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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

Jelena Jevtić^{1*}, Dražen Marić², Ksenija Leković²

¹ Academy of Professional Studies Šabac, Šabac, Serbia

² University of Novi Sad, Faculty of Economics, Subotica, Serbia

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

* Corresponding author: jevticj.vts@gmail.com



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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 [Kirtıl 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 ([Kirtıl & 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.

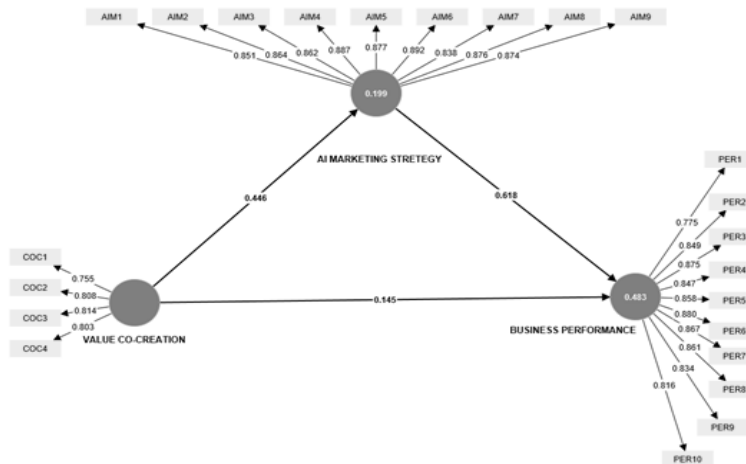
Table 2: Descriptive statistics for observed variables

| | 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

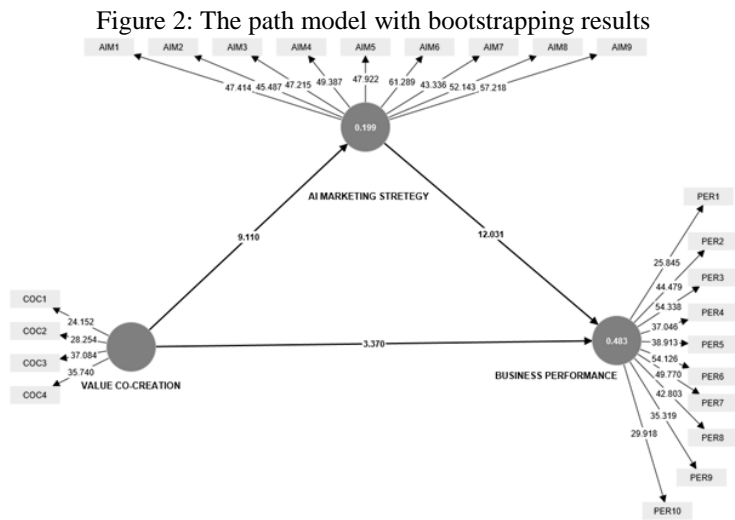
Table 10: Statistical significance testing - direct and specific (mediator) indirect effect

| | 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 ($\beta=0.618$, $T=12.031$, $p=0.000$).
- 2 – There is a significant and positive correlation between value co-creation and AI-based marketing strategy ($\beta=0.446$, $T=9.110$, $p=0.000$).
- 3 - There is a significant and positive correlation between value co-creation and business performance ($\beta=0.145$, $T=3.370$, $p=0.001$).
- 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 ($\beta=0.276$, $T=8.322$, $p=0.000$), and indicates mediation.



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. <p style="text-align: center;">1 2 3 4 5</p> 2. Our clients share their service experience with us. <p style="text-align: center;">1 2 3 4 5</p> 3. All employees are familiar with the agency's long-term plans regarding service provision. <p style="text-align: center;">1 2 3 4 5</p> 4. The travel agency I work in deals with the problems that arise from relations with service users. <p style="text-align: center;">1 2 3 4 5</p> |
| 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. <p style="text-align: center;">1 2 3 4 5</p> 2. The travel agency I work in deals with public relations management. <p style="text-align: center;">1 2 3 4 5</p> 3. The travel agency I work in monitors all communication channels as to maintain relations with service users. <p style="text-align: center;">1 2 3 4 5</p> 4. The travel agency I work in monitors the service users' decision-making process. <p style="text-align: center;">1 2 3 4 5</p> 5. The travel agency I work in has a clearly defined pricing strategy. <p style="text-align: center;">1 2 3 4 5</p> 6. The travel agency I work in monitors the service users' decision-making process. <p style="text-align: center;">1 2 3 4 5</p> 7. The travel agency I work in conducts marketing research. <p style="text-align: center;">1 2 3 4 5</p> 8. The travel agency I work in maintains interaction with the service users. <p style="text-align: center;">1 2 3 4 5</p> 9. The travel agency I work in receives feedback from the service users. <p style="text-align: center;">1 2 3 4 5</p> |
| Business performance (1 - I do not agree, 5 - I completely agree) |
| 1. The travel agency I work in has more employees than last year. <p style="text-align: center;">1 2 3 4 5</p> 2. The travel agency I work in has a larger market share than last year. <p style="text-align: center;">1 2 3 4 5</p> |

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