

POSREDNIČKA ULOGA VEŠTAČKE INTELIGENCIJE U MOTIVACIJI I UČINKU ZAPOSLENIH

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Apstrakt

Cilj istraživanja bio je da se ispituju relacije između motivacije i učinka zaposlenih, kao i posredni efekat veštačke inteligencije između sistema motivacije i učinka zaposlenih u turizmu. Glavno istraživačko pitanje odnosi se na utvrđivanje relacija koje motivacija ima na učinak zaposlenih u turizmu i uloge koje veštačka inteligencija ima u ovom odnosu. Empirijsko istraživanje je sprovedeno na uzorku od 202 zaposlena u turizmu i ugostiteljstvu u Republici Srbiji u periodu od maja do avgusta 2023. godine putem elektronskog upitnika. Predloženi odnosi su testirani PLS-SEM metodom primenom SmartPLS softvera. Istraživanja su ukazala da postoji direktan pozitivan efekat motivacije na primenu veštačke inteligencije i učinak zaposlenih. Primena veštačke inteligencije ima indirektan uticaj na odnos motivacije i učinka zaposlenih u organizacijama u turizmu i ugostiteljstvu. Adekvatan pristup motivaciji od strane organizacije i jačanje sposobnosti u pogledu AI rezultiraće većim učinkom zaposlenih.

Ključne reči: motivacija, učinak, veštačka inteligencija, turizam, ugostiteljstvo

JEL: M12, O33, Z3

Uvod

Kako ističe Öztirak (2023) veštačka inteligencija (AI) je na čelu digitalne transformacije i utiče na globalnu ekonomiju, poslovanje i društvo. Pojava ove vrste napredne tehnologije stvorila je nove mogućnosti organizacijama u sektorima turizma i hotelijerstva. U savremenim uslovima, sistemi za automatizaciju usluga su ubrzali zadatke koje tradicionalno sprovode zaposleni na prvoj liniji, kao što su registracija gostiju (prijava/odjava), posluga u sobu,

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barmen, chat botovi i virtuelna glasovna pomoć (Ivanov, Webster, 2017). Pojava ove vrste napredne tehnologije omogućila je zaposlenima u turizmu i ugostiteljstvu da koriste veštačku inteligenciju i rešenja za automatizaciju za stvaranje personalizovanijeg i nezaboravnog iskustva za smeštaj gostiju, a istovremeno redukuju troškove. Tekući tehnološki razvoj, veštačka inteligencija, automatizacija i robotika prema autorima Li, Bonn i Ye (2019) imaju značajan uticaj na profile radnih mesta, sate rada, odnose zaposlenih i menadžera, učinke i modele motivacije i nagrađivanja. Prema Ganta (2014) učinak predstavlja kombinaciju sposobnosti i motivacije zaposlenih u turizmu i ugostiteljstvu. Organizacije u ovom dinamičnom okruženju konstantno pokušavaju da motivišu svoje zaposlene kako bi postigli što bolje performanse. Cilj ovog istraživanja je ispitivanje relacija između motivacije i učinka zaposlenih, kao i posrednog efekta veštačke inteligencije u odnosu između motivacije i učinka zaposlenih u turizmu i ugostiteljstvu. Predmet istraživanja je utvrđivanje efekta koji motivacija prouzrokuje na učinak zaposlenih i uloge veštačke inteligencije u pomenutoj relaciji.

Pregled literature

Motivacija je složen proces heterogene prirode u kom organizacije podstiču zaposlene da deluju u pravcu postizanja poslovnih ciljeva. Autori Shahzadi i ostali (2014) navode da se motivacija zaposlenih tumačiti kao odraz nivoa energije, posvećenosti i kreativnosti koja je potrebna zaposlenima u obavljanju radnih zadataka. Prema Prahin i Katavić (2021) i Jain, Gupta i Bindal (2019) motivacija je proces u kome organizacija inspiriše na rad zaposlenog kroz nagrade u skladu sa ciljevima koje želi postići. Roslon (2020) ističe da dobro organizovan motivacioni sistem i adekvatan izbor motivatora izazivaju poželjno ponašanje kod zaposlenih sa stanovišta poslodavca i na taj način ostvaruju odlučujuću ulogu u uspehu organizacije.

Sektor turizma i hotelijerstva je radno intenzivan i ljudski resursi su značajan i odlučujući faktor za njegovu stabilnost. Kompanije nastoje pridobiti i zadržati što kvalitetnije ljudske resurse (Prahin, Katavić, 2021). Oslanjanje na ljudske resurse za pravilno funkcionisanje i rast uslužnih delatnosti, zahteva efikasnu praksu radne snage kako bi zaposleni obavljali posao na optimalnom nivou, čime se omogućava da sektor ostane održiv u globalnom okruženju koje se brzo menja (Zopiatis et al., 2014). Krajnji cilj upravljanja organizacijom jesu zadovoljni zaposleni koji ostvaruju najbolji učinak. Konkretno, ostvarivanje što veće produktivnosti zaposlenih kao i smanjenje fluktuacije kreativnih i kvalitetnih ljudi je najbolji učinak (Sekeruš et al., 2019). Autori Ramos-Villagrasa et al. (2019) ističu da radni učinak predstavlja krajnji kriterijum za menadžment ljudskih resursa. Radni učinak se procenjuje na osnovu rezultata rada koji su određeni standardima u poslovanju (Sekeruš et al., 2019). Autori Shahzadi et al. (2014) u svom istraživanju zaključuju da motivacija zaposlenih ima značajan i pozitivan

odnos sa učinkom zaposlenih. U istraživanju autora Shahzadi i ostali (2014) otkrivaju da na učinak zaposlenih direktno utiču unutrašnje nagrade. Iako su istraživanja pokazala da postoji pozitivna korelacija između motivacije zaposlenih i radnog učinka, još uvek nije dovoljno jasno koji faktori motivacije u kolikoj meri doprinose uspešnosti jedne organizacije (Prahin, Katavić, 2021). Na osnovu pregleda literature iz oblasti motivacije i učinka zaposlenih u turizmu i ugostiteljstvu postavlja se sledeća hipoteza:

H1: Motivacija pozitivno i statistički značajno utiče na učinak zaposlenih u organizacijama u turizmu i ugostiteljstvu

Veštačka inteligencija se u literaturi poistovećuje sa mašinama koje pokazuju aspekte ljudskog uma (Huang, Rust, 2018; Longoni et al., 2020; Enholm et al., 2022; Haleem et al., 2022). Za razliku od ranijih proizvodnih ili informacionih tehnologija AI može da uči iz podataka i ažurira ih bez dodatne ljudske intervencije (Huang, Rust, 2018). Prema Nuseir i El Refae (2022) veštačka inteligencija (AI) je postala značajan faktor za unapređenje poslovnih sposobnosti koje dovode do poboljšanja poslovnih performansi. AI ima sposobnost da poboljša poslovne procese, performanse uslužnih zadataka koji vode ka visokom organizacionom učinku (Collins et al., 2021; Vlačić et al., 2021). Simulira ljudsku inteligenciju u mašinama, štedeći vreme i novac u poslovnim transakcijama (Haleem et al., 2022).

Prema Verma et al. (2021) automatizacija procesa usluga sa veštačkom inteligencijom (AI) nudi dodatnu mogućnost za poboljšanje organizacionih performansi i produktivnosti. Po Velojić et al. (2021) ugradnjom veštačke inteligencije (AI) u sistem dolazi do poboljšavanja kvaliteta samog sistema i uštede vremena i troškova. Na osnovama ovih navoda formirana je druga hipoteza:

H2: Motivacija pozitivno i statistički značajno utiče na učinak zaposlenih posredstvom veštačke inteligencije (AI) u organizacijama u turizmu i ugostiteljstvu.

Metodologija

2.1 Upitnik

Tokom procesa istraživanja relacija između motivacije zaposlenih, veštačke inteligencije i učinka zaposlenih, odnosno indirektnog uticaja motivacije na učinak, korišćen je elektronski upitnik „Google Forms“ koji se sastoji iz dva dela. Prvi deo upitnika odnosi se na kontrolna pitanja kao što su pol, godine starosti, nivo obrazovanja, tip sektora u kome su ispitanici zaposleni i hijerarhijski nivo na kome rade u organizaciji. Drugi deo upitnika bio je vezan isključivo za procenu motivacije zaposlenih kao nezavisne varijable, za učinak zaposlenih kao zavisne

varijable i veštačke inteligencije kao posredne varijable ili medijatora. Za istraživanje i merenje korišćena je Likertova skala, u rasponu od 1 do 5, pri čemu 1 predstavlja tvrdnju „izrazito se ne slažem“, 2 „ne slažem se“, 3 „neodlučno“; 4 „slažem se“ i 5 „izrazito se slažem“ (Joshi et al., 2015). Link upitnika je podeljen zaposlenima koji pripadaju turističkom i ugostiteljskom sektoru.

2.2 Karakteristike uzorka

Upitnik je bio namenjen isključivo zaposlenim licima na različitim pozicijama u turističkom i ugostiteljskom sektoru. Upitnik koji se odnosi na relacije između motivacije, učinka zaposlenih i veštačke inteligencije popunilo je 202 zaposlenih lica na teritoriji Republike Srbije. Prikupljanje podataka je izvršeno počev od maja do avgusta 2023. godine. U **tabeli 1** prikazana je struktura uzorka prema polu, godinama starosti, obrazovanju, tipu sektora u kome su ispitanici zaposleni i hijerarhijskom nivou na kome rade u organizaciji. Uzorak su činili uglavnom ispitanici ženskog pola (64,40%), zaposleni od 35 do 44 godine (52,50%), sa završenim četvorogodišnjim akademskim studijama (50,50%) u uslužnom sektoru (59,40%).

Tabela 1. Karakteristike uzorka

Karakteristike uzorka		N	Struktura uzorka
Pol		202	100
1.	Muški	72	35,60
2.	Ženski	130	64,40
Godine starosti		202	100
1.	Ispod 25	2	1,00
2.	25-34	50	24,80
3.	35-44	106	52,50
4.	45-55	39	19,30
5.	Iznad 55	5	2,50
Nivo obrazovanja		202	100
1.	Srednja škola	3	1,50
2.	Osnovne strukovne studije	24	11,90
3.	Master strukovne studije	23	11,40
4.	Osnovne akademske studije	102	50,50
5.	Master akademske studije	38	18,80
6.	Doktorske akademske studije	12	5,90
Tip sektora		202	100
1.	Turistički sektor	82	40,60
2.	Uslužni sektor	120	59,40

Izvor: Autor na bazi sopstvenog istraživanja

Rezultati istraživanja

Za predstavljanje rezultata istraživanja o postojanju relacija između motivacije i učinka zaposlenih, korišćeni su statistički softveri „SPSS“ i „Smart PLS“. Kako bi se na adekvatan način utvrdili odnosi između posmatranih varijabli, izvršena je

PLS-SEM analiza. Dakle, istraživanje je sprovedeno kako bi se utvrdio direktan uticaj motivacije na učinak zaposlenih u turizmu i ugostiteljstvu, kao i posredan efekat veštačke inteligencije (AI). U **tabeli 2** prikazana je deskriptivna statistika za svaku od posmatranih varijabli.

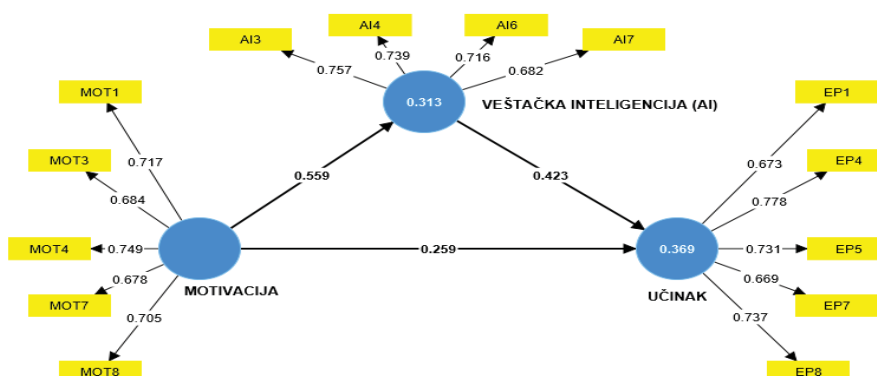
Tabela 2. Deskriptivna statistika za posmatrane varijable

	N	Minimum	Maximum	Mean	Std. Deviation
MOTIVACIJA	202	2,75	5,00	4,3370	0,38919
UČINAK	202	2,00	5,00	4,3000	0,42679
VEŠTAČKA INTELIGENCIJA (AI)	202	2,50	5,00	4,2690	0,44120

Izvor: Autor na bazi sopstvenog istraživanja

U okviru prvog dela analize prikazani su rezultati merenja reflektivnih konstrukata u okviru postavljenog modela, pri čemu je neophodno analizirati spoljno opterećenje indikatora za svaku promenljivu u okviru modela, ali i pouzdanost, konvergentnu validnost i diskriminatornu validnost. U **tabeli 3**, prikazano je spoljno opterećenje indikatora za svaku promenljivu u postavljenom modelu. Kako navode Grubor i ostali (2020) i Berber i ostali (2020) opterećenja ispod 0,708 treba da budu isključena iz dalje analize. Prema Berber i ostali (2022) opterećenja između 0,4 i 0,7 treba zadržati u modelu, samo ukoliko se ne remete ostali pokazatelji. Kako su opterećenja remetila ostale pokazatelje, u okviru prvog koraka analize dobijenih rezultata, isključeni su indikatori MOT2, MOT5, MOT6, EP2, EP3, EP6, AI1, AI2 I AI5. Nakon isključivanja indikatora koji nisu prošli test, u drugom koraku su svi indikatori imali opterećenja iznad 0,6, što je prihvatljivo prema Jevtić i Gašić (2023).

Slika 1. Prikaz istraživačkog modela



Izvor: Autor na bazi sopstvenog istraživanja

Tabela 3. Spoljno opterećenje svih indikatora iz postavljenog modela

	MOTIVACIJA	UČINAK	VEŠTAČKA INTELIGENCIJA (AI)
MOT1	0,717		
MOT3	0,684		
MOT4	0,749		
MOT7	0,678		
MOT8	0,705		
EP1		0,673	
EP4		0,778	
EP5		0,731	
EP7		0,669	
EP8		0,737	
AI3			0,757
AI4			0,739
AI6			0,716
AI7			0,682

Izvor: Autor na bazi sopstvenog istraživanja

U **tabeli 4** prikazana je pouzdanost i konvergentna validnost koja je merena Cronbach's alpha, kompozitna pouzdanost i ekstrahovana prosečna varijansa (AVE). Prema Gašić i Berber (2021), granična vrednost za Cronbach's alpha je 0,6. Konvergentna validnost se postiže za sve konstrukte iz modela, jer su vrednosti Cronbach's alpha veće od 0,60. Prema Gašić i Berber (2023) preporučeni „prag“ vrednosti za kompozitnu pouzdanost je 0,70. Kompozitna pouzdanost je preko 0,80 za svaki konstrukt iz modela, dok je ekstrahovana prosečna varijansa (AVE) veća od 0,50, kako i navode Berber et al. (2020) i Salisu et al. (2015).

Tabela 4. Pouzdanost i konvergentna validnost

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
MOTIVACIJA	0,749	0,751	0,833	0,50
UČINAK	0,766	0,773	0,842	0,53
VEŠTAČKA INTELIGENCIJA (AI)	0,697	0,697	0,815	0,52

Izvor: Autor na bazi sopstvenog istraživanja

Prema Berber et al. (2022) diskriminantna validnost se može utvrditi na osnovu analize unakrsnih opterećenja (Cross-Loadings), Fornell-Larcker kriterijuma i HTMT. U **tabeli 5** prikazana je analiza unakrsnih opterećenja koja predstavlja

procenu diskriminantne validnosti na nivou indikatora. Posmatrani model ima odgovarajuću diskriminantnu validnost ukoliko je svaki indikator određenog konstrukta slabo korelisan sa drugim konstruktima, odnosno ukoliko je opterećenje indikatora veće od bilo kog unakrsnog opterećenja (Grubor et al., 2021). U prikazanoj **tabeli 5** je evidentno da je opterećenje svakog indikatora veće od bilo kog drugog konstrukta u istoj koloni ili redu.

Tabela 5. Diskriminantna validnost - analiza unakrsnih opterećenja (Cross-loadings)

	MOTIVACIJA	UČINAK	VEŠTAČKA INTELIGENCIJA (AI)
MOT1	0,717	0,361	0,344
MOT3	0,684	0,377	0,370
MOT4	0,749	0,37	0,435
MOT7	0,678	0,357	0,404
MOT8	0,705	0,283	0,418
EP1	0,347	0,673	0,347
EP4	0,360	0,778	0,437
EP5	0,368	0,731	0,44
EP7	0,269	0,669	0,341
EP8	0,418	0,737	0,455
AI3	0,383	0,422	0,757
AI4	0,428	0,407	0,739
AI6	0,426	0,36	0,716
AI7	0,381	0,452	0,682

Izvor: Autor na bazi sopstvenog istraživanja

Na nivou indikatora, diskriminantna validnost je uspostavljena ukoliko je estrahovana prosečna varijansa (AVE) za svaki konstrukt veća od njegovih kvadratnih korelacija sa drugim konstruktima (Grubor et al., 2021). Fornell-Larcker kriterijum je ispunjen ukoliko je prvi konstrukt veći od drugog konstrukta. Na osnovu **tabele 6** može se zaključiti da je diskriminantna validnost preko Fornell- Larckerovog kriterijum postignuta.

Tabela 6. Diskriminantna validnost – Fornell – Larcker kriterijum

	MOTIVACIJA	UČINAK	VEŠTAČKA INTELIGENCIJA (AI)
MOTIVACIJA	0,707		
UČINAK	0,496	0,719	
VEŠTAČKA INTELIGENCIJA (AI)	0,559	0,568	0,724

Izvor: Autor na bazi sopstvenog istraživanja

U **tabeli 7** prikazan je HTMT pristup kojim se mogu prevazići potencijalna odstupanja po pitanju diskriminantne validnosti i zato predstavlja najprecizniji pokazatelj diskriminantne validnosti. Granična vrednost je 0,90 (Franke, Sarstedt, 2019). Kako su u tabeli sve prikazane vrednosti ispod 0,9 to ukazuje da je postignuta diskriminantna validnost po pitanju ovog kriterijuma.

Tabela 7. Diskriminantna validnost – HTMT

	MOTIVACIJA	UČINAK	VEŠTAČKA INTELIGENCIJA (AI)
MOTIVACIJA			
UČINAK	0,645		
VEŠTAČKA INTELIGENCIJA (AI)	0,772	0,768	

Izvor: Autor na bazi sopstvenog istraživanja

Rezultati koji su prikazani u **tabeli 8** predstavljaju analizu multikolinearnosti, pri čemu su vrednosti za VIF u većini slučajeva ispod 3. Granična vrednost za VIF je 3 (Hair et al., 2014). Prema Shams et al. (2020) granična vrednost je 5, dok se prema Hair et al. (2019) prihvataju i vrednosti manje od 10. U postmatranom modelu sve vrednosti su ispod 3.

Tabela 8. Testiranje multikolineranosti indikatora

	VIF
MOT1	1,467
MOT3	1,353
MOT4	1,56
MOT7	1,285
MOT8	1,461
EP1	1,347
EP4	1,594
EP5	1,411
EP7	1,367
EP8	1,399
AI3	1,419
AI4	1,355
AI6	1,372
AI7	1,248

Izvor: Autor na bazi sopstvenog istraživanja

R Squared pokazuje da su promene u ostvarenom učinku zaposlenih 36,9% izazvane veštačkom inteligencijom, dok ostali neistraženi faktori čine 63,1%.

Tabela 9. Koeficijenti determinacije konstrukta (R Square)

	R-square	R-square adjusted
UČINAK	0,369	0,362
VEŠTAČKA INTELIGENCIJA (AI)	0,313	0,309

Izvor: Autor na bazi sopstvenog istraživanja

Poslednji korak odnosi se na analizu odnosa između nezavisne varijable i zavisnih varijabli, odnosno motivacije zaposlenih i učinka zaposlenih, kao i posredničkom ulogom veštačke inteligencije u relaciji između motivacije i učinka zaposlenih.

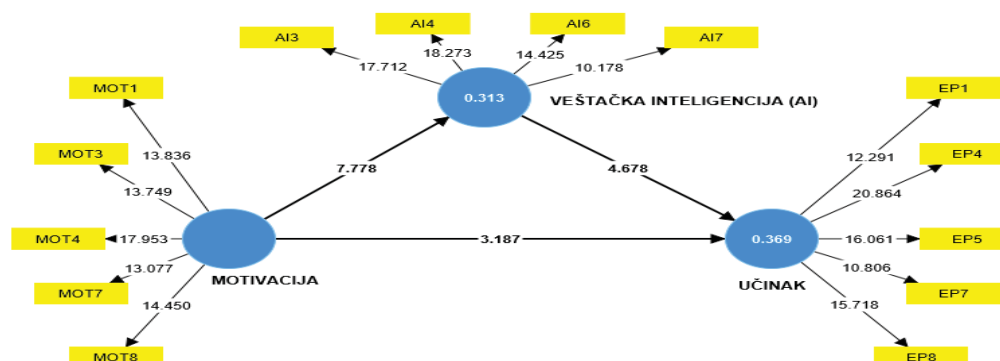
Tabela 10. Testiranje statističke značajnosti - direktni i specifičan (medijatorski) indirektni efekat

	Original sample	Sample mean	Standard deviation	T statistics	P values
MOTIVACIJA→UČINAK	0,259	0,263	0,081	3,187	0,001
MOTIVACIJA →VEŠTAČKA INTELIGENCIJA (AI)	0,559	0,565	0,072	7,778	0,000
VEŠTAČKA INTELIGENCIJA (AI)→UČINAK	0,423	0,425	0,09	4,678	0,000
MOTIVACIJA→VEŠTAČKA INTELIGENCIJA (AI) →UČINAK	0,237	0,241	0,063	3,751	0,000

Izvor: Autor na bazi sopstvenog istraživanja

Tabela 10 obuhvata srednju vrednost, standardnu devijaciju, t – statistiku i p – vrednost. Na osnovu dobijenih rezultata može se zaključiti da postoji pozitivna i statistički značajna veza između motivacije i učinka zaposlenih ($\beta=0,259$, $T=3,187$, $p=0,001$) pozitivna i statistički značajna veza između motivacije zaposlenih i veštačke inteligencije ($\beta=0,559$, $T=7,778$, $p=0,000$), pozitivna i statistički značajna veza između veštačke inteligencije i učinka zaposlenih ($\beta=0,423$, $T=4,678$, $p=0,000$). Kada je reč o posredničkoj ulozi veštačke inteligencije u relaciji između motivacije i učinka zaposlenih, odnosno indirektnom uticaju motivacije na učinak zaposlenih, putem medijacije utvrđuje se pozitivna i statistički značajna veza, indirektni uticaj motivacije na učinak zaposlenih ($\beta=0,237$, $T=3,187$, $p=0,000$).

Slika 2. Prikaz istraživačkog modela sa bootstrabing rezultatima



Izvor: Autor na bazi sopstvenog istraživanja

Diskusija o rezultatima istraživanja

Rezultati istraživanja ukazuju da motivacija ima pozitivan efekat na primenu veštačke inteligencije. Kako primena veštačke inteligencije posreduje u relaciji između motivacije i učinka zaposlenih, postoji indirektan efekat motivacije na učinak zaposlenih. Dakle, na osnovu sprovedenog istraživanja može se zaključiti da postoji direktan, pozitivan i statistički značajan uticaj motivacije na primenu veštačke inteligencije, direktan, pozitivan i statistički značajan uticaj motivacije na učinak zaposlenih i pozitivan statistički značajan uticaj između primene veštačke inteligencije i učinka zaposlenih. Na taj način mogu se potvrditi postavljene hipoteze H1 i H2. Kada je reč o indirektnom uticaju motivacije na učinak zaposlenih preko primene veštačke inteligencije, utvrđen je pozitivan i statistički značajan uticaj. Medijatorska analiza je sprovedena kako bi se utvrdilo da li postoji posrednička uloga primene veštačke inteligencije u odnosu na motivaciju i učinak zaposlenih u turizmu i ugostiteljstvu. Obzirom na to da postoje direktne veze između motivacije, primene veštačke inteligencije i učinka zaposlenih kao i indirektna veza između motivacije i učinka zaposlenih posredstvom primene veštačke inteligencije može se zaključiti da je formirana delimična medijacija.

Zaključna razmatranja

Ljudski resursi su najkonkurentnija imovina svake organizacije koja ima bitnu ulogu u postizanju ciljeva i uspešnosti u celini. U tom kontekstu su motivacija, zadovoljstvo poslom i radni učinak prepoznati kao ključni pojmovi vezani za ljudske resurse. Na osnovu pregleda literature i sprovedenog istraživanja zaključuje se da dobro organizovan motivacioni sistem i adekvatan izbor motivatora usmeren ka zaposlenima sa stanovišta poslodavca igra odlučujuću ulogu u uspehu organizacije. Dakle, postoji direktan, pozitivan i statistički značajan uticaj motivacije na primenu veštačke inteligencije, direktan, pozitivan i

statistički značajan uticaj motivacije na učinak zaposlenih i pozitivan statistički značajan uticaj između primene veštačke inteligencije i učinka zaposlenih. Adekvatan pristup motivaciji od strane organizacije usmeren ka zaposlenim u turizmu i ugostiteljstvu, jačanje sposobnosti u pogledu AI rezultiraće većim učinkom zaposlenih.

Ograničenje sprovedenog istraživanja odnosi se na relativno mali uzorak. Neki od predloga za buduća istraživanja je da se poveća broj ispitanika u organizacijama koje razvijaju različite modele i sisteme motivacije zaposlenih i primene veštačke inteligencije. Suština je da primena savremene tehnike i tehnologije postane ključno pitanje savremene radne organizacije. Organizacije na osnovu sistema merenja motivacije zaposlenih treba da teže da različitim materijalnim i nematerijalnim podsticajima podstaknu zaposlene na primenu savremene tehnike i tehnologije i time doprinesu povećanju učinka.

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THE MEDIATING ROLE OF ARTIFICIAL INTELLIGENCE IN MOTIVATION AND PERFORMANCE OF EMPLOYEES

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Abstract

The aim of the research was to examine the relationships between motivation and employee performance, as well as the mediating effect of artificial intelligence between the motivation system and employee performance in tourism. The main research question relates to determining the relationships that motivation has on employee performance in tourism and the roles that artificial intelligence plays in this relationship. The empirical research was conducted on a sample of 202 employees in tourism and hospitality in the Republic of Serbia from May to August 2023 using an electronic questionnaire. The proposed relationships were tested using the PLS-SEM method with SmartPLS software. The research indicated that there is a direct positive effect of motivation on the implementation of artificial intelligence and employee performance. The implementation of artificial intelligence has an indirect impact on the relationship between motivation and employee performance in tourism and hospitality organizations. An adequate approach to motivation by the organization and strengthening capabilities regarding AI will result in higher employee performance.

Key words: Motivation, Performance, Artificial Intelligence, Tourism, Hospitality

JEL: M12, O33, Z3

Introduction

As Öztirak (2023) points out, artificial intelligence (AI) is at the forefront of digital transformation and is affecting the global economy, business and society. The emergence of this type of advanced technology has created new opportunities for organizations in the tourism and hospitality sectors. In modern conditions, service automation systems have accelerated tasks traditionally performed by front-line employees, such as guest registration (check-in/check-out), room service, bartending, chat bots and virtual voice assistance (Ivanov, Webster,

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2017). The emergence of this type of advanced technology has enabled tourism and hospitality employees to use artificial intelligence and automation solutions to create a more personalized and memorable guest experience, while reducing costs. According to Li, Bonn and Ye (2019), ongoing technological developments, artificial intelligence, automation and robotics have a significant impact on job profiles, working hours, employee-manager relations, performance and motivation and reward models. According to Gant (2014), performance is a combination of employees' abilities and motivation in the tourism and hospitality industry. Organizations in this dynamic environment are constantly trying to motivate their employees in order to achieve the best possible performance. The aim of this research is to examine the relationship between employee motivation and performance, as well as the indirect effect of artificial intelligence on the relationship between employee motivation and performance in the tourism and hospitality industry. The subject of the research is to determine the effect that motivation has on employee performance and the role of artificial intelligence in the aforementioned relationship.

Literature review

Motivation is a complex process of heterogeneous nature in which organizations encourage employees to act towards achieving business goals. Authors Shahzadi et al. (2014) state that employee motivation should be interpreted as a reflection of the level of energy, commitment and creativity that employees need to perform work tasks. According to Prahin and Katavić (2021) and Jain, Gupta and Bindal (2019), motivation is a process in which an organization inspires an employee to work through rewards in accordance with the goals it wants to achieve. Rosłon (2020) points out that a well-organized motivational system and an adequate selection of motivators cause desirable behavior in employees from the employer's point of view and thus play a decisive role in the success of the organization.

The tourism and hospitality sector is labor-intensive and human resources are a significant and decisive factor for its stability. Companies strive to attract and retain the highest quality human resources (Prahin, Katavić, 2021). Relying on human resources for the proper functioning and growth of service industries requires effective workforce practices to ensure that employees perform at an optimal level, thus enabling the sector to remain sustainable in a rapidly changing global environment (Zopiatis et al., 2014). The ultimate goal of organizational management is to have satisfied employees who perform at their best. Specifically, achieving the highest possible employee productivity and reducing the turnover of creative and quality people is the best performance (Sekeruš et al., 2019). The authors Ramos-Villagrassa et al. (2019) emphasize that performance is the ultimate criterion for human resource management. Performance is assessed based on work results that are determined by business standards (Sekeruš et al., 2019). The authors Shahzadi et al. (2014) conclude in their research that employee

motivation has a significant and positive relationship with employee performance. In their research, the authors Shahzadi et al. (2014) reveal that employee performance is directly affected by intrinsic rewards. Although research has shown that there is a positive correlation between employee motivation and work performance, it is still not clear which motivation factors contribute to the success of an organization (Prahin, Katavić, 2021). Based on a review of the literature in the field of employee motivation and performance in tourism and hospitality, the following hypothesis is put forward:

H1: Motivation has a positive and statistically significant effect on the performance of employees in tourism and hospitality organizations.

Artificial intelligence is identified in the literature with machines that exhibit aspects of the human mind (Huang, Rust, 2018; Longoni et al., 2020; Enholm et al., 2022; Haleem et al., 2022). Unlike earlier manufacturing or information technologies, AI can learn from data and update it without additional human intervention (Huang, Rust, 2018). According to Nuseir and El Refae (2022), artificial intelligence (AI) has become a significant factor in improving business capabilities that lead to improved business performance. AI has the ability to improve business processes, service task performance that leads to high organizational performance (Collins et al., 2021; Vlačić et al., 2021). It simulates human intelligence in machines, saving time and money in business transactions (Haleem et al., 2022). According to Verma et al. (2021) automation of service processes with artificial intelligence (AI) offers an additional opportunity to improve organizational performance and productivity. According to Velojić et al. (2021), incorporating artificial intelligence (AI) into the system improves the quality of the system itself and saves time and costs. Based on these statements, a second hypothesis was formed:

H2: Motivation has a positive and statistically significant impact on employee performance through artificial intelligence (AI) in tourism and hospitality organizations.

Methodology

2.1 Questionnaire

During the process of researching the relationship between employee motivation, artificial intelligence and employee performance, i.e. the indirect impact of motivation on performance, an electronic questionnaire "Google Forms" was used, which consists of two parts. The first part of the questionnaire refers to control questions such as gender, age, level of education, type of sector in which the respondents are employed and hierarchical level at which they work in the organization. The second part of the questionnaire was related exclusively to the

assessment of employee motivation as an independent variable, employee performance as a dependent variable and artificial intelligence as an indirect variable or mediator. A Likert scale was used for research and measurement, ranging from 1 to 5, where 1 represents the statement "strongly disagree", 2 "disagree", 3 "undecided"; 4 "agree" and 5 "strongly agree" (Joshi et al., 2015). The questionnaire link was distributed to employees belonging to the tourism and hospitality sector.

2.2 Sample characteristics

The questionnaire was intended exclusively for employees in various positions in the tourism and hospitality sector. The questionnaire, which relates to the relationship between motivation, employee performance and artificial intelligence, was completed by 202 employees in the territory of the Republic of Serbia. Data collection was carried out from May to August 2023. Table 1 shows the structure of the sample according to gender, age, education, type of sector in which the respondents are employed and hierarchical level at which they work in the organization. The sample consisted mainly of female respondents (64.40%), employees aged 35 to 44 (52.50%), with completed four-year academic studies (50.50%) in the service sector (59.40%).

Table 1. Sample characteristics

Sample Characteristics		N	Sample Structure
Gender		202	100
1.	Male	72	35,60
2.	Female	130	64,40
Age		202	100
1.	Under 25	2	1,00
2.	25-34	50	24,80
3.	35-44	106	52,50
4.	45-55	39	19,30
5.	Above 55	5	2,50
Education Level		202	100
1.	High School	3	1,50
2.	Basic Vocational Studies	24	11,90
3.	Master Vocational Studies	23	11,40
4.	Basic Academic Studies	102	50,50
5.	Master Academic Studies	38	18,80
6.	Doctoral Academic Studies	12	5,90
Sector Type		202	100
1.	Tourism Sector	82	40,60
2.	Service Sector	120	59,40

Source: Author based on own research

Research Results

To present the results of the research on the existence of relationships between employee motivation and performance, the statistical software "SPSS" and "Smart PLS" were used. In order to adequately determine the relationships between the observed variables, a PLS-SEM analysis was performed. Therefore, the research was conducted to determine the direct impact of motivation on the performance of employees in tourism and hospitality, as well as the indirect effect of artificial intelligence (AI). Table 2 shows descriptive statistics for each of the observed variables.

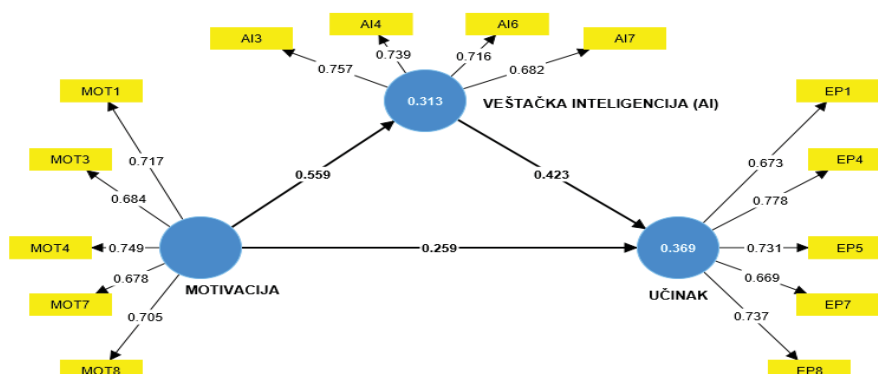
Table 2. Descriptive statistics for the observed variables

	N	Minimum	Maximum	Mean	Std. Deviation
MOTIVATION	202	2,75	5,00	4,3370	0,38919
PERFORMANCE	202	2,00	5,00	4,3000	0,42679
ARTIFICIAL INTELLIGENCE (AI)	202	2,50	5,00	4,2690	0,44120

Source: Author based on own research

The first part of the analysis presents the results of measuring reflective constructs within the established model, whereby it is necessary to analyze the external loading of indicators for each variable within the model, as well as reliability, convergent validity and discriminant validity. Table 3 shows the external loading of indicators for each variable in the established model. As stated by Grubor et al. (2020) and Berber et al. (2020), loadings below 0,708 should be excluded from further analysis. According to Berber et al. (2022), loadings between 0,4 and 0,7 should be retained in the model, only if other indicators are not disturbed. Since the loadings disturbed other indicators, in the first step of the analysis of the obtained results, indicators MOT2, MOT5, MOT6, EP2, EP3, EP6, AI1, AI2 and AI5 were excluded. After excluding indicators that did not pass the test, in the second step all indicators had loadings above 0,6, which is acceptable according to Jevtić and Gašić (2023).

Figure 1. Overview of the research model



Source: Author based on own research

Table 3. External loading of all indicators from the fitted model

	MOTIVATION	PERFORMANCE	ARTIFICIAL INTELLIGENCE (AI)
MOT1	0,717		
MOT3	0,684		
MOT4	0,749		
MOT7	0,678		
MOT8	0,705		
EP1		0,673	
EP4		0,778	
EP5		0,731	
EP7		0,669	
EP8		0,737	
AI3			0,757
AI4			0,739
AI6			0,716
AI7			0,682

Source: Author based on own research

Table 4 shows the reliability and convergent validity measured by Cronbach's alpha, composite reliability and average variance extracted (AVE). According to Gašić and Berber (2021), the threshold value for Cronbach's alpha is 0.6. Convergent validity is achieved for all constructs in the model, as Cronbach's alpha values are greater than 0,60. According to Gašić and Berber (2023), the recommended "threshold" value for composite reliability is 0,70. Composite

reliability is over 0,80 for each construct in the model, while the average variance extracted (AVE) is greater than 0,50, as reported by Berber et al. (2020) and Salisu et al. (2015).

Tabela 4. Pouzdanost i konvergentna validnost

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
MOTIVATION	0,749	0,751	0,833	0,50
PERFORMANCE	0,766	0,773	0,842	0,53
ARTIFICIAL INTELLIGENCE (AI)	0,697	0,697	0,815	0,52

Source: Author based on own research

According to Berber et al. (2022), discriminant validity can be determined based on the analysis of cross-loadings, the Fornell-Larcker criterion and the HTMT. Table 5 shows the cross-loading analysis, which represents an assessment of discriminant validity at the indicator level. The observed model has adequate discriminant validity if each indicator of a particular construct is weakly correlated with other constructs, i.e. if the loading of the indicator is greater than any cross-loading (Grubor et al., 2021). In the presented table 5, it is evident that the loading of each indicator is greater than any other construct in the same column or row.

Table 5. Discriminant validity - cross-loadings analysis

	MOTIVATION	PERFORMANCE	ARTIFICIAL INTELLIGENCE (AI)
MOT1	0,717	0,361	0,344
MOT3	0,684	0,377	0,370
MOT4	0,749	0,37	0,435
MOT7	0,678	0,357	0,404
MOT8	0,705	0,283	0,418
EP1	0,347	0,673	0,347
EP4	0,360	0,778	0,437
EP5	0,368	0,731	0,44
EP7	0,269	0,669	0,341
EP8	0,418	0,737	0,455
AI3	0,383	0,422	0,757
AI4	0,428	0,407	0,739
AI6	0,426	0,36	0,716
AI7	0,381	0,452	0,682

Source: Author based on own research

At the indicator level, discriminant validity is established if the average variance extracted (AVE) for each construct is greater than its squared correlations with other constructs (Grubor et al., 2021). The Fornell-Larcker criterion is met if the first construct is greater than the second construct. Based on Table 6, it can be concluded that discriminant validity via the Fornell-Larcker criterion is achieved.

Table 6. Discriminant validity – Fornell – Larcker criterion

	MOTIVATION	PERFORMANCE	ARTIFICIAL INTELLIGENCE (AI)
MOTIVATION	0,707		
PERFORMANCE	0,496	0,719	
ARTIFICIAL INTELLIGENCE (AI)	0,559	0,568	0,724

Source: Author based on own research

U **tabeli 7** prikazan je HTMT pristup kojim se mogu prevazići potencijalna odstupanja po pitanju diskriminantne validnosti i zato predstavlja najprecizniji pokazatelj diskriminantne validnosti. Granična vrednost je 0,90 (Franke, Sarstedt, 2019). Kako su u tabeli sve prikazane vrednosti ispod 0,9 to ukazuje da je postignuta diskriminantna validnost po pitanju ovog kriterijuma.

Table 7. Discriminant validity – HTML

	MOTIVATION	PERFORMANCE	ARTIFICIAL INTELLIGENCE (AI)
MOTIVATION			
PERFORMANCE	0,645		
ARTIFICIAL INTELLIGENCE (AI)	0,772	0,768	

Source: Author based on own research

The results shown in Table 8 represent a multicollinearity analysis, with VIF values in most cases below 3. The cut-off value for VIF is 3 (Hair et al., 2014). According to Shams et al. (2020), the cut-off value is 5, while according to Hair et al. (2019), values less than 10 are also accepted. In the post-observed model, all values are below 3.

Table 8. Testing for multicollinearity of the indicator

	VIF
MOT1	1,467
MOT3	1,353
MOT4	1,56
MOT7	1,285
MOT8	1,461
EP1	1,347

EP4	1,594
EP5	1,411
EP7	1,367
EP8	1,399
AI3	1,419
AI4	1,355
AI6	1,372
AI7	1,248

Source: Author based on own research

R Squared shows that 36.9% of changes in employee performance are caused by artificial intelligence, while other unexplored factors account for 63.1%.

Table 9. Coefficients of determination of the construct (R Square)

	R-square	R-square adjusted
PERFORMANCE	0,369	0,362
ARTIFICIAL INTELLIGENCE (AI)	0,313	0,309

Source: Author based on own research

The last step refers to the analysis of the relationship between the independent variable and the dependent variables, namely employee motivation and employee performance, as well as the mediating role of artificial intelligence in the relationship between employee motivation and performance.

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

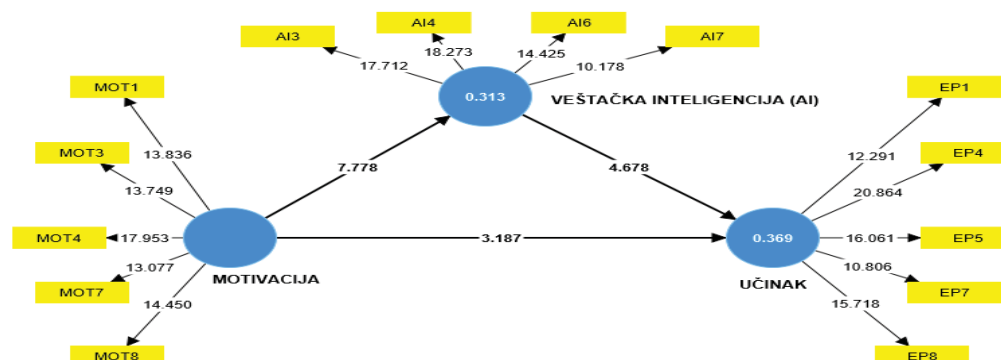
	Original sample	Sample mean	Standard deviation	T statistics	P values
MOTIVATION → PERFORMANCE	0,259	0,263	0,081	3,187	0,001
MOTIVATION → ARTIFICIAL INTELLIGENCE (AI)	0,559	0,565	0,072	7,778	0,000
ARTIFICIAL INTELLIGENCE (AI) → PERFORMANCE	0,423	0,425	0,09	4,678	0,000
MOTIVATION → ARTIFICIAL INTELLIGENCE (AI) → PERFORMANCE	0,237	0,241	0,063	3,751	0,000

Source: Author based on own research

Table 10 includes the mean, standard deviation, t-statistics and p-value. Based on the results obtained, it can be concluded that there is a positive and statistically significant relationship between employee motivation and performance ($\beta=0.259$, $T=3.187$, $p=0.001$) a positive and statistically significant relationship between employee motivation and artificial intelligence ($\beta=0.559$, $T=7.778$, $p=0.000$), a positive and statistically significant relationship between artificial intelligence and employee performance ($\beta=0.423$, $T=4.678$, $p=0.000$). When it comes to the

mediating role of artificial intelligence in the relationship between employee motivation and performance, i.e. the indirect impact of motivation on employee performance, a positive and statistically significant relationship is determined through mediation, the indirect impact of motivation on employee performance ($\beta = 0.237$, $T = 3.187$, $p = 0.000$).

Figure 2. Presentation of the research model with bootstrapping results



Source: Author based on own research

Discussion of research results

The research results indicate that motivation has a positive effect on the application of artificial intelligence. As the application of artificial intelligence mediates the relationship between motivation and employee performance, there is an indirect effect of motivation on employee performance. Therefore, based on the research conducted, it can be concluded that there is a direct, positive and statistically significant effect of motivation on the application of artificial intelligence, a direct, positive and statistically significant effect of motivation on employee performance and a positive statistically significant effect between the application of artificial intelligence and employee performance. In this way, the hypotheses H1 and H2 can be confirmed. When it comes to the indirect effect of motivation on employee performance through the application of artificial intelligence, a positive and statistically significant effect was determined. Mediation analysis was conducted to determine whether there is a mediating role of the application of artificial intelligence in relation to the motivation and performance of employees in tourism and hospitality. Given that there are direct links between motivation, the application of artificial intelligence, and employee performance, as well as an indirect link between motivation and employee performance through the application of artificial intelligence, it can be concluded that partial mediation has been formed.

Concluding remarks

Human resources are the most competitive asset of any organization that plays an important role in achieving goals and overall success. In this context, motivation, job satisfaction and performance are recognized as key concepts related to human resources. Based on the literature review and the conducted research, it is concluded that a well-organized motivational system and an adequate selection of motivators directed towards employees from the employer's point of view play a decisive role in the success of the organization. Therefore, there is a direct, positive and statistically significant impact of motivation on the application of artificial intelligence, a direct, positive and statistically significant impact of motivation on employee performance and a positive statistically significant impact between the application of artificial intelligence and employee performance. An adequate approach to motivation by the organization directed towards employees in tourism and hospitality, strengthening capabilities in terms of AI will result in higher employee performance.

The limitation of the conducted research relates to a relatively small sample. Some of the suggestions for future research are to increase the number of respondents in organizations that develop different models and systems of employee motivation and the application of artificial intelligence. The essence is that the application of modern techniques and technology becomes a key issue of modern work organization. Organizations, based on the employee motivation measurement system, should strive to encourage employees to apply modern techniques and technology through various material and non-material incentives and thus contribute to increasing performance.

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