate not only propels the growth of rural tourism but also creates opportunities for broader economic development in the region. The balanced impact on enhanced opportunities for female entrepreneurship is encouraging, with women in rural areas seizing opportunities for financial independence and empowerment. These entrepreneurial endeavors not only contribute to individual economic well-being but also play a pivotal role in the overall economic landscape of the community.

The research demonstrates that rural tourism not only positively affects economic indicators but also serves as a catalyst for women's empowerment. The strengthened position of women in the local community, as reported by over 90% of respondents, aligns with the broader positive economic effects of rural tourism. This empowerment translates into increased agency for women in decision-making processes, resource control, and community development initiatives. The study affirms that increasing women's control over economic resources has far-reaching positive effects on gender equality and overall community development, signaling a transformative impact of rural tourism beyond its economic contributions. However, enhancing the positive impacts of rural tourism and addressing gender disparities requires a multifaceted approach involving policymakers, local communities, and stakeholders. Policymakers should develop and implement gender-sensitive policies that promote equal access to employment, entrepreneurship opportunities, and leadership roles in rural tourism initiatives. Encouraging the participation of women in leadership roles and creating space for women to voice their opinions and influence decision-making processes can contribute to more inclusive and sustainable rural tourism development. Firstly, women-centric entrepreneurship programs should be established, providing training and financial support to empower women in sectors such as arts, handicrafts, agribusiness, and tourism-related services. Promoting women's handicrafts through cooperatives and marketing platforms can create economic opportunities and preserve cultural heritage. Gender-responsive tourism training should be provided to enhance women's skills and participation in the tourism sector, while leadership development initiatives can empower women to take on decision-making roles within local tourism organizations. Awareness campaigns should challenge gender stereotypes and advocate for gender equality, complemented by institutional support for mainstreaming gender considerations in development agendas. Research and data collection efforts should focus on understanding women's specific needs and experiences in rural tourism, while networking and collaboration can facilitate knowledge sharing and collective advocacy. Through these measures, stakeholders can work towards fostering inclusive and sustainable rural tourism development that benefits both men and women in Western Serbia.

The study's findings provide substantial evidence in support of H1, indicating that the development of ethno-villages in Western Serbia is indeed strongly influenced by the economic indicators of Sustainable Tourism Development. Specifically, the data highlights the pivotal role of tourism in shaping the economic landscape of these rural areas, underscoring the importance of sustainable tourism practices in fostering community growth and development.

The findings provide robust evidence supporting H1a, indicating that the development of tourism in ethno-villages directly contributes to the empowerment of women in rural areas by offering increased economic opportunities and social engagement. Women in these communities are actively involved in various aspects of tourism, including hospitality, artisanal crafts, and cultural preservation, which not only enhances their financial independence but also strengthens their role in decision-making processes within their households and communities. Moreover, the results corroborate H1b by demonstrating that the openness of local administration towards tourists fosters a conducive environment for rural tourism development, facilitating infrastructure improvements, policy reforms, and community partnerships that collectively enhance the attractiveness and sustainability of tourism products in ethno-villages in Western Serbia. Furthermore, the lack of significant inequality in attitudes between genders regarding increased investments suggests a shared positive perspective on the economic benefits of tourism development.

Overall, this study reinforces and extends the existing literature by providing empirical evidence and context-specific insights into the economic indicators shaping the trajectory of ethno villages in Western Serbia. The identification of gender disparities, the transformative role of women, and the local community's perspectives contribute to the academic significance of our study, offering a comprehensive and nuanced understanding of rural tourism and economic development in the specific context of ethno villages. Moreover, our study highlights the importance of interdisciplinary approaches in understanding the multifaceted nature of rural tourism and economic development. By integrating perspectives from economics, sociology, gender studies, and tourism management, we provide a holistic examination of the economic indicators influencing the observed ethno-villages. Thus, this study not only reinforces the academic significance of existing literature but also underscores the value of interdisciplinary research in advancing our understanding of rural tourism and economic development dynamics.

Despite providing valuable insights into the economic indicators shaping the trajectory of ethno villages in Western Serbia, a few limitations of the study should be acknowledged. Firstly, the research relies on data collected from a specific set of ethno-villages within Western Serbia, which may limit the generalizability of the findings to other rural areas or regions with different socio-economic contexts. Future research could expand the scope to include a broader range of ethno-villages across Serbia to provide a more comprehensive understanding of rural tourism dynamics in the country. Secondly, the study primarily relies on self-reported data from the local community, which may be subject to bias or inaccuracies. Future research could incorporate additional data sources, such as interviews with key stakeholders or observations of tourist activities, to obtain additional credibility of the findings and enhance the validity of the results. Further research could also examine the role of external factors such as government policies, market trends, or global events, which may influence the economic development of ethno villages and their interaction with local dynamics to provide a more nuanced understanding of rural tourism dynamics in Western Serbia.

The study's findings contribute significantly to key theories in rural tourism and economic development literature by illuminating the gender disparities within rural tourism development, underscoring the necessity of adopting gender-sensitive approaches to rural economic growth. Monterrubio et al. (2020) highlight the significance of economic, sociological, and ecological indicators in assessing tourism's impact on local populations while underscoring the influence of different forms of tourism on these indicators. Our study extends these insights by demonstrating how the positive economic effects of rural tourism development in Western Serbia positively influence local perceptions and contribute to sustainable rural tourism growth. Moreover, the findings reinforce the importance of

community involvement and collaboration in tourism planning and management, echoing theories advocating for community-based approaches to sustainable development. Additionally, the study highlights the role of entrepreneurship, particularly women's entrepreneurship, in driving economic diversification and innovation within rural economies, aligning with theories emphasizing the importance of leveraging local resources and traditional skills.

Finally, the outcomes underscore the critical need for targeted initiatives aimed at addressing gender disparities within the realm of economic development. It is of utmost importance to create an environment that actively promotes and supports increased participation of both genders in various economic sectors, particularly within the context of rural tourism management, is essential. Furthermore, the findings emphasize the significance of ensuring that the advantages stemming from rural tourism development encompass a comprehensive approach, contributing not only to economic progress but also to the broader societal and cultural advancement of the region.

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Conflict of interest

The authors declare no conflict of interest.

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Digital literacy of farmers in the context of rural tourism services provision in Serbia

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Abstract

Purpose – Digital transformation in the sector of rural tourism, along with the digital literacy of farmers, is increasingly becoming an imperative for the successful operation of rural tourist households. However, research in this field is scarce in Serbia, which motivated the authors to explore it in more detail. The aim of the research was to examine the awareness of the members of rural tourist households of the need and importance of possessing digital literacy for managing the tourist offer, as well as to study the factors affecting this awareness. **Methodology** – We used online survey research and a semi-structured questionnaire designed for these needs. The sample involved 131 rural tourist households. Conclusions were drawn using descriptive statistics and non-parametric statistical technique for comparing groups Kruskal-Wallis test. **Findings** – Members of rural tourist households in Serbia are highly aware of the need and importance of digital literacy for performing tasks in the field of rural tourism. The Kruskal-Wallis test showed that only the respondents' attitude towards the importance of marketing for rural tourism development had a statistically significant effect on these attitudes (p=0.000). **Implications** – Despite the subjectivity inherent in this research, the obtained results enrich scientific knowledge in this field and provide useful information for practitioners and policymakers in the areas of rural development and rural tourism.

Keywords: rural tourist households, digital knowledge & skills, marketing, survey research
JEL classification: D1, J24, R2, Z30

Digitalna pismenost farmera u kontekstu pružanja usluga seoske turističke ponude u Srbiji

Sažetak

Svrha – Digitalna transformacija u sektoru seoske turističke ponude, uz digitalnu pismenost farmera, sve više je imperativ uspešnog poslovanja seoskih turističkih domaćinstava. Ipak, istraživanja ove oblasti u Srbiji su oskudna, što je motivisalo autore da je detaljnije istraže. Cilj istraživanja bio je da se ispita svest članova seoskih turističkih domaćinstava o potrebi i

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značaju posedovanja digitalne pismenosti za upravljanje turističkom ponudom, kao i faktori koji na ovu svest imaju uticaja. **Metodologija** – Koristili smo online anketno istraživanje i polustrukturirani upitnik dizajniran za ove potrebe. Uzorak čini 131 seosko turističko domaćinstvo. Za zaključivanje je korišćena deskriptivna statistika i neparametarska statistička tehnika poređenja grupa Kruskal-Wallis test. **Rezultati** – Članovi seoskih turističkih domaćinstava u Srbiji imaju visoku svest o potrebi i značaju digitalne pismenosti za obavljanje poslova u sektoru seoske turističke ponude. Kruskal-Wallis test pokazao je da statitički značajan uticaj na ove stavove ima samo stav ispitanika o značaju marketinga za razvoj turističke ponude (p=0.000). **Implikacije** – I pored subjektivnosti koja je u osnovi istraživanja, rezultati obogaćuju naučna znanja u ovoj oblasti i pružaju korisne informacije praktičarima i kreatorima javnih politika u oblasti ruralnog razvoja i seoskog turizma.

Ključne reči: seoska turistička domaćinstva, digitalna znanja i veštine, marketing, anketno istraživanje
JEL klasifikacija: D1, J24, R2, Z30

1. Introduction

Rural tourism, as part of the multifunctional agriculture concept (farm-related activities) contributes to strengthening the agricultural sector and local farmers, as well as revitalizing rural areas. Therefore, it significantly attracts the attention of academic circles (Anuj et al., 2023; Kachniewska, 2015; Knickel et al., 2024; Leković et al., 2020; Mihailović et al., 2020; Seetanah & Fauzel, 2023). This form of tourism is an extremely significant segment of agricultural and rural development in Serbia. It brings numerous economic and social benefits for local communities in rural areas, whose survival is greatly endangered by depopulation, migrations and rural poverty (Borović et al., 2022; Bratić, 2021; Dašić et al., 2020; Dimitrijević et al., 2022; Panić et al., 2024; Ristić et al., 2020; Todorović & Bjeljac, 2009; Vesić et al., 2022).

Today the sectors of agriculture and rural tourism, as well as all other sectors of economy and society, are strongly influenced by information and communication technologies (abbr. ICTs). It is indisputable that these sectors are moving in the direction of intensive digital transformation. In the sector of agriculture, Agriculture 4.0 technologies are becoming increasingly prevalent. They involve both highly sophisticated digital solutions in the agricultural production process, as well as less technologically complex, less challenging or demanding solutions which include using the Internet, digital tools and devices, social media marketing and alike (Alavion & Taghdisi, 2021; Bolfe et al. 2020; Elghannam et al., 2020; FAO, 2022; Kernecker et al., 2020; Morepje et al., 2024; Zhong et al., 2024). Also, digitalization has become an imperative for sustainable business activities in the sector of tourism (Anuj et al. 2023; Muangasame & Tan, 2023; Munitlak Ivanović et al., 2020; Ndhlovu et al., 2024; Rodrigues et al., 2023; Schönherr et al., 2023; Seetanah & Fauzel, 2023; Verhun et al., 2022). According to Verhun et al. (2022), the most frequently used digital tools in the field of tourism and hospitality are "*digital marketing in the travel industry; digital presence of companies through travel websites; digital presence of consumers through online travel search, online booking and travel planning technologies; social media*" (p. 869). In addition, digitalization is becoming increasingly present in the field of public services and administration (primarily through eGovernment) and is also affecting the agricultural sector and residents of rural areas (Panganiban, 2019; Sheikh & Berenyi, 2023; Vázquez-López & Marey-Perez, 2021; Zioło et al., 2022).

Serbia is showing improvement in all dimensions of the Digital Economy and Society Index, and in this regard the country is the leader in the region (Regional Cooperation Council, 2022). In all its forms, digitalization is present in the sectors of agriculture and tourism in

Serbia, and farmers and residents of rural areas are already required to communicate with the government through various digital platforms, such as eTourist or eAgrar (Bešić et al., 2024; Ćirić et al., 2018; Dašić et al., 2023; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kljajić et al., 2024; Kovljenić et al., 2023; Lazić et al., 2023; Manasijević et al., 2019; Mihailović et al., 2024; Munitlak Ivanović et al., 2020; Radičić, 2022).

In order to use all the possibilities and benefits offered by the new digital age and Agriculture 4.0 technologies, farmers engaged in agriculture and rural tourism should have a certain level of digital literacy, i.e., they should possess certain digital knowledge and skills. In this paper, the authors follow the definition of digital literacy (abbr. DILT) by Eshet-Alkalai (2004), who defines it as follows: "*more than the mere ability to use software or operate a digital device; it includes a large variety of complex cognitive, motor, sociological, and emotional skills, which users need in order to function effectively in digital environments*" (p. 93).

DILT of farmers in Serbia is not at an impressive level, primarily due to their age and educational structure, low computer literacy and small farm size, which is the reason why the application of digitalization in the agricultural sector is still in its early stages (Dašić et al., 2023; Ilić-Kosanović et al., 2019; Jurjević et al., 2019; Kljajić et al., 2024; Kovljenić et al., 2023; Radičić, 2022). Scarce studies dealing with DILT in the tourism and hospitality sector indicate that employees in this sector and supply-side stakeholders possess only basic digital skills which are mainly defined by their level of education (Lazić et al., 2023; Petković et al. 2024). A gap in these studies is evident when it comes to the bearers of the rural tourist offer, i.e., owners and/or members of rural tourism households (abbr. RTHs) and their DILT.

Bearing in mind the above mentioned, the subject of the paper is examination of the attitudes of the holders of the rural tourist offers in Serbia regarding the need and importance of acquiring digital knowledge and skills in order to successfully manage RTHs in the period of intensive digitalization of this sector. The aim of this research is to identify the factors which affect or may affect the formation of these attitudes. The research hypothesis is that awareness of the need for and importance of digital literacy in RTH management is shaped by factors such as: the region (RTH headquarters), the age and education of rural tourism providers, their experience in that business, views on the importance of marketing for rural tourism development, and also different economic dimensions of engaging in rural tourism.

The examined variable is formulated as "*Awareness of the need and importance of digital literacy for the management of the RTHs*". On the other hand, various demographic, spatial, social and business dimensions of respondents (providers of rural tourism services) were selected as the factors which could have an impact on examined variable, like: (a) region or seat of RTH; (b) age and education of respondents; (c) experience in the field of rural tourism; (d) economic dimension of dealing with rural tourism (capacity size of RTH; content of the tourist offer; degree of satisfaction with tourist visits and occupancy rate, degree of satisfaction with the income from rural tourism); (e) respondents' views on the importance of marketing for rural tourism development.

2. Rural tourism in Serbia: Analysis of the sector

Rural tourism sector in Serbia is under the competence of the Ministry of Tourism and Youth, which keeps records of RTHs on the eTourist portal (on this portal, RTHs submit requests for accommodation categorization and register and deregister tourists). Business operation in this sector is regulated by the Hospitality Law (National Assembly, 2019).

Serbia has enormous potential and a rich resource base in every sense for the development of rural tourism, and thus for the revitalization and sustainable development of rural areas (Borović et al., 2022; Gajić et al., 2018; Panić et al., 2024; Todorović & Bjeljac, 2009; Vesić

et al., 2022; Vujko et al., 2016). Rural tourism services in Serbia have a satisfactory to high level of quality, the regions of Šumadija and Western Serbia stand out as a significant tourist destination, and the expansion of this form of tourism is yet to be expected in the future (Cvijanović et al, 2023; Dimitrijević et al., 2022; Gajić et al., 2023).

The number of agricultural holdings in Serbia that engage in rural tourism as the other gainful activity related to the holding increased between the two Censuses of Agriculture (2012-2023) from 514 (2012) to 880 (2023) (Census of Agriculture 2023). This can be partly explained by the support that RTHs obtain through various competitions provided by the Ministry of Tourism and Youth, the support within the IPARD II programme (Measure 7), and primarily the support provided by the Ministry of Tourism and Youth for the development of the domestic tourist offer by means of voucher distribution schemes. Also, the COVID-19 pandemic led to increased demand in the rural tourism sector in Serbia, bringing new, positive impulses to this sector and raising hopes that engaging in rural tourism could be promising and economically sustainable in the future (Cvijanović et al., 2023; Gajić et al., 2023; Vesić et al., 2022). According to research on the impact of the pandemic on the rural tourism sector in Serbia, a group of authors Cvijanović et al. (2023) indicated that in 2021, compared to the baseline year of 2018, there was an increase in the number of RTHs, as well as in the number of guests and overnight stays in rural tourism, leading to higher revenues for RTHs. In a survey conducted among tourists who used rural tourism accommodation during the pandemic, the authors identified their main reasons for staying in rural areas, and those were: peace and quiet, the beauty of the landscape, relaxation, and homemade food (Cvijanović et al., 2023).

With the strong influence of digitalization and social media in our daily and business lives, growing affirmation of e-marketing, and the popularization of gastronomy (as part of cultural identity), new dimensions and perspectives of development for this form of tourism in Serbia are emerging (Bešić et al., 2024; Gajić et al., 2018; Marković & Pindžo, 2020; Munitlak Ivanović et al., 2020).

However, despite all the above, this sector of tourism in Serbia is still in its initial development phase, with underutilized natural, human, and economic potential (Bratić, 2021; Borović et al., 2022; Gajić et al., 2018). According to the group of authors Borović et al. (2022), "*fragmented and dispersed peasant holdings, orientation towards other types of tourism and mass tourism, insufficiently developed awareness of the value of the environment, are just some of the factors that have influenced the weak development of rural tourism*" (pp. 934-935). In comparative analyses, it is often emphasized that this sector still cannot compete in quality with rural tourism offerings in economically developed European countries (Dimitrijević et al., 2022; Gajić et al., 2018; Vujko et al., 2016).

Key directions for the development of rural tourism in Serbia include educating the population interested in engaging in these activities, strengthening their digital knowledge and skills, improving their organization and cooperation, establishing tourist information points in villages, building appropriate infrastructure, enhancing recreational amenities, and similar initiatives (Bešić et al., 2024; Borović et al., 2022; Bratić, 2021; Ćurčić et al., 2021; Lazić et al., 2023; Petković et al., 2024; Todorović & Bjeljac, 2009). It is essential to monitor market trends, work on market segmentation, invest in marketing and promotion, and establish tourism clusters, where each cluster would identify its market advantage and develop appropriate forms of tourism accordingly—such as agritourism, gastronomic tourism, and ecotourism (Borović et al., 2022; Bratić, 2021). Additionally, policymakers, practitioners, and local community representatives should, in the coming period, place a strong emphasis on a balanced, sustainable, and responsible development of rural tourism in Serbia, where environmental preservation and ecological aspects would gain significantly greater importance (Bešić et al., 2024; Bratić, 2021; Panić et al., 2024).

3. Digital knowledge and skills of farmers and bearers of the tourist offer in Serbia

The Statistical Office of the Republic of Serbia continuously conducts research on the use of ICTs in Serbia, and the data indicate that Serbia is making progress in this area compared to previous years. The results for 2024 show that 73.4% of households in Serbia own a personal computer, while 88.8% have an internet connection (Josipović et al., 2024). Certain advantages in owning and using computers, as well as having internet access, are observed in the Belgrade region (compared to the Southern and Eastern Serbia region), among the younger population compared to the older, more educated individuals compared to the less educated, residents of urban areas compared to other settlements, and households with higher monthly incomes compared to those with the lowest incomes. For example, the digital divide is evident in the following categories of households and individuals (Josipović et al., 2024):

- Type of settlement. In other settlements (which can be interpreted as rural areas), 65% of households own a computer, and 84.3% have an internet connection (compared to 77.5% of households owning a computer and 91.1% having an internet connection in urban areas);
- Household monthly income. In the income category above 90,000 dinars, as many as 94.3% of households own a computer, and 98.7% have an internet connection, while in the income category up to 30,000 dinars, only 25.1% of households own a computer, and 58.1% have an internet connection;
- Age. In the past three months, only 31.3% of older individuals (aged 65-74) used a computer, while 94.8% of individuals in the 16-24 age group used a computer in the same period;
- Education. As many as 92.3% of individuals in the higher education category used a computer in the past three months, compared to 51.0% of those in the no education and primary education category.

The percentage of individuals with basic or above-basic overall digital skills in Serbia for 2023 was 33.6%, while in the EU-27 it was significantly higher (55.6%) (Eurostat database). Serbia also exhibits a digital divide based on age and education. Thus, individuals with basic or above-basic overall digital skills make up only 5.3% of the 65-74 age group, compared to 58.9% of the 25-34 age group. Additionally, the percentage of respondents with basic or above-basic overall digital skills is highest among those with high formal education (58.8%) and lowest among those with no or low formal education (17.7%) (Eurostat database).

DILT in the tourism and hospitality sector. Digital skills of supply-side participants in the tourism and hospitality sector in Serbia have not been sufficiently examined and analyzed in the literature. There are still no studies related to digital knowledge and skills of farmers engaged in rural tourism as the other gainful activity. For now, the researches of Lazić et al. (2023) and Petković et al. (2024) are available. According to Lazić et al. (2023), employees in the tourism and hospitality sector (management and staff job positions) in Serbia are still not sufficiently prepared to work and function in a digital environment, considering the fact that they possess only basic DILT skills which are sufficient for performing simple and technologically undemanding tasks. The results of Lazić et al. (2023) also showed "*notable correlations between digital skills levels and education and job position, highlighting the importance of education in shaping individuals' digital skills*" (p. 35). Studying the digital skills of the tourism supply-side stakeholders in Serbia, Petković et al. (2024) indicated that "*in the tourism and hospitality sector, digital skills become one of the critical factors as they enable organizations and professionals to effectively utilize and adapt to the latest technological developments, improving the overall travel experience and/or operational*

efficiency of service providers" (p. 137). According to this authors' research, low digital skills are particularly present among civil servants, specifically among tourism inspectors in Serbia.

DILT of farmers and rural residents. In Serbia, issues related to the DILT of farmers are primarily associated with the use of: (a) social networks, which are increasingly present in farmers' everyday life and business operations, even among small-scale farmers; (b) the internet and e-marketing; and (c) digital technologies in agricultural production processes (Ćirić et al., 2018; Dašić et al., 2023; Ilić Kosanović et al., 2019; Kljajić et al., 2024; Kovljenić et al., 2023; Sljukic et al., 2021). Although digitalization is becoming more widespread in agricultural practice and it is evident that it has the potential to improve farmers' positions, its growth is significantly limited by the low DILT levels among farmers and the low awareness of the importance of digitalization in business operations. This is the result of numerous factors, and the most significant of which include: the dominance of small-scale family farms (with subsistence or semi-subsistence farming); high land fragmentation; low labor productivity and low economic strength of farms; unfavorable age and educational structure of farmers; insufficient advisory support, and lack of training programs (Dašić et al., 2023; FAO, 2020; FAO, 2022; Horvat et al., 2020; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kovljenić et al., 2023; Paraušić et al., 2021; Radičić, 2022; Sljukic et al., 2021).

Data from the 2023 Census of Agriculture indicate that the average size of a family farm in Serbia is only 5.7 hectares, while its average economic size is €10,497 (Census of Agriculture, 2023). As many as 44.6% of farm managers belong to the 65+ age group, 54% from the total number of farm managers have only completed primary school, and during 2023, only 2.8% of farm managers attended agricultural training courses (Census of Agriculture, 2023). As a result of such an unfavorable structure of agriculture, the following data related to the application of computers in business are not surprising. Namely, only one-third of agricultural holdings have internet access, only 6.6% use a computer to improve agricultural business operations, and just 1.7% use some type of farm management software (Census of Agriculture, 2023).

Ćirić et al. (2018) highlight a correlation between farmers' innovativeness (willingness to adopt new ideas and technologies) and their readiness to accept the internet and social networks in daily business operations. However, numerous authors argue that DILT among Serbian farmers is significantly influenced by their age, education, and economic strength (income from farming or other activities) (Dašić et al., 2023; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kovljenić et al., 2023; Radičić, 2022). More developed digital skills (which impact the broader acceptance of the internet, social networks, e-business, and digitalization of business processes) are more common among: younger farmers, more educated farmers, and farmers with greater economic strength (Dašić et al., 2023; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kovljenić et al., 2023). In general, the unfavorable age and educational structure of farmers, the absence of training programs and advisory support, along with the low economic and financial strength of farms, are the main reasons contributing to the low DILT levels among farmers in Serbia.

In considering the digital literacy of farmers in Serbia, experiences from other countries can be useful. So, in the study examining the factors affecting the adoption of ICTs (e-marketing) by the rural population in Iran, Khalil Moghaddam and Khatoon-Abadi (2013) underline that the expansion of informatics in school curricula and popularity of internet-based jobs among the young generation in Iran are important factors for the adoption of ICTs. They also state that a higher education level of the family members, as well as greater application of ICTs in the household are positively correlated with the adoption of ICTs, i.e., adoption of e-marketing by respondents (users of the Gharn Abad ICT centre). However, there is no

correlation between the formal education of the Gharn Abad ICT centre users and ICT adoption. Similarly, no correlation was found between the adoption of ICTs and the economic status of respondents (users of the Gharn Abad ICT centre) (Khalil-Moghaddam & Khatoon-Abadi, 2013). Using an example of Ghana, Abdulai et al. (2023) examined factors which affected the possibility of small-scale farmers' participation in digital agricultural services. The results showed that the following groups were more likely to participate: (a) men (compared to women); (b) farmers belonging to a farmers' association; (c) farmers with a better access to extension services; as well as (d) farmers who possess mobile phones and possibility to make phone calls. Analyzing the application of the eGovernance digital platform in the agriculture of Bangladesh, Sheikh and Berenyi (2023) emphasize the low capability of primarily conventional and poor small-scale farmers to adjust to the digital age. Kernecker et al. (2020) express a similar attitude stating that the adoption of digital solutions in agriculture increases with the size of the farm. Simultaneously, Zhong et al. (2024) believe that age and level of education have a significant impact on the Internet skills of individuals and development of e-commerce in the agricultural sector.

Recommendations. It is unquestionable that digital competencies of farmers and rural residents should be improved in order to be adapted to the digital age. In the process, significant attention should be paid to older generations of farmers, those with lower levels of education and small-scale farmers. Government bodies and departments, as well as development agencies, should have a critical role in the process. Throughout the literature, it is underlined that support for improving the DILT of rural population is primarily necessary in the following fields: (a) providing information and education on using ICTs (formal and informal education, organizing different educational and training programmes; opening digital centers and educational facilities, etc.); (b) facilitated access to digital tools (mobile phones, computers, the Internet, etc.); (c) empowering farmers' associations/groups; (d) more efficient access of farmers to extension services, along with strengthening the capacity of these services; (e) investing in rural infrastructure (physical and communication infrastructure), particularly in remote and inaccessible areas (Abdulai et al., 2023; Alavion & Taghdisi, 2021; Dašić et al., 2023; FAO, 2022; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kovljenić et al., 2023; Mokhtar et al., 2022; Panganiban, 2019; Sheikh & Berenyi, 2023; Vázquez-López & Marey-Perez, 2021).

4. Materials and methods

Sample of respondents. The sample includes representatives of agricultural holdings based in Serbia, which deal with rural tourism as the other gainful activity (related to the holding). At the beginning of the questionnaire, the researchers underlined the request for the questionnaire to be completed by the individuals who are most engaged in operational and management activities in RTH. Due to the nature of the research, purposeful-random sampling was used, while participation in the questionnaire was anonymous. The methods of sampling and surveying, as well as the sample size, ensure the representativeness of the sample for research, as well as the credibility of the results.

The sample includes the representatives of 132 RTHs in Serbia, accounting for 15% of the total number of households which stated that they engaged in tourism as the other gainful activity in the 2023 Census of Agriculture (Census of Agriculture, 2023). At the same time, due to the low response of RTHs in the Belgrade region (only one response), this household was excluded from further analysis. Therefore, the sample was lowered to 131, but its representativeness and reliability of the results were not altered.

Due to the exclusion of one RTH from the Belgrade region, the sample encompassed three regions in Serbia. The sample structure per region is as follows: Vojvodina region (8%),

Šumadija and Western Serbia region (60%), and Southern and Eastern Serbia region (33%). The territorial distribution of the RTHs in the sample is also highly representative, i.e., it is adjusted to the regional distribution of households recorded by the 2023 Census of Agriculture as engaging in tourism as the other gainful activity (Census of Agriculture, 2023).

***Description of the study*.** For the needs of the research and data collection, the authors used survey research which Sapsford (2007) defines as "*the collection of quantified data from a population for purposes of description or to identify covariation between variables that may point to casual relationships or predictive patterns of influence*" (p. 3). A semi-structured questionnaire was prepared and designed. It contained a large number of questions but only a set of questions was used for the requirements of this paper. A comprehensive review of the literature preceded the creation of the questionnaire. In order to check the questionnaire validity, a pilot study was conducted (an online study by means of a pre-test questionnaire). The final version of the questionnaire was created after correcting unclear or ambiguous questions. In addition, prior to finalizing the interview, the authors conducted semi-structured interviews by phone with three RTH representatives.

Data collection was carried out by distributing the final questionnaire to respondents accompanied by a request to complete it. The questionnaire was sent online using the Google Forms software. The distribution process was mainly conducted by sending a link to the questionnaire electronically (via email or Viber) to RTH representatives, whose contacts were obtained with the help of the representatives of various tourist organizations. The online survey was conducted from November 2023 to May 2024. The response rate was 70% and the final sample size (RTH representatives who completed and electronically sent the questionnaire) amounted to 132 RTHs.

Variables in the research. In order to provide responses to the asked research questions one continuous variable and nine categorical variables were used.

The continuous variable was defined as follows: "*Awareness of the need and importance of digital literacy for the management of the RTH*". DILT was explained to respondents using the following concepts: Internet skills; smartphone and social media marketing skills; computer proficiency; skills of Viber communication and communication via other social networks; knowledge and usage of online advertising, and alike. Using the Likert scale, respondents evaluated this variable using ratings from 1 to 5: rating 1 – no need or significance; rating 5 – extremely high need and significance.

Categorical variables of factors used to create respondent groups are presented in Table 1. These variables refer to various dimensions of RTHs (spatial, demographic, social and business dimensions), while three variables refer to examining respondents' attitudes related to the satisfaction with rural tourism income, tourist visits and occupancy rates, as well as their views on the importance of marketing for successful RTH management. These variables were selected based on the comprehensive literature review (Dašić et al., 2023; Ilić Kosanović et al., 2019; Jurjević et al., 2019; Kernecker et al., 2020; Khalil-Moghaddam & Khatoon-Abadi, 2013; Lazić et al., 2023; Petković et al. 2024; Sheikh & Berenyi, 2023; Zhong et al., 2024).

Table 1: Categorical variables in the research

Name of the factors	Levels of the factors
Region (seat of the RTH)	Gp1: Vojvodina; Gp2: Šumadija and Zapadna Srbija; Gp3: Južna and Istočna Srbija;
Age of the person most involved in operational and management activities in RTH	Gp1: Young (≤40); Gp2: Middle-aged (41-64); Gp3: Elderly (≥65);
Education of the person most involved in operational and management activities in RTH	Gp1: Primary school; Gp2: Secondary (high) school; Gp3: Faculty, Master's degree, Ph.D.;
Experience in the field of rural tourism (years of dealing with rural tourism)	Gp1: Beginners and less experienced (less than 5 years); Gp2: Moderately experienced (5-14 years); Gp3: Very experienced (15 years or more);
Capacity size (number of individual beds per household)	Gp1: Small capacity (1-4 beds); Gp2: Medium-size capacity (5-9 beds); Gp3: Large capacity (≥ 10 beds)
Content of the tourist offer	Gp1: Accommodation only; Gp2: Full board (accommodation with food and beverage service); Gp3: Full board and other activities
Satisfaction with tourist visits and occupancy rates*	Gp1: Dissatisfied to slightly satisfied; Gp2: Moderately satisfied; Gp3: Satisfied to extremely satisfied
Satisfaction with the income from rural tourism*	
Importance of marketing for rural tourism development (advertising, farm promotion, etc.)**	Gp1: Not important to slightly important, Gp2: Moderately important; Gp3: Important to extremely important;

***** The groups were formed based on the responses to the question: "How satisfied are you with tourist visits to your RTH and occupancy rates?" and "How satisfied are you with the income from rural tourism?". The responses were given on the Likert scale in the range from 1 (Dissatisfied) to 5 (Extremely satisfied)

****** The groups were formed based on the response to the question "How important are knowledge and investment in marketing for RTH management?". The responses were given on the Likert scale in the range from 1 (Not important) to 5 (Extremely important)

Source: Authors' research

Statistical procedures. Conclusions were drawn using descriptive statistics, as well as non-parametric statistical technique for comparing groups based on the values of the continuous examined variable (Kruskal-Wallis test). This test was used for testing the null hypothesis (*No*) stating that *k* (*k*>2) independent samples belong to the same base set, i. e., that there is no difference in the mean ranks and medians of the continuous variable between the three base sets to which the samples (respondent groups) belong. All necessary assumptions for the application of these techniques were fulfilled: random, independent samples belonged to continuous sets; data for the examined variable were available in the form of ranks, i.e., on an ordinal measurement scale. The selection of this technique proved to be appropriate for the nature of the research, the variable types, and also in accordance with the test results that indicate that the continuous variable does not have a normal distribution (Sig. of tests especially of Kolmogorev-Smirnov test is not greater than 0.05) (Table 2).

Table 2: Tests of normality

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	df	Sig.	Statistic	df	Sig.
Awareness of the need and importance of digital literacy for the management of the RTH	0.336	131	0.000	0.713	131	0.000

a. Lilliefors Significance Correction

Source: Authors' research

The data were processed using the statistical software Statistical Package for Social Sciences (SPSS). An alpha level of 0.05 was used as the basis for the conclusions.

5. Results and discussion

Sample description. When it comes to the question which individual (individuals) in RTH is most engaged in operational and management activities related to rural tourism, the response structure shows that these are mainly female individuals (since 59% of respondents provided this response), with a quarter of respondents stating that these are male individuals, and 16% of them stating that several people are engaged in these activities (the most frequent response is that all or most family members are involved).

Regarding the structure of people in RTHs who are most engaged in operational and management activities related to tourism according to age and education, the results indicate the following:

- ✓ the group of young individuals (≤ 40) involved the lowest number of respondents, only 20 (18%);
- ✓ the group of middle-aged individuals (41-64) contained the largest number of respondents, 67 (61%),
- ✓ the elderly group (≥ 65) included 23 respondents (21%);
- ✓ there are only 9 respondents with only elementary education (8%);
- ✓ there are 66 respondents with secondary education (60.0%);
- ✓ there are 35 (32%) respondents with higher education (college, faculty, master's degree, Ph.D.)

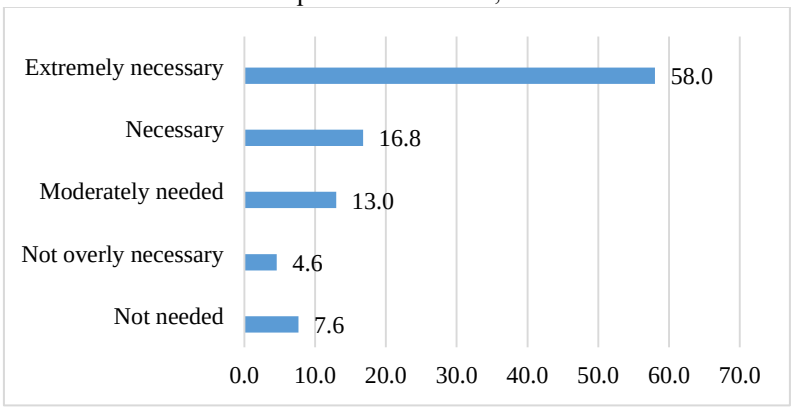
Regarding the experience in rural tourism, the largest percentage of respondents (43%) have been engaged in this activity for 5 to 14 years, which makes them moderately experienced. About a third of respondents are beginners (with up to 5 years of experience), while about a quarter are experienced respondents (with 15 or more years of experience).

The capacity size indicates that the largest percentage of respondents (47%) have medium-size capacities (with 5-9 individual beds). Approximately a third have larger accommodation capacities (10 or more individual beds), while about a quarter have small accommodation capacities (1-4 individual beds). Regarding the structure of the tourist offer, it is interesting to note that approximately the same percentage of respondents stated that they offered only accommodation (32%), or accommodation with food (37%), or accommodation including food and other activities, such as organizing excursions, renting bicycles, etc. (31%).

Description of the continuous variable. The average rating of the variable "*Awareness of the need and importance of digital literacy for the management of RTH*" amounts to 4.13, MED=5, Mode=5. The IQR (interquartile range) is 2 and indicates that 50% of mid-position responses (percentiles 25-75) of respondents were in the range from the rating of 3 to the

maximum rating of 5. Figure 1 shows the response scale, where it can be noticed that as many as 58% of respondents provided the highest rating for this variable.

Figure 1: Awareness of the need and importance of DILT for the management of RTH, respondents' answers, %



Source: Authors' research

Testing of Ho. Table 3 shows the results of the *Ho* testing by applying the Kruskal-Wallis test for examining the differences in the values (Mean rank and MED) of the continuous variable accorting to the levels of the factors.

Table 3: Testing the differences in the values of the continuous variable between the groups

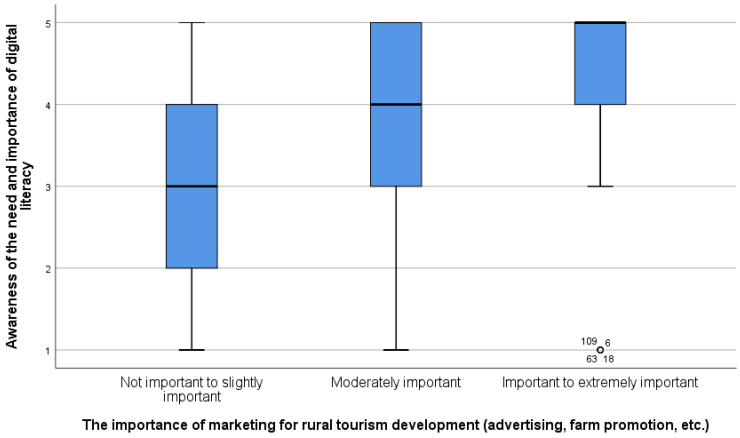
Factors	**Continuous variable: Awareness of the need and importance of digital literacy for the management of RTH**
Region (seat of RTH)	Gp1, n=10: Vojvodina, Mean rank=70.00; Gp2, n=78: Šumadija and Zapadna Srbija, Mean rank=68.36; Gp3, n=43: Južna and Istočna Srbija, Mean rank=60.79; χ^2 (2, n=131)=1.533, *p*=0.465. No statistical significance*
Age of the person most involved in operational and management activities at RTH*	Gp1, n=20: Young, Mean rank=60.18; Gp2, n=67: Middle-aged, Mean rank=57.67; Gp3, n=23: Elderly, Mean rank=45.11; χ^2 (2, n=110)=4.044, *p*=0.132. No statistical significance*
Education of the person most involved in operational and management activities at RTH*	Gp1, n=9: Primary school, Mean rank=43.00; Gp2, n=66: Secondary school, Mean rank=56.05; Gp3, n=35: Higher education (faculty, master's degree, PhD), Mean rank=57.69; χ^2 (2, n=110)=1.991, *p*=0.370. No statistical significance*
Experience in the field of rural tourism	Gp1, n=41: Beginners and less experienced, Mean rank=74.35; Gp2, n=56: Moderately experienced, Mean rank=65.56; Gp3, n=34: Very experienced, Mean rank=56.65; χ^2 (2, n=131)=5.088, *p*=0.079. No statistical significance*

Capacity size	Gp1, n=30: Small capacity, Men rank=68.92; Gp2, n=62: Medium-size capacity, Mean rank=68.50; Gp3, n=39: Large capacity, Mean rank=59.78; χ^2 (2, n=131)=1.872, *p*=0.392. No statistical significance*
Content of the tourist offer	Gp1, n=42: Accommodation only, Mean rank=70.54; Gp2, n=49: Full board, Mean rank=61.28; Gp3, n=40: Full board and other activities, Mean rank=67.03; χ^2 (2, n=131)=1.741, *p*=0.419. No statistical significance*
Importance of marketing for rural tourism development	Gp1, n=23: Not important to slightly important, Mean rank=35.26, MED=3.0; Gp2, n=22: Moderately important, Mean rank=53.82, MED=4.0; Gp3, n=86: Important to extremely important, Mean rank=77.34, MED=5.0; χ2 (2, n=131)=31.378, p=0.000. ***Statistical significance****
Satisfaction with tourist visits and occupancy rate	Gp1, n=9: Dissatisfied to slightly satisfied, Mean rank=63.94; Gp2, n=30: Moderately satisfied, Mean rank=73.87; Gp3, n=92: Satisfied to extremely satisfied, Mean rank=63.64; χ^2 (2, n=131)=2.097, *p*=0.351. No statistical significance*
Satisfaction with the income from rural tourism	Gp1, n=16: Dissatisfied to slightly satisfied, Mean rank=58.41; Gp2, n=60: Moderately satisfied, Mean rank=68.03; Gp3, n=55: Satisfied to extremely satisfied, Mean rank=66.00; χ^2 (2, n=131)=1.017, *p*=0.601. No statistical significance*

* Respondents who declared that more than one person was engaged in operational and management tasks related to rural tourism were excluded from the sample
** The value is significant at the level equaling 0.05
Source: Authors' research

The results show that statistical significance can be seen in only one factor - "Importance of marketing for rural tourism development", which is the only factor to affect the variability of our examined variable (*p*=0.000) (Table 3). Namely, a statistically significant difference in the respondents' attitudes based on values of this variable exists only between the participants who differ according to their perception of the importance of marketing for the development of their RTH. The mean rank and MED are the highest in the third respondent group (marketing is important to extremely important for rural tourism development) compared to the other two groups, which indicates that this group is most aware of the need and importance of DILT (Table 3). The IQR for the examined variable according to the levels of the factors is presented in Figure 2. The IQR results show that the third group of respondents, who evaluate the importance of marketing for RTH management as important to extremely important, provides higher ratings for our examined variable compared to the other two groups. As much as 50% of the mid-position responses of the respondents from the third group evaluated the examined variable in the range from the rating of 4 to the highest rating of 5 (Figure 2).

Figure 2: IQR of the impact of the factor "Importance of marketing for rural tourism development" on the values of the examined continuous variable (Bow plot)



Source: Authors' research

Discussion. Women, middle-aged individuals and those with secondary education are predominantly involved in the management of RTHs in Serbia. The most common RTHs are those with moderate experience in the business, as well as medium-sized ones in terms of accommodation capacity. Regarding the structure of the tourist offer, it can be concluded that there is no typical RTH since approximately the same percentages of respondents provide three different tourist services (accommodation only; accommodation with food; accommodation with food and additional activities).

Individuals who are most engaged in operational and management tasks related to rural tourism on RTHs in Serbia are highly aware of the need and importance of DILT for performing activities in this area.

Testing of *No* has shown that numerous factors identified by the authors in the research as independent variables which could affect the awareness of the need and importance of DILT for performing tasks in rural toursm, have no impact on it. Thus, respondents' views on this issue are not influenced by: the location of the RTH (region); age (respondents' age); or their level of education. At the same time, there is no difference between the attitudes of the respondents who differ in experience in rural tourism, capacity size or content of the tourist ofer. We assumed that DILT would be more positively rated by respondents who were more satisfied with tourist visits and capacity occupancy rate, and by those who were more satisfied with the income from rural tourism (than those who were not satisfied or were less satisfied with these dimensions of business). However, the research did not prove this assumption.

The only factor that has an impact on respondents' perception of the need and importance of DILT is respondents' attitude towards the importance of marketing for rural tourism development. The representatives of RTHs who believe that marketing has a significant role in the development of their business in the field of tourism also believe that acquiring DILT is extremely important and necessary. On the other hand, those who do not think that marketing activities are important for their business operation do not see the acquisition of DILT as a significant requirement.

It can be concluded that our results do not confirm studies of numerous authors who state that the DILT of farmers, rural residents and employees in the tourism and hospitality sector is significantly affected by their economic power, formal education and age (Ilić Kosanović

et al., 2019; Jurjević et al., 2019; Kernecker et al., 2020; Kovljenić et al., 2023; Lazić et al., 2023; Petković et al., 2024; Sheikh & Berenyi, 2023; Zhong et al., 2024). This can be explained by the fact that the studies of the cited authors did not involve the DILT of farmers operating in the sector of rural tourism. In addition, it can be explained by the assumption that the opinions of RTH holders about the significance and importance of possessing digital knowledge differ from the attitudes of farmers who are only engaged in agriculture, as well as from the views of the employees in the tourism and hospitality sector. On the other hand, our findings are in concordance with the research by Khalil-Moghaddam and Khatoon-Abadi (2013), who also do not associate formal education and economic status of rural residents with their DILT, or with the degree of adopting ICTs.

6. Conclusion

On a daily basis we are witnessing the advancement of digitalization in all spheres of economy and society, as well as the speed of the digital transformation of our reality. Digitalization impacts the sector of agriculture and other activities that farmers engage in with the aim of generating additional income, such as rural tourism. In order for digitalization to bring benefits to agricultural households and rural areas, it is requisite for holders and members of RTHs to possess a certain level of DILT or higher level of digital skills.

The authors' research on the sample of 131 RTHs in Serbia shows that holders of RTHs possess a high awareness of the need and importance of DILT for performing tasks in the field of rural tourism. The results of the Kruskal-Wallis test show that respondents' age and education, region (seat of the RTH), as well as the years spent in this business (experience) have no statistically significant impact on this awareness. Similarly, no statistically significant impact has been found for various economic factors, such as: RTH capacity size; content of the tourist offer; degree of respondents' satisfaction with tourist visits and capacity occupancy rates, and degree of respondents' satisfaction with the income from rural tourism. Only one factor has a statistically significant impact on the attitude towards DILT, and it is the respondents' view on the importance of marketing for rural tourism development (p=0.000). Thus, respondents who perceive marketing as an important activity for improving their tourist business operation have a higher awareness of the need and importance of DILT, and vice versa.

A major limitation of the study is the subjectivity of respondents' attitudes, considering it is generally difficult to achieve objectivity in social studies (Shipman, 2014). Nevertheless, the research results enrich the scarce scientific knowledge in the field, and provide practitioners and policymakers in the field of rural development and rural tourism with useful information for planning and implementation of future activities. Further research should be directed towards examining the opinions of supply-side participants in the sector of rural tourism about the following questions: which marketing activities are important and necessary for RTHs; which digital skills are most required for farmers, and which strategies represent the most efficient way to improve digital knowledge and skills of rural residents.

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Conflict of interest

The authors declare no conflict of interest.

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Rural tourism in line with green and technological development: EU perspectives

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Abstract

Purpose – Considering the need to diversify activities in the EU rural areas, as well as significant greenhouse gas emissions from tourism, this paper aims to examine the importance of sustainable rural tourism based on green and smart technologies for the economic development of the EU. **Methodology** – OLS panel regression was used to examine the impact of rural tourism and the factors that contribute to its development on the economic development of the EU. The development of rural tourism compared to urban tourism in the EU was evaluated using the Mann-Whitney U test, while the Friedman test was used to monitor the trend of rural tourism in the period 2012-2023. **Findings** – Rural tourism and the factors that contribute to its development, such as internet users and employment in rural areas, have a positive impact on the economic development of the EU, while greenhouse gas emissions have a negative impact. Rural tourism is more developed than tourism in urban areas, but only in recent years has it reached its pre-pandemic level of development. **Implications** – Important EU strategic documents dealing with rural development, such as the LEADER program, the EU Green Deal, the EU Common Agricultural Policy and the European Strategy should implement the recommendations related to rural tourism development in line with smart, sustainable and inclusive growth.

Keywords: rural tourism, sustainable tourism, green tourism, smart tourism, smart technologies
JEL classification: O18, O33, O52, Q56, Z32

Ruralni turizam u skladu sa zelenim i tehnološkim razvojem: EU perspektive

Sažetak

Svrha – S obzirom na potrebu za diverzifikovanjem delatnosti u ruralnim područjima EU, ali i značajne emisije štetnih gasova od turizma, cilj rada je da ispita značaj održivog ruralnog turizma baziranog na zelenim i pametnim tehnologijama za privredni razvoj EU. **Metodologija** – OLS panel regresija je korišćena za ispitivanje uticaja ruralnog turizma, kao i faktora koji imaju značajnu ulogu u njegovom razvoju, na privredni razvoj EU. Mann-Whitney U test je korišćen za poređenje razvijenosti ruralnog u odnosu na urbani turizam

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EU, dok je Friedman test korišćen za praćenje trenda ruralnog turizma u periodu 2012-2023. **Rezultati** – Ruralni turizam, kao i faktori koji doprinose njegovom razvoju poput internet korisnika i zaposlenosti u ruralnim područjima imaju pozitivan, dok emisija štetnih gasova ima negativan uticaj na privredni razvoj EU. Ruralni turizam je razvijeniji od turizma u urbanim područjima, a tek je poslednjih godina dostigao pretpandemijski nivo razvoja. **Implikacije** – Važna strateška dokumenta EU koja se bave ruralnim razvojem, poput LEADER programa, Evropskog zelenog dogovora, Zajedničke agrarne politike EU i Evropske stretegije treba da primene preporuke koje se odnose na razvoj ruralnog turizma u skladu sa pametnim, održivim i inkluzivnim rastom.

Ključne reči: ruralni turizam, održivi turizam, zeleni turizam, pametni turizam, pametne tehnologije
JEL klasifikacija: O18, O33, O52, Q56, Z32

1. Introduction

Rural areas are increasingly overcoming the paradigm that was related to the exclusive connection with agriculture and are increasingly turning to connections with tourism, vacation, the consumption of local specialties, e-commerce, etc. This leads to the development of integral rural tourism and the increasing connection of tourism with regional and local resources (Saxena et al., 2007). Since the 1970s, rural tourism has been growing in many the EU countries. Now it has entered a new phase of development, which is reflected in the impact on the environment and the destinations of the hosts (Fotiadis et al., 2019). Until 1960, rural areas were mainly associated with agriculture, while now in many rural areas, other activities such as tourism are developing, and agritourism represents one of the main opportunities for rural development (Ahlmeyer & Volgmann, 2023). In the late 1970s and early 1980s, rural tourism started to develop. In the beginning, agritourism dominated, with farmers diversifying their services. In the mid-1990s, the importance of sustainable rural tourism was recognized, and the EU participated in its development through the LEADER program (Lane et al., 2022). The LEADER program in the EU's rural development policy contributes to the promotion of employment, growth, social inclusion and local development in rural areas, as well as opportunities in the green economy and the development of digital technology (Sekulić et al., 2023).

The EU has a program for rural development that supports sustainable rural tourism development. The LEADER program is recognized as the leader for sustainable tourism development, as well as the rural and local development of the EU. It also contributes to the development of entrepreneurial activities in the rural tourism field. All this has led to the decline in agricultural production, the development of rural tourism and an increase in the income of rural households. The EU has established several models of rural development that should lead to a better quality of life for the local population, but also affect the protection of the environment (Apostolopoulos et al., 2020). Remote rural areas of the EU face huge challenges such as internet speed, infrastructure, access to basic services, aging and declining population, household income, etc., while these areas can also contribute with their landscapes and ecosystems to new offers that are in line with the EU Green Deal (Castillo et al., 2024). Given the presence of various cultural and natural resources, as well as traditions, many rural landscapes across Europe have established themselves as places for tourism, vacation and recreation (Joshi et al., 2024).

Tourism plays an important role in the economic, cultural, and social heritage of countries through a positive impact on employment, increasing income, infrastructure, etc. Due to its rapid growth, tourism has become a significant factor in the world GDP. Due to the

preservation of cultural heritage, traditions and ecological dimensions, rural areas play an important role in the development of tourism. The importance of rural areas in the EU is reflected in the size of the territory that occupy (91%) and the population living in these areas (59%) (Muresan et al., 2016). Tourism development in these areas should be based on available resources and sustainable development. Sustainable rural tourism must take into account the economic, ecological and social dimensions. The interest in sustainable tourism development in rural areas is gaining more and more attention because it respects the interests of the environment and limited resources on the earth (An & Alarcón, 2020).

Rural tourism can significantly influence the development of rural areas, agriculture in these areas, and the reduction of rural depopulation. Sustainable development of rural tourism requires appropriate investments and financing of such development. In 1994, The European Commission Directorate-General for Agriculture began implementing measures aimed at the sustainable development of rural tourism. Based on Agenda 2000, the reform of the Common Agricultural Policy (CAP), the EU introduced a rural development policy. Thus, alternative sources of income and forms of employment for farmers were formulated, such as the rural tourism development (Radović et al., 2020).

The subject of this paper is the development of the EU rural tourism in relation to tourism in urban areas. The aim of this paper is to examine the importance of rural tourism development for the economic development of the EU, as well as the factors that have a significant impact on the development of rural tourism.

2. Background

Rural tourism is paying more and more attention to sustainable development, making sustainable rural tourism a current and relevant trend in rural areas. In this regard, there are increasing opportunities that contribute to this, such as the development of green and smart tourism, as well as smart and green technologies.

Sustainable tourism represents the development of tourism that protects the ecological resources of a certain area for future development. Green tourism is fully compatible with sustainable tourism. The Internet is a very important and effective channel for the development of sustainable and green tourism, considering that hotels use this channel to advertise directly. Therefore, information and digital technologies play an important role in the development of green tourism and business efficiency. Also, the gap between the place of advertising in the form of websites, where an insufficient number of hotels publish information on environmental issues, and the end user can be overcome by using the Internet. New digital technologies are increasingly being used in the green tourism development (Misso et al., 2018). Sustainable rural tourism development should be viewed through the development of green tourism, as well as smart technologies and smart tourism.

Green tourism is a component of sustainable development, but it is also a component of rural tourism and regional development. Green tourism can affect rural areas and the economic development (Lagodiienko et al., 2022). Green tourism development in rural areas can contribute through the development of entrepreneurship of the local agricultural population, which, in addition to the ecological dimension, would have a direct impact on the increase of economic and social efficiency (Kalchenko et al., 2021). Europe is the world's leading tourism destination, with Germany, France and Great Britain standing out in terms of tourism's contribution to economic development and employment. Tourism destination in Europe are increasingly turning to green destinations and accommodation, the application of circular economy methods and environmental protection, thereby gaining a competitive advantage over other destinations (Erdiaw-Kwasie et al., 2023). Green tourism development

requires the development of innovative technologies such as IoT (Internet of Things), renewable energy, energy-efficient buildings, green infrastructures, etc. (Chiang et al., 2024).

The digital revolution has led to the emergence of the term smart tourism destination and smart tourism, which are developing by introducing innovations in their operations. The development of information and communication technologies (ICT) has led to a change in the traditional understanding of the destination and brought smart destinations. In this regard, smart tourism destinations are knowledge-based destinations where information can be instantly exchanged using ICT technology platforms, which has an important role in the application of Cloud Computing, Internet of Things (IoT) and other modern technologies in tourism (Jovicic, 2019). E-tourism is one of the examples of the application of technology in the tourism industry. E-tourism represents an innovation in the provision of tourism services that is used in all aspects of travel and life. Smart tourism destinations that use these technologies represent the future in smart tourism (Shafiee et al., 2019). Smart tourism has progressed from E-tourism based on ICT to the establishment of business-client relationships with the help of the Internet of Things (IoT), privacy protection, cloud computing, social media and other available technologies (Hamid et al., 2021).

In order to reduce regional differences and the lack of convergence between central and peripheral regions within the EU, as well as differences in relation to key trading partners, the concept of smart, inclusive and sustainable growth was adopted within the Europe 2020 strategy. Some of the main challenges of smart growth are identifying advantages at the regional level, as well as connecting these policies with green growth, green innovation and mitigating climate change. Europe is a predominantly rural area, which is why the goal is to prioritize smart specialization in European regional policy. Smart EU rural development should be based on innovation, research and development (R&D) and knowledge in these areas. The EU bases its growth on a smart economy based on knowledge, innovation, R&D, entrepreneurial activities, etc. The natural and recreational facilities of these areas are another perspective for development (Naldi et al., 2015).

Sustainable development of rural areas is often neglected. Indicators of smart mobility and tourism have great importance in rural areas, encouraging economic development. Sustainable rural tourism can be improved with the help of green mobility services. Tourism in rural areas contributes to employment and the quality of life of the local population, thereby reducing rural poverty. To ensure the sustainable and smart development of EU rural tourism, the negative impacts on the environmental, social and economic aspects of rural communities should be minimised. In order to achieve a smart and sustainable development of tourism in rural areas, the application of smart technologies such as IoT, AI, cloud technologies, etc. is needed (Hussain et al., 2023). Based on all of this, the following research hypotheses were defined:

H1: Rural tourism has a positive impact on the economic development of the EU.

H2: Tourism in line with the technological development of rural areas has a positive impact on the economic development of the EU.

H3: Rural tourism should be developed in line with green technology and environmental protection.

H4: Rural tourism in the EU is more developed than tourism in urban areas.

3. Materials and methods

The research was conducted for the period 2012-2023 on a sample of the EU-27 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, as well as the EU-27 at total.

Table 1 shows the variables used in the study, along with their abbreviations and description.

Table 1: Variable definition

Label	Definition
GDP	Gross domestic product in million euro
est_rur	Establishments in rural areas (number)
nights_rur	Overnight stays in accommodations in rural areas (number)
internet	Individuals who have ever used the internet in rural areas (percentage of individuals)
emp	Employment rate in rural areas (percentage)
GHG	Greenhouse gases (tonne)
est_urban	Establishments in cities (number)
nights_urban	Overnight stays in accommodations in cities (number)

Source: Eurostat, 2025

The research was conducted in several steps. First, the impact of rural tourism on the economic development of the observed countries was examined by OLS panel regression. Then, the robustness of the set models was examined, replacing the rural variable, i.e. by introducing a new rural variable into research models. The Hausman test was used to determine the random/fixed effects of the research models and in all models it indicated the use of fixed cross-section effects. This part of the research was conducted in the Eviews program.

The regression equations used for the research are (Table 2):

$$GDP_{i,t} = \alpha + \beta_1 est\_rur_{i,t} + \beta_2 internet_{i,t} + \beta_3 GHG_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$GDP_{i,t} = \alpha + \beta_1 nights\_rur_{i,t} + \beta_2 internet_{i,t} + \beta_3 GHG_{i,t} + \varepsilon_{i,t} \quad (2)$$

The robustness of the set models was checked using the following regression equations (Table 2):

$$GDP_{i,t} = \alpha + \beta_1 est\_rur_{i,t} + \beta_2 emp_{i,t} + \beta_3 GHG_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$GDP_{i,t} = \alpha + \beta_1 nights\_rur_{i,t} + \beta_2 emp_{i,t} + \beta_3 GHG_{i,t} + \varepsilon_{i,t} \quad (4)$$

Table 2: Matrix of variables in regression models of influence

Models		Dependent Variables	Rural independent variables				Control variable
			est_rur	nights_rur	internet	emp	GHG
Initiate models	Model 1	GDP	■		■		■
	Model 2	GDP		■	■		■
Robust models	Model 3	GDP	■			■	■
	Model 4	GDP		■		■	■

Source: Author's research

In the second part of the research, the Mann-Whitney U test was used to compare tourism development in rural and urban areas. Kolmogorov-Smirnov and Shapiro-Wilk tests showed that the observed variables do not have a normal distribution, which required the use of a non-parametric test for group comparison.

Based on the same criteria, the non-parametric Friedman test was used to show the movement of establishments and nights in rural areas for measurement on several occasions, i.e. during the observed period, in order to observe the oscillations and movements of these variables during this period. The SPSS program was used for these studies.

4. Results and discussion

Before conducting the regression analysis, the Hausman test was performed to determine the random/fixed effect of the research models.

Table 3: Hausman test

Test Summary	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	Chi-Sq.	Sig.	Chi-Sq.	Sig.	Chi-Sq.	Sig.	Chi-Sq.	Sig.
Cross-section random	1698.29	0.00	2232.86	0.00	1492.93	0.00	1721.07	0.00

Source: Author's research, based on Eurostat, 2025

The Hausman test showed the use of fixed research models (Table 3). OLS panel regression was used to examine the impact of rural tourism, as well as other indicators in rural areas associated with the development of rural tourism, on the economic development of the EU countries.

Table 4: Impact of rural tourism on the economic development the EU

Label	**Dependent variable GDP**			
	Model 1	Model 2	Model 3	Model 4
intercept	2301748. (19.58)***	1925805. (17.22)***	2976621. (15.46)***	2550101. (14.01)***
est_rur	9.70 (2.85)***		13.17 (2.72)***	
nights_rur		0.01 (13.59)***		0.01 (11.21)***
internet	2261.30 (2.28)**	3358.14 (2.96)***		
emp			4053.99 (1.98)**	6039.06 (2.62)***
GHG	-0.01 (-41.68)***	-0.01 (-34.22)***	-0.01 (-36.46)***	-0.01 (-29.46)***
Adjusted R^2	0.99	0.99	0.99	0.99
F-statistic	3787.11***	2998.94***	3283.22***	2501.35***

Note: Beta coefficients in front of parentheses, t-values in parentheses
, * indicate statistical significance at the 5% and 1% levels, respectively
Source: Author's research, based on Eurostat, 2025

Based on all four research models from Table 4, the impact of rural tourism on the economic development of the EU countries was examined. Model 3 and Model 4 were used to check

the robustness of the research by replacing and introducing new variables into the models. All models are statistically significant and in a high percentage describe the reality as measured by Adjusted R^2.

Based on Model 1 and Model 2 from Table 4, it is concluded that establishments and nights in rural areas have a statistically significant and positive impact on the economic development of the EU countries. Internet users in rural areas also has a statistically significant and positive impact, while GHG has a statistically significant and negative impact on the economic development of EU countries.

Establishments and nights in rural areas have a statistically significant and positive impact on the economic development of the EU countries in models 3 and 4, which means that the robustness of the research model has been proven, i.e. that rural tourism has a significant impact on the economic development of the observed EU countries. In these models, employment in rural areas is also positively reflected on economic development, while GHG is again negatively reflected on the economic development of the EU countries.

Rural tourism is of great importance not only for reducing poverty and improving the living standard of the local community, but also for increasing economic development (Liu et al., 2023). Rural tourism can increase employment in rural areas and reduce the depopulation of those areas (López-Sanz et al., 2021). Tourism has an important role in diversifying the rural economy and sustainable development of these regions. The relationship between socio-cultural, economic, ecological and tourism development is significant (Nooripoor et al., 2021). In addition to economic development, rural tourism contributes to the cultural and socio-economic development of local communities and entire regions (Lazović et al., 2024).

Bearing in mind the negative impact of greenhouse emissions on economic development, rural tourism should be developed in line with ecological standards and environmental protection. In this connection, the development of green tourism is becoming more and more current. Green and smart technologies have an important role in sustainable development. Bearing in mind that the CO2 emitted by tourism is not small compared to other sectors, green tourism represents tourist activities that should minimize environmental impact, reduce energy use and greenhouse emissions. Also, smart technologies in information and communication technology (ICT) era, such as wireless sensor networks (WSNs) and internet of things (IoT), influence the development of information networks in accordance with sustainable tourism (Pan et al., 2018). For the development of smart tourism, the problem of Internet access in many rural areas should be overcome, considering the importance of effective Internet access in rural areas (Ruiz-Martínez & Esparcia, 2020). High-speed Internet improves the economic performance of rural areas, as well as overall economic development through improved productivity, jobs and income (Mack et al., 2024). The development of smart tourism and technologies in accordance with Tourism 4.0 contributes to the positive experience of tourists, competitiveness and the efficiency of tourism destination (Gajdošík & Orelová, 2020). The importance of 4G networking in remote areas and the establishment of a tourist information center that would serve to improve travel, accommodation, food, etc. is emphasized (Sun et al., 2024). Accordingly, digital literacy is of particular importance for members of rural tourist households (Paraušić et al., 2025).

For the second and third part of the research, the normality of the variables distribution was first examined (Table 5).

Table 5: Tests of Normality

	Kolmogorov-Smirnov			**Shapiro-Wilk**		
	Statistic	df	Sig.	Statistic	df	Sig.
Establishments	.372	616	.000	.332	616	.000
Nights	.352	616	.000	.368	616	.000
Establishments in rural areas	.353	308	.000	.381	308	.000
Nights in rural areas	.351	308	.000	.366	308	.000

Source: Author's research, based on Eurostat, 2025

Kolmogorov-Smirnov and Shapiro-Wilk tests showed that the observed variables do not have a normal distribution (Table 5). Because of that, the non-parametric techniques for comparing groups (Mann Whitney U test) and repeated measurements (Friedman test) were applied in further research.

Table 6: Tourism development in the EU - rural areas vs. cities

Label	**Establishments**	**Nights**
Rural areas	368.24	337.79
Cities	250.76	329.21
Mann-Whitey U	29590.50***	540.16

Note: Values expressed in Mean Rank
*** indicate statistical significance at the 1% level
Source: Author's research, based on Eurostat, 2025

Table 6 shows that establishments in rural areas are statistically significant and higher than establishments in cities, while nights in rural areas are also higher compared to nights in cities, but this difference is not statistically significant. Certainly, based on the previous comparison, it can be concluded that rural tourism is significantly more developed than urban tourism.

Tourism is a measure of increasing the attractiveness of both rural and urban areas (Pateman, 2011). Tourism leads to the development of both rural and urban areas through the possibility of preservation of cultural heritage, new employment, processing of local products and the preservation of natural resources (Wijijayanti et al., 2020). Given that rural areas cover the majority of the EU territory, as well as that rural tourism is more developed than urban tourism, and that it has an important role in economic development, the EU pays great attention to this sector and its development.

In the last part of the research, the development of rural tourism during the observed time period was examined, for which the Friedman test of repeated measurements was used. Table 7 shows the movement of establishments and nights in rural areas during the observed period 2012-2023. Statistical significance was not recorded for the movement of establishments in rural areas, while it was recorded for nights in rural areas. In the case of establishments in rural areas, no significant deviation of the observed data was recorded during this period, while in the case of nights in rural areas, there is a significant drop in 2020. Observed through this indicator, rural tourism began to recover in 2021, since it has been constantly increasing from year to year, reaching a record amount of 9.85 in 2023, which is even higher than the one year before the Covid pandemic, in 2019, which was 9.81.

Table 7: Development of the EU rural tourism in the period 2012-2023

Year	Establishments in rural areas	Nights in rural areas
2012	8.33	4.08
2013	8.00	4.46
2014	7.67	5.08
2015	4.67	6.35
2016	5.00	8.27
2017	7.33	7.42
2018	5.00	8.69
2019	6.00	9.81
2020	5.67	1.73
2021	5.83	3.62
2022	7.17	8.65
2023	7.33	9.85
Chi-square	4.17	157.41***

Note: Values expressed in Mean Rank
*** indicate statistical significance at the 1% level
Source: Author's research, based on Eurostat, 2025

The number of nights in tourist accommodation in the EU decreased by 51% in 2020 compared to 2019. The accommodation sector in the EU began to recover in 2021. However, the some EU countries have not reached the level of rural tourism development of 2019 (Damian et al., 2024). Tourism has great potential to restore rural businesses and infrastructure that have been severely affected by the pandemic (Maliuta et al., 2021).

5. Conclusion

Bearing in mind that the rural areas of the EU occupy a large part of the territory, as well as that the majority of the population lives in them, the development of these areas is becoming increasingly important, which is channeled through the various EU strategic documents that play a significant role in their development. Therefore, the development of rural tourism and the shift from the exclusive pursuit of agriculture to diversifying activities, employment in tourism and other activities related to it play an increasingly important role in rural areas.

Rural tourism undoubtedly plays a significant role in the economic development of countries. However, considering that the tourism sector is one of the major polluters, and that greenhouse emissions have unwanted consequences for the environment, and economic development itself, the role of sustainable rural tourism has become increasingly important. In this regard, it is understood that rural tourism develops in line with the preservation of the environment and ecological standards, which assigns a significant role to green tourism and technologies. In order to develop sustainable rural tourism, smart technology is increasingly being used, which results in the consistency of smart and green tourism.

Given the significant role of employment in rural areas, as well as the fact that an increasing number of jobs are created within the tourism sector, which affects the improvement of the living standards of the local population, rural tourism has a significant impact on the economic development of the EU, thus proving the first hypothesis of the research. Also, bearing in mind that internet users in rural areas, who serve as the basis for the development of smart technologies in these areas, have a positive impact on the economic development, rural tourism should develop in accordance with technological development, which proves the second hypothesis of the research. In addition, there is a noticeable negative impact of the

greenhouse emissions on the environment and economic development, which is why rural tourism should be harmonized with ecological standards and move in the direction of the development of green tourism based on the natural resources of rural areas, thus proving the third hypothesis of the research. Considering all of the above, as well as the fact that rural tourism is more developed than urban tourism within the EU, thus proving the last hypothesis of the research, special emphasis in future the EU strategic documents should be given to the development of rural tourism in accordance with green and technological development.

The limitations of the research lie in the fact that the influence of developed countries in relation to developing countries was not specifically examined, as well as that no comparison was made with countries outside the EU, which can serve as a recommendation for future research. Also, future research can include an examination of urban tourism, and the EU strategic documents that deal with these issues.

Conflict of interest

The author declares no conflict of interest.

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The impact of digital marketing on customer satisfaction in dental tourism in Serbia

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Abstract

Purpose – The study aims to examine the impact of digital marketing on customer satisfaction and loyalty in dental tourism, focusing on Serbia. Key digital marketing elements analyzed include website quality, social media presence, online reviews, price transparency, and the promotion of additional services, alongside customer satisfaction factors such as trust, engagement, risk perception, and value perception. **Methodology** – The research was conducted through an online survey with 220 respondents who used dental services in Belgrade and its surroundings. The collected data were analyzed using correlation and regression analysis to determine the relationship between digital marketing factors and user satisfaction and loyalty. **Findings** – The results indicate that online reviews and website quality have the most significant positive impact on customer trust and satisfaction, while social media presence and the promotion of additional services have a moderate influence. Price transparency emerged as a crucial factor shaping customer perceptions of dental services. **Implications** – The findings highlight the importance of digital marketing in dental tourism and can help dental clinics develop more effective marketing strategies. Future research could explore the long-term effects of digital marketing and conduct comparative analyses of different dental tourism markets.

Keywords: digital marketing, dental tourism, customer satisfaction, loyalty, online reviews
JEL classification: M31, L83, I11

Uticaj digitalnog marketinga na zadovoljstvo korisnika i održivost dentalnog turizma u Srbiji

Sažetak

Svrha – Ova studija ima za cilj da ispita uticaj digitalnog marketinga na zadovoljstvo i lojalnost korisnika u dentalnom turizmu, sa fokusom na Srbiju. Analizirani su ključni elementi digitalnog marketinga, uključujući kvalitet veb-sajta, prisustvo na društvenim mrežama, onlajn recenzije, transparentnost cena i promociju dodatnih usluga, kao i faktori zadovoljstva korisnika poput poverenja, angažovanosti, percepcije rizika i vrednosti.

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Metodologija – Istraživanje je sprovedeno putem onlajn ankete na uzorku od 220 ispitanika koji su koristili stomatološke usluge u Beogradu i okolini. Prikupljeni podaci analizirani su putem korelacione i regresione analize radi utvrđivanja odnosa između faktora digitalnog marketinga i zadovoljstva i lojalnosti korisnika. **Rezultati** – Rezultati pokazuju da onlajn recenzije i kvalitet veb-sajta imaju najznačajniji pozitivan uticaj na poverenje i zadovoljstvo korisnika, dok prisustvo na društvenim mrežama i promocija dodatnih usluga imaju umeren uticaj. Transparentnost cena se izdvojila kao ključni faktor u oblikovanju percepcije korisnika o stomatološkim uslugama. **Implikacije** – Nalazi ističu značaj digitalnog marketinga u dentalnom turizmu i mogu pomoći stomatološkim ordinacijama u razvoju efikasnijih marketinških strategija. Buduća istraživanja mogu ispitati dugoročne efekte digitalnog marketinga i sprovesti komparativne analize različitih tržišta dentalnog turizma.

Ključne reči: digitalni marketing, dentalni turizam, zadovoljstvo korisnika, lojalnost, online recenzije
JEL klasifikacija: M31, L83, I11

1. Introduction

In the modern era, dental tourism is emerging as a significant segment of medical tourism, combining high-quality dental services with a tourism experience. Countries such as Hungary, Turkey, and Poland are leaders in this field due to their combination of low costs, high-quality healthcare, and well-developed tourism infrastructure. Serbia is a popular destination for dental tourism as it offers high-quality dental services at significantly lower prices compared to other European countries (Jezdović et al., 2021). One of the main challenges is Serbia's insufficient visibility in the international market and its relatively disadvantaged position in comparison to its competitors (Chandu, 2015).

Advanced digital solutions enhance tourism products and services, improve the customer experience, increase productivity, and strengthen the sector's resilience (Lazić et al., 2023). Digital marketing plays a key role in promoting dental tourism, as it enables direct access to target patient groups worldwide via the internet. By utilizing digital tools such as social media, SEO optimization, Google Ads, and email campaigns, dental clinics and organizations in Serbia can effectively promote their services on a global level, raise awareness of service quality, and attract foreign patients (Chandu, 2015; Ilić et al., 2024).

The authors aim to answer how effectively digital marketing can contribute to promoting dental tourism in Serbia and which digital strategies are most successful in attracting foreign patients. Consequently, the focus is also placed on sustainable business practices, which are now essential for any activity (Ilić, 2020).

Sustainable development, as a concept, encompasses three components: economic, social, and environmental. The tourism industry, including all forms of tourism, is closely linked to all three. Economic sustainability implies balancing economies of scale with environmental needs to preserve a healthy ecosystem. In this context, humans and society serve as the link between economic gain and environmental protection (Ilić et al., 2022). Given the nature of dental tourism as a branch of medical tourism, it is evident that all three sustainability components play a crucial and highly significant role.

The paper will begin by outlining the main research objectives and explaining the relevance of the topic. It will then present the research problems, highlight the purpose of the study, and define the hypotheses to be tested. The aim is to analyze the impact of digital marketing on patient satisfaction in dental tourism in Serbia. The next section will focus on defining dental tourism, its global application, key factors influencing patient decisions, and the role

of digital marketing in promoting this sector. Additionally, relevant literature and the theoretical framework supporting the research will be reviewed.

Following that, the methodological approach of the study will be explained in detail, including the sample of respondents, data collection methods, and statistical techniques applied for data analysis. Subsequently, the research results will be presented, with data analysis, correlations, regression, and hypothesis testing. This section will also include a discussion of the obtained results, their interpretation, and comparisons with previous research. Finally, the conclusion will summarize the main findings of the study, discuss the limitations of the research, and offer recommendations for future studies, highlighting the practical implications for dental clinics in Serbia regarding the application of digital marketing in attracting international patients.

2. Background

2.1. Definition and global development of dental tourism

Dental tourism is a specialized branch of medical tourism that involves patients traveling abroad for dental treatments. The primary reasons for choosing dental tourism include significantly lower treatment costs, shorter waiting times, and the opportunity to combine dental procedures with tourist activities (Jaapar et al., 2017). Lower labor costs and a relatively lower cost of living in host countries enable highly competitive dental treatment prices, while still maintaining high-quality services, thus attracting many patients from developed countries (Ancy et al., 2020).

Globalization and freedom of movement have made it easier for patients to travel to countries where dental care is more affordable without compromising service quality. Initially, patients from the U.S. and Canada primarily traveled to Mexico and Costa Rica, while European patients visited Hungary, Poland, and the Czech Republic. With technological advancements, dental tourism has expanded significantly in the 21st century. Digital tools, including social media, forums, and specialized websites, allow patients to quickly find information about foreign dental clinics, read reviews, and compare prices and services. This has increased patient trust and facilitated decision-making regarding traveling abroad for dental treatments (Zoltan & Maggi, 2010).

2.2. Key factors influencing patient decisions and satisfaction

Communication in the patient's language, transparency in treatment details, pricing, and expected results, as well as the availability of pre- and post-treatment consultations are key factors in enhancing patient satisfaction (Kesar & Mikulić, 2017).

Dental tourism is not only a way for patients to reduce dental care costs but has also become an industry that contributes to the economic development of many countries and improves their tourism and healthcare infrastructure. With further advancements in technology, digital marketing, and specialized services, dental tourism is expected to continue growing and becoming even more competitive on a global scale (Zoltan & Maggi, 2010).

2.3. The role and potential of dental tourism in Serbia

In Serbia, dental tourism has significant potential due to the high quality of dental services, competitive pricing, and rich cultural and historical heritage, which attract patients from both the Western Balkans and the countries of Western Europe, Australia, and North America.

The combination of top experts, modern clinics, and tourist attractions makes Serbia a potentially important player in global dental tourism (Milićević, 2013).

Serbia has a well-developed legal framework ensuring patient rights protection, which is particularly important for international patients seeking dental care, as it provides security and trust in the healthcare system. In case of complications or dissatisfaction with results, patients can request additional procedures or refunds, further strengthening their trust in the services provided (Mujović Zornić et al., 2016).

2.4. Digital marketing in the promotion of dental tourism

The success of dental tourism depends on the ability of dental clinics to position themselves in the international market as reliable and affordable destinations. Digital marketing enables them to build a recognizable brand, engage with patients, and promote their services (Mathur et al., 2019). It allows for faster, more direct, and more interactive communication with potential patients (Chaffey & Ellis-Chadwick, 2019). As the internet has become the primary source of information for patients, healthcare institutions have started integrating more advanced digital strategies (Wisetsri et al., 2021).

By utilizing search tracking tools, clinics can target patients who have previously searched for dental services or information on dental procedures (Arni & Laddha, 2017). Dental tourism involves patients from different countries seeking high-quality dental treatments at lower prices than in their home countries, with the internet serving as their main source of information (Nazeli et al., 2023). Clinic w.ebsites often feature blogs with educational content about dental treatments, which help establish the clinic's authority (De Lira & Magalhães, 2018). Positive patient reviews on specialized platforms enhance SEO ranking and build trust (Morić et al., 2024).

Facebook ads allow for precise targeting of patients who have already shown interest in dental treatments or previously searched for related topics (Demonja & Uglješić, 2020). In addition to Google Ads, many clinics utilize other paid platforms such as Instagram Ads, and Bing Ads. These tools provide extensive reach and quick interaction with potential patients, increasing the likelihood of booking consultations and scheduling treatments (Nazeli et al., 2023).

Online consultations via email or video calls enable patients to obtain all necessary information before deciding to travel, making decision-making easier (Arni & Laddha, 2017). Social media requires regular posting and active engagement with followers. Posts featuring treatment results, patient testimonials, and special offers enhance clinic visibility and build trust (Parkin, 2016). Dental tourism clinics can also develop strategic partnerships with local travel agencies to offer comprehensive packages, including dental treatments, accommodation, transportation, sightseeing, and other services, further increasing their attractiveness as a destination (Kamath et al., 2015).

3. Materials and methods

The research presented in this paper included a sample of 220 foreign tourists who used dental tourism services in Serbia between May and September 2024. The respondents primarily visited dental clinics in Belgrade and the surrounding area for dental procedures, allowing for an analysis of the impact of digital marketing on their satisfaction and perception of service quality.

This study tests the following hypotheses:

- H1: There is a statistically significant relationship between digital marketing variables and customer satisfaction variables in dental tourism services.
- H2: There are significant differences in dental service customer satisfaction variables depending on the customer's country of origin.

The first hypothesis investigates the existence of a significant relationship between digital marketing factors (such as website quality, social media engagement, customer reviews, price transparency, and promotion of additional services) and customer satisfaction in dental tourism services. This hypothesis assumes that more effective use of digital marketing can significantly enhance customer satisfaction. The second hypothesis examines whether there are statistically significant differences in customer satisfaction with dental services based on the customer's country of origin. This hypothesis suggests that customers from different countries may have varying perceptions and levels of satisfaction due to cultural and geographical factors, which could influence their decision to use these services.

The application of digital marketing in promoting dental tourism services was analyzed through the following variables: website, social media, customer reviews, price transparency, and the promotion of additional services. Through these variables, customers evaluated the quality of dental clinic websites based on their design, functionality, loading speed, SEO optimization, and intuitive customer interface. They also assessed social media and its role in dental tourism through customer activity and engagement on platforms such as Facebook, Instagram, TikTok, and LinkedIn, including interactions, comments, and content sharing. Respondents evaluated the significance of customer reviews based on ratings and patient comments on well-known platforms like Google, and their influence on trust and the decision to use dental services. The variable of price transparency highlighted the importance of publicly available pricing information, clearly presented price lists, and additional cost policies. The promotion of additional services assessed foreign tourists' perceptions regarding support for extra services, including accommodation offers, collaborations with hotels and apartments, and promotional packages that combine dental services with lodging.

Customer satisfaction with dental services was examined through five variables. Customer trust reflects the level of confidence and assurance in the quality of dental services, the expertise of staff, and adherence to industry standards. Customer engagement assessed patient interaction with clinics through social media, reviews, recommendations, and participation in promotional activities. Perceived risk measured the level of concern regarding service quality, treatment safety, and potential complications, while perceived value reflected customers' assessment of the balance between price and service quality. Service flexibility evaluated the ability to adjust appointment schedules, the availability of emergency interventions, installment payment options, and personalized offers for foreign patients.

The subject of this research is the analysis of the impact of digital marketing on the satisfaction of dental tourism service customers. The research problem lies in identifying key marketing factors that influence trust, engagement, and perceived value of dental services, as well as examining differences in customer satisfaction depending on their country of origin. The aim of the study is to determine the extent to which digital marketing contributes to building customer trust and engagement, and whether there are significant differences between customers from Europe and the United States.

The collected data will be processed using the SPSS IBM Statistics 26 software package. The data analysis will include descriptive statistics, correlation analysis, regression analysis, and an independent samples t-test.

4. Results and discussion

The study included a total of 220 participants who were customers of dental tourism services. Among them, 123 were male (55.9%), and 97 were female (44.1%). Regarding geographic distribution, 134 participants were from Europe (60.9%), while 86 were from the United States (39.1%). A total of 134 respondents from Europe participated in the study. The largest group came from Austria, with 41 respondents (30.6% of the total number of European respondents). Germany was in second place with 38 respondents (28.4%). Switzerland had 20 respondents (14.9%), while France had 18 respondents (13.4%). The smallest group consisted of Sweden, with 17 respondents (12.7%). In terms of age structure, the average age of participants was 35.4 years (M = 35.4, SD = 10.2), with the youngest participant being 18 years old and the oldest 65 years old.

The variables of this study were analysed by use of descriptive statistics. The results are presented in Table 1, which includes the minimum, maximum, and mean values of the variables, as well as the standard deviation.

Table 1: Descriptive statistics of digital marketing variables and dental tourism customer satisfaction variables

Variable	**Mark**	**N**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Cronbach' s alpha**
Website	DM1	220	1	5	4,32	,709	,810
Social media	DM2	220	1	5	3,57	,696	,842
Reviews on platforms	DM3	220	1	5	4,35	,912	,874
Price transparency	DM4	220	1	5	3,67	,691	,793
Promotion of additional services	DM5	220	1	5	3,20	,768	,762
Customer trust	CS1	220	1	5	4,04	,760	,881
Customer engagement	CS2	220	1	5	3,29	,521	,823
Risk perception	CS3	220	1	5	2,06	,917	,779
Value perception	CS4	220	1	5	3,27	,920	,854
Service flexibility	CS5	220	1	5	2,75	,706	,801

Source: Authors' research

For the variable Website (DM1), five items were investigated: website design, website functionality, website loading speed, SEO optimization, and the intuitiveness of the user interface. Each of these items provides a detailed insight into how the clinic's website affects the user experience and information accessibility. The variable Social media (DM2) covered four items: the number of interactions (likes, comments, and shares), user engagement, posting frequency, and patient activity on platforms such as Facebook, Instagram, TikTok, and LinkedIn. The variable Reviews on platforms (DM3) examined three key items: patient ratings, patient comments on platforms such as Google, and their impact on patient trust in service quality. For the variable Price transparency (DM4), four items were analyzed: clarity of treatment prices, price presentation on the website, transparency of additional costs, and the availability of service package prices. Finally, the variable Promotion of additional Services (DM5) covered four items: promotion of airport transfers, accommodation, sightseeing tours, and other additional services offered by the clinics.

The study explored various aspects of customer satisfaction with dental tourism services, focusing on multiple dimensions of the customer experience. For the Customer trust (CS1) variable, five items were examined: trust in service quality, trust in staff expertise, trust in

adherence to industry standards, overall trust in the clinic, and perceptions of service safety. The Customer engagement (CS2) variable was evaluated through four items: the number of interactions on social media, the number of recommendations, participation in promotional activities by the clinic, and activity in comments and reviews. The Risk perception (CS3) variable considered four items: concern about treatment quality, treatment safety, potential complications during treatment, and the overall level of concern regarding service safety. The Value perception (CS4) variable was assessed with three items: the relationship between price and service quality, the overall value of the service relative to its cost, and satisfaction with the price-to-service ratio. Lastly, the Service flexibility (CS5) variable focused on four items: the ability to change appointment times, availability of emergency interventions, installment payment options, and personalized offers for foreign patients.

The descriptive analysis of digital marketing variables and customer satisfaction variables in dental tourism services indicates high ratings for digital marketing channels and slightly lower ratings for customer satisfaction. Reviews on platforms such as Google and Facebook received the highest rating of 4.35, with a standard deviation of 0.912, while the website received a slightly lower rating of 4.32, with a standard deviation of 0.709. The high average values of these variables suggest that customers find the information available on these channels reliable and helpful in the service selection process.

Regarding reviews, the slightly higher standard deviation indicates variability in responses - some respondents rate them highly, while others are more skeptical of their reliability. Among customer satisfaction variables, customer trust received the highest rating, with an average score of 4.04, while risk perception received the lowest rating, with an average of 2.06. The high trust score shows that most respondents have a strong level of confidence in the analyzed services, which may be a key factor in their long-term satisfaction and loyalty. The lowest-rated variable, risk perception, suggests that customers of dental tourism services do not perceive a high level of uncertainty or insecurity. However, the high standard deviation of 0.917 indicates significant differences in respondents' attitudes toward risk. Slightly higher average scores were recorded for value perception (3.27) and customer engagement (3.29), suggesting that respondents are not entirely convinced of the additional value provided by dental services.

The scales used in this study demonstrated satisfactory reliability, as confirmed by the Cronbach's alpha coefficient, which was above 0.75 for all variables, indicating internal consistency and stability of the measurements. The highest reliability was recorded for the customer trust variable ($\alpha = 0.881$), while the lowest was for the promotion of additional services ($\alpha = 0.762$), still within the acceptable range. The scales were developed based on established theoretical constructs and previous research in the field of digital marketing and customer satisfaction, ensuring their validity and relevance.

After defining the mean values and standard deviations of the analyzed variables, their interrelationships were examined. Correlation values of these variables are presented in Table 2.

Table 2: Correlation values between digital marketing variables and customer satisfaction variables in dental tourism

	DM1	**DM2**	**DM3**	**DM4**	**DM5**
CS1	,602**	,759**	,513**	-,096	,236**
CS2	,227**	,474**	,419**	,444**	,242**
CS3	,090	,326**	-,079	-,114	,236**
CS4	,427**	,774**	,459**	,196**	,312**
CS5	,089	,421**	,115	,281**	,168*

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Source: Authors' research

The correlations between digital marketing variables and customer satisfaction in dental tourism services are statistically significant, mostly of strong to moderate intensity, with positive correlations prevailing, while negative correlations are rare and weak. The social media variable (DM2) has shown a statistically significant relationship with the value perception variable (CS4) and customer trust (CS1). These relationships indicate that social media plays a crucial role in building customer trust. The presence and communication of dental clinics on social networks increase the sense of reliability and security among dental service customers. Additionally, information, reviews, and promotional content on social media can significantly influence the perception of quality and the justification of dental service costs.

The customer trust variable (CS1) has shown a statistically significant relationship with the website variable (DM1) and platform reviews (DM3). When the information on the website is clearly presented, including details about services, prices, certifications, and previous patient experiences, customers are more likely to trust the reliability of dental institutions. Furthermore, a professional design, ease of navigation, and the presence of contact options for communication can further enhance customer trust. Customers often rely on reviews as an objective source of information, especially when making decisions about choosing a dental clinic for dental tourism. A high number of positive reviews, ratings, and comments can reduce doubts and increase the sense of security among potential customers, while negative reviews can have the opposite effect.

The weakest correlation was found between the risk perception variable (CS3) and the transparency of prices (DM4), platform reviews (DM3), and website (DM1). These correlations are of low intensity and are not statistically significant, indicating that dental service customers make decisions based on other factors, such as recommendations or previous experiences, rather than solely on clearly defined prices. Moreover, customers may still feel a certain level of uncertainty, even if the reviews are positive. They do not perceive information on the website as a key factor in assessing the adaptability of services to their needs. A weak negative correlation, which is not significant, was found between the customer trust variable (CS1) and price transparency (DM4), further suggesting that customers may have confidence in dental services regardless of how clearly prices are displayed.

Based on the established statistically significant relationships, a regression model was developed to examine the influence of individual independent digital marketing variables on the dependent variables of customer satisfaction in dental services. The results of the regression analysis are presented in Table 3.

Table 3: Regression model of the impact of independent digital marketing variables on dependent variables of customer satisfaction in dental tourism services (only statistically significant variables are shown)

Dependent	Independent	β	t	Sig.	R^2	F	Sig.
CS1	DM1	,138	3,372	,001	,835	217,221	,000
	DM2	,738	16,091	,000			
	DM3	,450	14,412	,000			
	DM4	-,285	-8,648	,000			
	DM5	-,279	-7,295	,000			
CS2	DM1	-,331	-4,641	,000	,501	42,972	,000
	DM2	,784	9,815	,000			
	DM3	,183	3,357	,001			
	DM4	,449	7,815	,000			
	DM5	-,296	-4,440	,000			
CS3	DM1	-,290	-3,215	,002	,200	10,712	,000
	DM2	,489	4,837	,000			
CS4	DM1	-,314	-6,481	,000	,769	142,548	,000
	DM2	1,111	20,460	,000			
	DM3	,256	6,905	,000			
	DM4	,139	3,563	,000			
	DM5	-,328	-7,233	,000			
CS5	DM1	-,499	-6,401	,000	,403	28,884	,000
	DM2	,936	10,713	,000			
	DM4	,409	6,507	,000			
	DM5	-,290	-3,982	,000			

Source: Authors' research

The results of the regression analysis presented in Table 3 show that different dimensions of digital marketing have a significant impact on customer satisfaction in dental tourism. In all models, social media (DM2) has the most pronounced positive effect on all dependent satisfaction variables, with its effect particularly strong on perceived value (CS4, $\beta = 1.111$, $p < 0.01$) and customer engagement (CS2, $\beta = 0.784$, $p < 0.01$). This suggests that presence and interaction on social media significantly contribute to building trust, customer engagement, and perceived value of dental services.

On the other hand, the website (DM1) has a dual effect - while it positively influences customer trust (CS1, $\beta = 0.138$, $p < 0.01$), it simultaneously negatively impacts engagement (CS2, $\beta = -0.331$, $p < 0.01$) and perception of service flexibility (CS5, $\beta = -0.499$, $p < 0.01$). This result may indicate that static information on the website is not sufficient to encourage customer engagement and may seem rigid in terms of service adaptability.

Reviews on platforms (DM3) also play a significant role, especially in strengthening customer trust (CS1, $\beta = 0.450$, $p < 0.01$) and perceived service value (CS4, $\beta = 0.256$, $p < 0.01$). This means that positive reviews and experiences from other patients increase the sense of security and justification for investing in dental services.

Price transparency (DM4) shows mixed effects - while it has a positive impact on perceived value (CS4, $\beta = 0.139$, $p < 0.01$) and service flexibility (CS5, $\beta = 0.409$, $p < 0.01$), it negatively affects customer trust (CS1, $\beta = -0.285$, $p < 0.01$). This may suggest that an excessive focus on prices can create doubt among customers instead of providing them with confidence.

Promotion of additional services (DM5) has a predominantly negative effect, especially on customer trust (CS1, $\beta = -0.279$, $p < 0.01$) and perceived value (CS4, $\beta = -0.328$, $p < 0.01$). The obtained result suggests that aggressive promotional strategies may raise suspicion among customers and reduce their perception of service value.

By analyzing the coefficient of determination (R^2), it is evident that digital marketing explains the greatest variability in customer trust (CS1, $R^2 = 0.835$) and perceived service value (CS4, $R^2 = 0.769$). This indicates that dental tourism customers are most sensitive to digital marketing strategies when it comes to their trust and perception of service value. Conversely, perceived risk (CS3, $R^2 = 0.200$) has the least explained variance, meaning that it suffers the influence of other factors not included in the model.

The independent samples test examined customer satisfaction variables based on their country of origin. Since the study involves foreign tourists using dental tourism services in Serbia, Table 4 presents their satisfaction variables based on whether they come from Europe or the USA.

Table 4: Independent samples test for customer satisfaction in dental services based on country of origin (only statistically significant variables are presented)

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% CI of Diff	
		F	**Sig**	**t**	**Df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**
CS1	EV	23,47	,000	-6,179	218	,000	-,596	,096	-,79	-,41
	UV			-6,525	217,17	,000	-,596	,091	-,78	-,41
CS2	EV	200,76	,000	-7,774	218	,000	-,492	,063	-,62	-,37
	UV			-8,413	216,29	,000	-,492	,059	-,61	-,38
CS4	EV	2,25	,135	-9,611	218	,000	-1,018	,106	-1,23	-,81
	UV			-9,641	193,69	,000	-1,018	,106	-1,23	-,81
CS5	EV	,054	,816	-3,066	218	,002	-,291	,095	-,48	-,10
	UV			-3,121	202,68	,002	-,291	,093	-,48	-,10

(EV – Equal variances; UV – Unequal variances; 95% CI of Diff - 95% – Confidence Interval of the Difference)
Source: Authors' research

The independent samples test indicates significant differences in dental service customer satisfaction between patients from Europe and those from the United States. Out of the five analyzed variables related to customer satisfaction with dental tourism services, four variables - customer trust (CS1), customer engagement (CS2), perceived value (CS4), and service flexibility (CS5) - showed statistically significant differences between these two groups of patients.

Patients from Europe exhibit significantly higher trust in dental services compared to patients from the United States ($t = -6.179$, $p < 0.01$). Given the negative mean difference (-0.596), it can be concluded that customers from the United States express a lower level of trust. When analyzing the effect size, the eta-squared value is 0.164, indicating a moderately strong effect of the difference between European and American patients regarding trust in dental services.

Customer engagement also shows a significant difference between the groups, with patients from Europe being significantly more engaged than those from the United States ($t = -7.774$, $p < 0.01$). The difference in mean values is -0.492, meaning that patients from the United States demonstrate a lower level of involvement in dental services compared to European patients. The eta-squared value for this variable is 0.247, suggesting a strong effect of the difference between groups in terms of customer engagement.

The perceived value of dental services exhibits the greatest difference between groups, with European patients rating the value of services significantly higher than American patients ($t = -9.611$, $p < 0.01$, Mean Difference = -1.018). This result suggests that European patients better evaluate the price-to-quality ratio of dental services. The eta-squared value is 0.299, representing the strongest effect among the analyzed variables, indicating that patient origin is a key factor in the perception of dental service value.

The service flexibility variable also shows a statistically significant difference between groups, with European patients perceiving services as more flexible than patients from the United States ($t = -3.066$, $p < 0.01$, Mean Difference = -0.291). However, the eta-squared value for this variable is 0.043, indicating a weak effect of the difference between groups, suggesting that patient origin has a lesser impact on the perception of service flexibility compared to the other analyzed variables.

The greatest effect of the difference between European and the US patients was observed in the perception of service value, while the smallest effect was found in service flexibility. Trust in providers and customer engagement also showed significant differences, with European patients expressing higher levels of trust and engagement in dental services compared to the US patients.

5. Conclusion

Dental tourism in Serbia is becoming an increasingly significant segment of the healthcare and economic sectors, attracting a large number of foreign patients due to the high quality of dental services and competitive prices compared to European countries. Belgrade and the surrounding cities serve as major hubs for dental tourism, thanks to modern clinics, skilled professionals, and well-developed infrastructure.

5.1. Main findings of research

The results of the study confirm the significant influence of digital marketing on customer satisfaction in dental tourism. The correlation analysis revealed that digital channels such as social media, websites, and online reviews play a crucial role in building trust and perceived value of dental services. Social media emerged as the most impactful channel, as it facilitates direct interaction with potential customers, thereby strengthening their trust and engagement. Conversely, while websites are essential for informing customers, they showed a negative impact on customer engagement and perceived service flexibility. This highlights the need for a more dynamic and interactive approach in their design to improve customer experience.

The regression model analysis supports these findings, showing that digital marketing primarily explains the variability in customer trust and perceived value. Price transparency demonstrated mixed effects - while it positively affects the perception of value, it may simultaneously decrease customer trust. These results highlight the importance of striking a balance when communicating service pricing and value.

Regarding the origin of customers, the independent samples test revealed that European patients exhibited significantly higher levels of trust, engagement, and perceived value

compared to those from the United States. This suggests that US customers may be more skeptical about dental services abroad, while European patients tend to have higher levels of trust, likely due to their greater exposure to dental tourism.

The obtained results confirm H1, as all analyzed digital marketing variables demonstrated statistically significant correlations with customer satisfaction variables. Social media had the most pronounced positive effect on customer trust and perceived value, while platform reviews also played a crucial role in enhancing customers' sense of security. Hypothesis H2 was also confirmed, as independent sample tests showed statistically significant differences between patients from Europe and the United States. The largest difference was observed in the perception of service value, while trust and engagement were also significantly higher among European patients.

5.2. Limitations of the research

One limitation of this research is its focus on short-term customer satisfaction, without examining the long-term impact of digital marketing on patient loyalty. The study does not track how the digital marketing efforts influence customer behavior and satisfaction over extended periods, which would provide a more comprehensive understanding of customer retention.

Additionally, the study's scope is limited to dental tourism in Serbia, and while the findings are insightful for this context, they may not fully capture the global landscape of dental tourism. Variations in digital marketing strategies and customer behavior may differ across different countries and regions, and these differences should be explored in future studies to ensure broader applicability.

5.3. Directions for future research

Future research should address the limitations of this study by focusing on long-term customer loyalty and satisfaction in dental tourism. An extended analysis would help to understand how digital marketing influences patient loyalty over time, providing insights into the sustainability of digital strategies in maintaining customer relationships.

Furthermore, future studies could explore additional factors that may influence customer trust and perceived value, such as influencer recommendations, personalized digital content, and the use of artificial intelligence in communication with potential customers. Investigating these factors could further enhance digital marketing strategies and improve the competitive advantage of dental institutions targeting international patients.

Expanding the research to include various international markets, particularly other countries in Europe, Asia, and Latin America, could help develop a more comprehensive understanding of how digital marketing strategies differ across regions. This would allow for more generalizable conclusions and provide dental institutions with valuable insights to tailor their digital marketing efforts to specific regional needs.

Lastly, exploring the impact of digital marketing on other aspects of dental tourism, such as pricing, treatment quality, and overall customer experience, could provide a deeper understanding of the factors driving patient satisfaction and loyalty, further contributing to the growth of the dental tourism industry.

Conflict of interest

The authors declare no conflict of interest.

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A model for preparing manuscripts for submission to the journal Hotel and Tourism Management

Title of the paper in English

Name Surname[1*], Name Surname[2], Name Surname[3]

[1] Institution
[2] Institution
[3] Institution

Abstract

This document presents a model for preparing the camera-ready manuscripts to be submitted for publishing in the journal Hotel and Tourism Management. The abstract briefly summarizes the article, at the same time enabling a reader to assess its relevance. All submissions **must** include a **structured abstract**. These four sub-headings and their accompanying explanations must be included: **Purpose** – This is where you explain 'why' you undertook this study and what is the main goal of the research. **Methodology** – This is 'how' you did it. **Findings** – Here you can explain 'what' you found during your study. **Implications** – Here you explain what are the implications of the study to theory and practice.

The abstract in English should be between **150 and 200** words long.

Keywords: 4-6 keywords
JEL classification: 10pt (http://www.aeaweb.org/jel/jel_class_system.php)

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Sažetak

Ovaj dokument predstavlja obrazac za formatiranje radova tako da izgledaju kao da su već spremni za štampu. Sažetak predstavlja kratak informativni prikaz sadržaja članka koji čitaocu treba da omogući brzu i tačnu ocenu njegove relevantnosti. Radovi **moraju** da sadrže **strukturirani sažetak**. Naredna četiri podnaslova i njihova prateća objašnjenja moraju biti uključeni: **Svrha** – Ovde objašnjavate „zašto" ste sproveli istraživanje i koji je glavni cilj rada. **Metodologija** – Ovde objašnjavate kako ste to uradili. **Rezultati** – Ovde možete objasniti „šta" ste otkrili tokom istraživanja. **Implikacije** – Ovde objašnjavate koje su implikacije studije na teoriju i praksu.

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Ključne reči: 4-6 ključnih reči
JEL klasifikacija: 10pt (http://www.aeaweb.org/jel/jel_class_system.php)

* Corresponding author: e-mail address

1. Introduction

Papers should be written **in English** using Microsoft Word for Windows. The paper should be between **10** and **15** full pages long including the figures, tables, references list and appendices. The page should be formatted as **B5 (JIS)**. Allow **20mm** for the bottom and top margins and **25mm** for the left and right margins on a page. The line spacing within a paragraph is single whereas the spacing between two paragraphs is **6pt**. The text should be written using **Times New Roman** font. The maximum number of authors per paper is **three**, however, the Editor-in-Chief has an exclusive right to approve the submissions with four authors per paper in exceptional situations.

2. Background

The title page should contain the Title of paper in English (14pt). Names of authors, institutional affiliation and e-mail addresses should be typed as shown at the previous page. After the affiliation of the last author, leave an empty row followed by an abstract (10pt). Keywords should follow the abstract. Below the keywords, the title of paper and the abstract are to be given in Serbian.

For numbered first-level subtitles use a bold font of 12pt whereas a bold font of 10pt is used for second-level subtitles. The text and the references list should be written using the font size 10pt.

Author(s) is(are) encouraged to propose the **hypotheses** or **research questions** in the line with the aim and type of conducted research.

3. Materials and methods

Materials and methods section should provide a reader with sufficient details and argue all the necessary aspects in order to allow other researchers to replicate the research and build the published results.

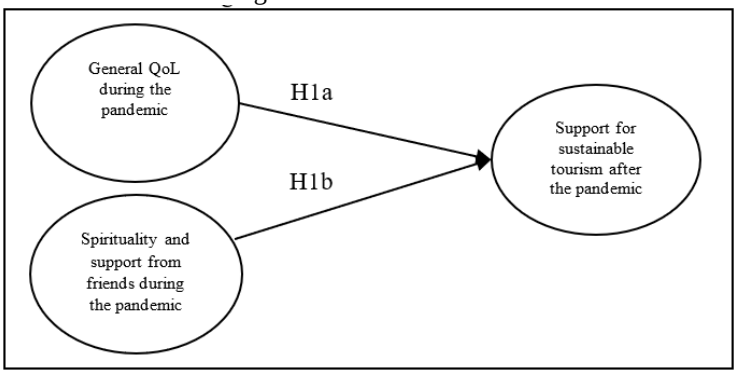
4. Results and discussion

The results obtained in the research should be described in this section. The discussion should highlight the main findings.

Figures, tables and equations

All illustrations whether diagrams, photographs or charts are referred to as Figures. The name and number of figures should be centered on the line above a figure.

Figure 1: Research model



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The equations are written using Microsoft Word (MathType); they are consecutively numbered and centered.

$$\mathrm{PVo} = \frac{\mathrm{FVn}}{(1+\mathrm{i})^{\mathrm{n}}} \tag{1}$$

The name and number of tables should be centered above the table.

Table 1: Results of multiple regression analysis

Variable	ß	T	Sig.	VIF
Textual comments	0.609	14.071	0.000*	1.000
Photos	0.484	11.172	0.000*	1.000
Rating	0.152	3.513	0.001*	1.000

* The value is significant at the level equaling 0.05
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If the study findings were presented graphically or in a table, author(s) is(are) encouraged to state the source below the figure or table in the following form: **Author's research** (single-authored paper) or **Authors' research** (co-authored paper).

5. Conclusion

The conclusion summarizes the results achieved during the research, along with the **limitations of the conducted research** and **future research recommendations**.

Acknowledgement

For papers that came as a result of the project or programme, the title and number of the project, i.e. programme, and the name of the institution supporting the project would be appreciated. If persons other than authors were involved in important aspects of the preparation of the manuscript, their contribution should be acknowledged. If the paper was previously presented at a scientific conference (with the same or similar title), author(s)

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Conflict of interest

The author(s) declare no conflict of interest.

References

The reference list should not contain sources which were not used in the paper. Try to use the most recent references and most of them should be from scientific journals. **Following the acceptance of the paper**, all the cited sources **should be hyperlinked to the corresponding references in the bibliography** (e.g.: Harish, 2008; Luque-Martinez et al., 2007; Tew & Barbieri, 2012). **Use the initials of the first author of the submitted paper together with the first author's surname and the year of publication of the cited paper as a bookmark** (e.g.: ML_Harish_2008; ML_Luque_Martinez_et_al_2007; ML_Tew_Barbieri_2012) **(video instructions)**.

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When citing an author in the text, if the author and the original words are mentioned, the year of publication of the cited text should be given in parentheses after the author's name, whereas the number of the cited page should follow the last sentence of the citation, e.g. according to Đurković (2007), "the cited text" (p. 10) **(use of curved quotation marks (" ") is mandatory)**. When the author is not mentioned in the sentence, his surname, the publishing year and the cited page number should be given in parentheses at the end of a sentence. When paraphrasing or summarizing, the page number is not necessary (Đurković, 2007). Citations of two or more references of the same author published in the same year should be stated in the following way: (Harish, 2008a; Harish, 2008b). If there are two authors of the cited text, surnames of both authors should be given in the following way (Tew & Barbieri, 2012). Citations of references in the text to papers of three or more authors should be stated as follows: (Luque-Martinez et al., 2007). When citing the resource without pagination (e.g. electronic resources), the author's surname and the publishing year should be given. The author being a corporation or an organization, name of the organization/corporation and the publishing year should be provided (Ministry of Finance and Economy of the Republic of Serbia, 2013). If you refer to multiple sources in the same sentence, **list them alphabetically** (Harish, 2008; Luque-Martinez et al., 2007; Tew & Barbieri, 2012).

All **references** should be given at the end of the text in an alphabetical order. Authors should note that all references must be provided in the original language, while the title of the references that have not been published in the English language **should be translated** and provided after the original title, in square brackets. **Indicate the titles of publications in lowercase style**. Use of the **DOI** is highly recommended for articles.

There follow the examples of APA style for citing different types of text (a book, a paper published in a journal, a paper published in proceedings, electronic resources, etc.).

One-author book
E.g.: Hrabovski Tomić, E. (2009). *Destinacije zdravstvenog turizma [Medical tourism destinations]*. Novi Sad, Srbija: Prometej.

A multiple-author book
If there are more authors, they are all named. Before the name of the last author '&' is used. When there are more than seven authors, the names of the first six are given and the name of the last author is preceded by '…'.
E.g.: Barrows, C. W., & Powers, T. (2009). *Introduction to the hospitality industry* (7th ed.). Hoboken, New Jersey: John Wiley&Sons, Inc.

A book, translation
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If a book is an anthology, editor is considered to be the author of the book. In such a case, his or her name is followed by (Ed.). If there is more than one editor, then use (Eds.).
E.g.: Đurković, M. (Ed.) (2007). *Srbija 2000-2006: Država, društvo, privreda [Serbia 2000-2006: State, society, economy]*. Beograd, Srbija: Institut za evropske studije.

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E.g.: Feret, K. (2011). Serbia and Poland on map of the global air cargo shipment. In V. Babić (Ed.), *Contemporary Issues in Economics, Business and Management - EBM 2010* (pp. 3-16). Kragujevac, Serbia: Faculty of Economics University of Kragujevac.

One-author paper published in a journal
E.g.: Harish, R. (2008). Brand architecture and its application in strategic marketing. *The Icfai University Journal of Brand Management, 7*(2), 39–51.

Two-author paper published in a journal
If the cited paper is given a **DOI number**, it **should also be included as a link**.
E.g.: Tew, C., & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management*, *33*(6), 215–224. https://doi.org/10.1016/j.tourman.2011.02.005

A paper with more than two authors published in a journal
E.g.: Luque-Martinez, T., Castaneda-Garcia, J. A., Frias-Jamilena, D. M., Munoz-Leiva, F., & Rodriguez-Molina, M. A. (2007). Determinants of the use of the Internet as a tourist information source. *The Service Industries Journal*, *27*(7), 881–891. https://doi.org/10.1080/02642060701570586

An article with a known author
E.g.: Mišić, M. (2012, February 1). Ju-es stil smanjio gubitke [US steel has cut losses]. *Politika*, p. 11.

An article with no author given
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