

## Intellectual capital and productivity of managers: The case study of hotel industry in Serbia

### Intelektualni kapital i produktivnost menadžera: studija slučaja u hotelijerstvu Republike Srbije

Jasmina Ognjanović<sup>a\*</sup>, Marija Mandarić<sup>a</sup>, Dejan Sekulić<sup>a</sup>

<sup>a</sup>University of Kragujevac, Faculty of Hotel Management and Tourism in Vrnjačka Banja, Serbia

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#### Abstract

*Intellectual capital is the part of intangible assets that affects value creation. Intellectual capital includes human capital, structural capital, and customer capital. The paper aims to investigate the relationship between intellectual capital and the managers' productivity in hotel companies. The research included 80 hotels with 3-stars, 4-stars, and 5-stars. Testing of research hypotheses is performed by application of multiple regression analysis and ANOVA test. The obtained results support the positive contribution of the components of intellectual capital on the productivity of managers in hotel companies. Also, the results show that there is no significant difference in the level of achieved manager's productivity between hotels of 3-stars, 4-stars, and 5-stars.*

**Keywords:** intellectual capital, productivity of manager, hotel, human resource management

#### Sažetak

*Intelektualni kapital predstavlja deo nematerijalne imovine hotela koji utiče na stvaranje vrednosti. Intelektualni kapital obuhvata ljudski, strukturni i kapital kupaca. Cilj rada je da istraži vezu između intelektualnog kapitala i produktivnosti menadžera u hotelskim preduzećima. Istraživanje obuhvata 80 hotelskih preduzeća III, IV i V kategorije. U cilju analize postavljenih istraživačkih hipoteza primenjena je višestruka regresiona analiza i ANOVA test. Dobijeni rezultati podržavaju uticaj komponenti intelektualnog kapitala na produktivnost menadžera u hotelskim preduzećima. Takođe, na osnovu rezultata može se zaključiti da ne postoji značajna razlika u nivou ostvarene produktivnosti menadžera među hotelima III, IV i V kategorije.*

**Кljučне речи:** intelektualni kapital, produktivnost menadžera, hotel, menadžment ljudskim resursima


## 1. Introduction

The knowledge-based economy largely relies on the use of intangible assets, which are recognized as a driver of economic growth, a source of value creation, and competitive advantage (Carson et al., 2004; Ghosh & Mondal, 2009). Ivanović et al. (2021, p.352) consider that “the new core of economic advancement is the concept of intellectual capital that becomes more important over time, as the impact of financial assets on the financial performance of the company decreases, while the impact of intangible assets is increasingly dominant”. Research shows that in developed countries, investments in elements of intangible assets (intellectual capital, research

and development, development of brand, and development of workforce) are growing faster than investments in tangible assets (Carson et al., 2004). Intangible assets, such as intellectual capital and intellectual property, become more dominant, compared to tangible assets (Phusavat et al., 2013). For these reasons, the knowledge-based economy imposes the need for recognition and strategic management of intangible resources, because their invisible nature provides the basis for long-term value creation (Davey et al., 2017). The importance of intangible assets in determining organizational success is supported by a resource-based view (Oppong et al., 2019), so it is necessary to explore the relationship between the level of development and use of intangible assets and

\*Corresponding author

E-mail address: [jasmina.lukic@kg.ac.rs](mailto:jasmina.lukic@kg.ac.rs)

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employee performance. Intangible elements of the “service are important in the hotel industry, because they play an important role in assessing the guests’ satisfaction” and his decision to choose a particular hotel (Vujić et al., 2020, p.44). Intellectual capital (hereinafter, IC) is a part of intangible assets and its components are human capital, structural capital, and customer capital. Human capital is also recognized as the most important component of IC (Weqar et al., 2020). Human capital is capital embodied in employees which contains the knowledge, experience, skills, and abilities of employees (Kengatharan, 2019). IC may be the result of the process of transformation of knowledge into intellectual property (Ghosh & Mondal, 2009), which leads to the conclusion “that the values of IC investments are mostly generated from investments in human capital” (Buallay et al., 2021, p.526). The important part of IC is also structural capital and customer capital. Structural capital provides organizational support to employee performances. Customers capital is the value of all relationships that employees establish with customers and other stakeholders and which lead to the creation of loyal and satisfied customers. Providing the key benefits of IC management implies recognizing the importance of its components (human capital, structural capital, customer capital) which lead to better employee performance and business performance.

Some authors (Cheng et al. 2010; Phusavat et al., 2013) recognizes the importance of developing and management of IC in companies due to the need for a productive workforce and rapid innovation. These circumstances have induced many researchers to consider the potential contribution of IC to labor productivity (Bose, 2004; Cheng et al., 2010; Phusavat et al., 2013). However, the following research questions have been identified in the literature and need to be answered. First, companies do not use IC efficiently enough (Wang et al., 2016; Buallay et al., 2021). Inefficient use of IC can be conditioned by various factors, including the management’s method of the use of this capital. It is therefore necessary to explore the nature of the relationship between IC and the manager’s performance. Second, research shows a low level of productivity in hotel companies (Ahmad et al., 2016), so it is necessary to investigate whether IC and its components can lead to better results in managers’ productivity. Third, the business performance has previously been measured in terms of profitability, assets value, or market value. Modern business conditions require companies to change focus from the traditional way to the modern one, which assumes that IC and employees’ productivity are important for all companies (Buallay et al., 2021). Based on the above, the paper aims to investigate the relationship between IC and managers’ productivity in hotel companies.

## 2. Literature review and development of hypothesis

### 2.1. Intellectual capital in hotels

Many researchers believe that intangible resources become a key factor in gaining competitive advantage and market domination (Ghosh & Mondal, 2009). In the field

of tourism and hotel management, IC is recognized as a key resource for value creation (Davey et al, 2017). IC is a set of intangible investments that drive business performance and creating value (Huang & Jim Wu, 2010). Stewart (1997, p.XI) defines IC “as intellectual material - knowledge, information, intellectual property, experience – that can be put to use to create wealth”. IC is the difference between book value and market value and in some companies, it is up to 80% of the company's value (Weqar et al., 2020). The problem that accompanies the development of IC is that only part of its value is shown in the financial statements, which makes it difficult to manage IC and does not provide clear directions for investing in these assets. For these reasons, IC and its components are monitored qualitatively.

Human capital represents the knowledge, skills, and abilities of employees which are the results of education, training, and other career development programs (Marimuthu et al. 2009; Allameh, 2018). Human capital is “of vital importance for hospitality industry and its business activities” (Ognjanović, 2020, p.66), “bearing in mind that almost no relationship in the value chain can be fully automated and function without human resource” (Perić et al., 2021, p.44). Human capital is not owned by hotels (Engstrom et al., 2003), but it is important for achieving business success in labor-intensive industry (Dobrosavljević & Urošević, 2020). Human capital is recognized as a key factor in differentiating and gaining a competitive advantage in the hotel and tourism industry (Perić et al., 2020). Human capital is a set of competencies, intellectual agility, and attitudes of employees (Roos et al., 1997; Engstrom et al., 2003). These components of human capital will be analyzed in the paper. Competences represent the general knowledge, skills, or abilities of an employee that lead to effective behavior, which is shown through performance (Karadag & Dumanoglu, 2009). Attitude is a behavioral component of employee activities while intellectual agility is aimed at changing practice and creating innovative solutions to a specific problem (Engstrom et al., 2003). Research shows that insufficient investment in employees can cause poor financial performance of hotels (Laing et al., 2010). This conclusion leads to the need to analyze the relationship between human capital and employees’ productivity and whether the efficiency use of employees can be improved by investing in IC.

Structural capital “includes all the non-human storehouses of knowledge in organizations” (Engstrom et al., 2003, p. 288), which includes databases, organizational charts, process guidelines, and strategies (Allameh, 2018). Kengatharan (2019) includes systems, models, business processes, organizational structure, and business culture, in structural capital. Edvinsson and Malone (1997) observe structural capital as an aggregate of all organizational capabilities and resources that support employee productivity. Structural capital is created by employees but is owned by the organization (Weqar et al., 2020). This is the key difference between human capital. Individual knowledge of hotel employees as well as organizational knowledge are becoming key elements of efficient hotel management in a competitive environment

(Engstrom et al., 2003). Carson et al. (2004) emphasize that it is important for the organization to combine the use of human capital and structural capital in order for hotel management to overcome the challenges of high staff turnover and rapid restructuring.

Customer capital is “the current value of an organization’s relationship with its customers and the potential future value of these relationships” (Engstrom et al., 2003, p.288; Allameh, 2018). The impression that the hotel will leave on the guest depends, to a large extent, on the approach of the employees and the efficiency of their activities. The impression further influences the creation of a base of loyal guests who will recommend the hotel to new guests. A high level of guest satisfaction is the basic lever for creating long-term loyalty that leads to an increase in profit and reduced marketing and operating costs (Mandarić, 2016). Research in the hotel industry shows that the skills and competencies of employees, in the use of structural capital and building relationships with stakeholders, improve customer satisfaction and financial performances of the company (Lo, 2013; Davey et al., 2017). Also, some authors (Chen et al., 2004) believe that customers capital is most closely related to business performances.

The hotel industry is labor-intensive (Ognjanović, 2017), so the influence of IC on the business activities of these companies is undoubtedly significant. Hotel management must define clear guidelines for the management of intellectual resources (Bontis et al., 2015). The main issue in hotel management is the identification of factors that influence the strengthening of IC (Allameh, 2018) and how the development of IC can contribute to employee performance. Before developing an intellectual capital management strategy, hotel management must address several issues. Challenges faced by hotel managers are low level of employee productivity, a higher number of employees who have salaries below the minimum level, difficulties in paying salaries due to lower, unequal incomes, and conflicting laws and guidelines regarding billing issues (Ahmad et al., 2016). In addition, in the knowledge-based economy a special challenge is to define and monitor the productivity of knowledge activities and the knowledge worker (Huang & Jim Wu, 2010).

## 2.2. Employee productivity in hotels

Knowledge-worker productivity is regarded as the first requirement for the survival of companies in the 21st century in many developed countries (Drucker 1999; Huang & Jim Wu, 2010). Authors (Grant, 1996; Kengatharan, 2019), when explaining productivity, talk about the knowledge-based theory of the firm, which is based on the fact that knowledge can not be clearly expressed in measurable terms. As employees’ productivity depends primarily on knowledge, the appropriability of knowledge is achieved through the application of knowledge in business activities. Nerdrum and Erikson (2001) explain productivity by referring to human capital theory. “The accumulation of productive immaterial human capital embodied in human beings will increase the productivity of its owner, and in a well-

functioning labor market, this will typically lead to increased earnings” (Nerdrum & Erikson, 2001, p.129).

In the previous period, productivity was one of the key business performance (Masayoshi et al., 1991; Phusavat et al., 2013). Productivity in service organizations “primarily considers the best use of capabilities, the right use of resources and cost efficiencies” (Kengatharan, 2019, p.1059). Productivity can be explained as “efficiency in production, often expressed as an input–output relationship” (Ghosh & Mondal, 2009; Kengatharan, 2019, p.1059). Rahimpour et al. (2020) believe that data on productivity inputs and outputs are best obtained through questionnaires, keeping in mind job nature and employees’ personal information.

Some authors consider that employees and managers have an important role in ensuring productivity in hotels (Rahimpour et al., 2020). IC represents the use of employees’ experience and knowledge to improve productivity (Phusavat et al. (2013). Employees with knowledge and experience contribute to a high level of productivity and more efficient use of resources, which results in a reduction of production costs (Kengatharan, 2019) and better financial results.

The authors (Ahmad et al., 2016; Nerdrum & Erikson 2001) cite low wages in the hotel industry as a special problem, which is reflected in the productivity and efficiency of employees and managers. The payment of real salaries is a challenge for the management of companies (Ahmad et al., 2016). The productivity of skilled employees is higher than that of unskilled employees, which results in investment in the training and development of employees and providing higher salaries for skilled employees (Nerdrum & Erikson, 2001). A particular problem with human capital management is that expenditures on this capital are not shown in the balance sheet in full and are treated as an expense rather than an investment (Carson et al., 2004). Investing in the education and learning of employees should be considered an investment in human capital (Nerdrum & Erikson, 2001). For these reasons, Rahimpour et al. (2020, p.1484) suggest that hotels must focus on employee “career development, compensation and rewards, job security and workplace environment to improve employees’ loyalty” and productivity.

## 2.3. Relationship between intellectual capital and employee productivity

The transition to a knowledge-based economy leads to the fact that companies become far more dependent on investment in human resources, IT, research and development, in creating and maintaining a competitive advantage (Laing et al., 2010). Competitive advantage stems from superior resources and capacities, as well as the productive use of these resources (Bontis et al., 2015). It is “widely accepted among practitioners that IC is used as a key determinant of employees’ productivity which is a direct function of an organization’s performance” (Buallay et al., 2021, p. 1). In other words, the efficiency of the use of IC can become a significant indicator of

employee productivity, so the key challenge for companies is to ensure that intellectual assets are used productively (Phusavat et al., 2013).

Previous studies analyze the relationship between elements of IC and labor productivity (Frutos-Belzón et al., 2019). Companies with high IC performance are expected to have a higher profitability rate as well as a higher level of productivity (Ghosh & Mondal, 2009). Studies (Ognjanović & Pešterac, 2019; Xu & Li, 2021; Buallay et al. 2021) conclude that the value-added intellectual coefficient (VAIC) and its components are positively and significantly correlated with employees' productivity. Huang and Jim Wu (2010) conclude that all observed dimensions of IC have a positive and significant impact on knowledge productivity. Kengatharan (2019) conducts research among 232 managers of companies from different industries: banking, insurance, telecommunications, and hospitality. The author points out a strong correlation between IC and productivity. Weqar et al. (2020) conclude that the efficiency of IC significantly increases profitability and productivity in Indian banks. The same authors conclude that the most important component of IC is human capital, which contributes to increasing the productivity of banks.

Studies (Calisir et al., 2010; Oppong et al., 2019; Xu & Li, 2021) conclude that capital employed efficiency is a key predictor of productivity. The importance of tangible assets for hotel operations is still indisputable, but financial statements show the real value of tangible assets, while the value of intellectual assets is only partially shown.

Firer and Williams (2003) prove that the relation between the efficiency of value-added (VA) and productivity is generally limited and mixed. Some previous studies have not found a direct link between productivity and components of IC (Ghosh & Mondal, 2009; Pal & Soriya, 2012). Ognjanović and Pešterac (2019) conclude that IC does not affect the value-added per employee in the Serbian banking sector.

Studies that have analyzed the IC in the hospitality industry have presented the following results. The growing importance of the knowledge economy and IC development leads to the fact that traditional performance (ROI, ROA) is not enough to analyze the impact of technology and human resources on organizational performance, so IC has a key role in creating employees' productivity, which contributes to hotel business performance (Laing et al., 2010; Buallay et al., 2021). Bontis et al. (2015) conclude that employee productivity is influenced by the human capital and structural capital of hotel companies. Karadag and Dumanoglu (2009, p.479) prove that "there is a strong relationship between guest-related IT applications and productivity in the lodging industry". The results of research by Sarmento, M. (2010, p.398) show "that hotels consider that e-learning increases productivity and production volume". Also, e-learning could increase employees' motivation.

Accordingly, research supports the relationship between IC and employee productivity. The focus of the paper will be on exploring the relationship between IC components and the productivity of hotel managers. The aim is to determine how hotel management uses intellectual resources and whether productivity can be improved by effective uses of components of IC. Therefore, the following research hypotheses are defined:

H<sub>1</sub>: There is a statistically significant impact of IC on managers' productivity

H<sub>1a</sub>: There is a statistically significant impact of human capital on managers' productivity

H<sub>1b</sub>: There is a statistically significant impact of structural capital on managers' productivity

H<sub>1c</sub>: There is a statistically significant impact of customer capital on managers' productivity

H<sub>2</sub>: There is a statistically significant difference in the level of managers' productivity between hotels of different categories.

### 3. Research instrument and statistical methods

#### 3.1. Sample description and research instrument

The sample consists of 80 hotels that were active enterprises in the Republic of Serbia in 2020. Information about the hotel's name, category, and type of hotel is taken from the website of the Ministry of Trade, Tourism, and Telecommunications of the Republic of Serbia. The research was conducted in October of 2020. The questionnaire was used as a research instrument.

The research is based on interviewing managers of the hotel. The implementation of the research included the definition of three criteria: (1) the sample consists of the following types of hotels: Garni hotel, hotel, and apart-hotels; (2) only hotel managers were surveyed as someone who could best assess the development of IC components; (3) hotel managers (3-stars, 4-stars, 5-stars) were interviewed because it is assumed that these hotels have a higher value of IC. These criteria were met by 273 hotels. The manager was interviewed online, by phone, and in a face-to-face interview. The number of interviewed hotel managers was reduced to 80, so that the response rate was 29.3%.

The questionnaire consists of three parts: the first part includes profile questions to obtain information about the respondents and the type of hotel where they work. The second part of the questionnaire includes items used to assess the level of IC development. IC in the paper is observed through three components: human capital, structural capital, and customer capital (see Bontis et al., 2000; Engstrom et al., 2003). The assessment of the components of IC was performed on the model of paper by Bontis (1998); Engstrom et al., 2003; Rudež & Mihalič, 2007). Human capital is observed through the components: managers' competencies, intellectual agility, and managers' attitude (see Engstrom et al. 2003; Marr et al., 2004, p.557). Structural capital is observed through the components: efficiency and effectiveness, renewal and development, systems and procedures (Engstrom et al., 2003), while customer capital is monitored through the

following components: loyalty and customer satisfaction, market orientation, customer relationship management (see Engstrom et al., 2003). The third part of the questionnaire includes six items that are used to assess the productivity of managers. These items are defined by Musah et al. (2016) and Baumann et al. (2016). Previous studies have focused on the quantitative expression of employees' productivity (Bontis et al., 2015; Ognjanović & Pešterac, 2019; Xu & Li, 2021).

**Table 1.** Sample description

Criterion	N	%
<i>Category</i>		
***	51	64
****	28	35
*****	1	1
<i>Gender</i>		
Male	30	37
Female	50	63
<i>Region</i>		
Vojvodina	14	17
Beograd	27	34
Šumadija and Western Serbia	23	29
Southern and Eastern Serbia	16	20
<i>Number of employees in the hotel</i>		
Up to 9 employees	22	28
Between 10 and 49 employees	45	56
Between 50 and 249 employees	13	16
250 and more employees	-	-

Source: Authors

In the observed sample, 3-star hotels are the most represented (64%), while 5-star hotels have the smallest share (1%). The largest number of respondents are women (63%), while male respondents make up 37% of the sample. The sample is dominated by hotels with some employees "between 10 and 49" (56%), while the sample includes hotels with some employees "up to 9" and the number of employees "between 50 and 249" by 28% and 16%, respectively. The largest number of observed hotels is located in the Belgrade region (34%) and the region of Šumadija and Western Serbia (29%).

### 3.2. Statistical methods

Statistical data processing was performed using the IBM SPSS Statistics, Version 23. The descriptive results are presented first. The description of the sample is based on the values of mean and standard deviation for the observed variables, with the definition of the values of skewness and kurtosis. The reliability of the items used in the questionnaire is tested by reliability analysis and correlation analysis is performed to test the strength and direction of the relationship between the variables. Testing of the set research hypotheses is performed by applying multiple regression analysis and ANOVA test.

## 4. Results of the research and discussions

### 4.1. Descriptive statistics

The highest value of the mean has the component "manager's attitude" (Mean = 4.7125). The best-rated component of structural capital is "systems and

procedures" (Mean = 4.5031), while the best-rated component of customer capital is "loyalty and satisfaction of guest" (Mean = 4.5625). The mean for the dependent variable "manager productivity" is 4.7458. The largest standard deviation has the variable "efficiency and effectiveness" (Std. Dev. = 0.9054).

The skewness values are negative, which means that the results are so distributed that they are closer to higher values. Most of the obtained results of kurtosis are positive, which means that the distribution is sharper than normal.

### 4.2. Reliability analysis

The reliability of the observed items is estimated by values of Cronbach's alpha coefficient. The obtained value indicates high reliability and consistency of items since the value of Cronbach's alpha coefficient is greater than 0.7 which is recommended minimum value (Nunnally, 1978). The value of the Cronbach's alpha coefficient observed for individual variables, ranges in the interval from 0.811 (Loyalty and satisfaction of guest) to 0.847 (Efficiency and effectiveness) (Table 2).

**Table 2.** Results of reliability analysis

Variables	Value of coefficient Cronbach's alpha
<b>Human capital</b>	
Competences of managers	0.820
Intellectual agility	0.838
Manager's attitude	0.813
<b>Structural capital</b>	
Efficiency and effectiveness	0.847
Renewal and development	0.815
Systems and procedures	0.825
<b>Customer capital</b>	
Loyalty and satisfaction of guest	0.811
Market orientation	0.816
Consumer relationship management	0.822
<b>Productivity of managers</b>	0.823

Source: Author's calculation

### 4.3. Correlation analysis

Correlation analysis tests the direction and strength of the relationship between IC and managers' productivity and between IC components. The strength and direction of the correlation are determined by the value of the Pearson correlation coefficient. If the correlation coefficient ranges in the interval from 0 to 0.29, it is a weak correlation between variables, if it ranges in the interval from 0.30 to 0.49, it is a medium correlation, and if this coefficient is greater than 0.50, there is a strong correlation between variables (Pallant, 2011). The value of the correlation coefficient also determines the direction of the relation. A positive Pearson correlation coefficient means that the growth of one variable condition the growth of another. A negative Pearson correlation coefficient means that the growth of one variable leads to the decline of another variable. The results of the correlation analysis for the observed research model are shown in Table 3. The correlation between the components of human capital is positive, strong, and

statistically significant. The correlation between the components of structural capital is weak, positive, and statistically significant, while the correlation between the components of customer capital is strong, positive, and statistically significant. The dependent variable, the

productivity of managers, is most strongly correlated with the human capital component - the attitude of managers ( $r = 0.566$ ;  $p = 0.000$ ).

**Table 3.** Correlation matrix

	CA	IA	MA	EE	RD	SP	LSG	MO	CRM	MP
CA	1									
IA	0.438	1								
MA	0.634**	0.456**	1							
EE	0.252*	-0.045	0.379**	1						
RD	0.501**	0.302**	0.509**	0.329**	1					
SP	0.267*	0.279*	0.416**	0.261*	0.258*	1				
LSG	0.336**	0.327**	0.522**	0.308**	0.446**	0.536**	1			
MO	0.326**	0.294**	0.335**	0.269*	0.544**	0.335**	0.532**	1		
CRM	0.302**	0.090	0.414**	0.254*	0.336**	0.398**	0.620**	0.501**	1	
MP	0.439**	0.265*	0.566**	0.345**	0.425**	0.469**	0.497**	0.352**	0.373**	1

\* Correlation statistically significant at the level 0.050

\*\* Correlation statistically significant at the level 0.000

CM - Competences of managers; IA - Intellectual agility; MA - Manager's attitude; EE - Efficiency and effectiveness; RD - Renewal and development; SP - Systems and procedures; LSG - Loyalty and satisfaction of guest; MO - Market orientation; CRM - Consumer relationship management; MP - Managers' productivity

Source: Author's calculation

#### 4.4. Multiple regression analysis

Analysis of the impact of IC on managers' productivity is performed using multiple regression analysis. To test the set research hypotheses H1a, H1b, and H1c, three regression models will be used. The application of regression analysis implies the fulfillment of certain conditions related to multicollinearity and autocorrelation.

Multicollinearity represents a high degree of correlation between variables. Multicollinearity is monitored by the VIF coefficient, which should not be higher than 5. Tolerance values should be higher than 0.10 (Pallant, 2011). Autocorrelation is measured by Durbin-Watson statistics, which value should not exceed 4. The three observed regression models meet the conditions of multicollinearity and autocorrelation.

**Table 4.** Model 1: Human capital and productivity of managers

Components of human capital	Standard multiple regression				
	$\beta$	t	Sig.	Tolerance	VIF
Competences of managers	0.138	1.109	0.271	0.571	1.753
Intellectual agility	-0.019	-0.176	0.861	0.753	1.328
Manager's attitude	0.488	3.882	<b>0.000**</b>	0.557	1.795

Dependent variable: Managers' productivity

Significance: \*\*  $p \leq 0.01$ ; \*  $p \leq 0.05$

$R^2 = 0.332$ ;  $F = 12.573$ ;  $DW = 1,963$ ;  $p = 0.000$

Source: Author's calculation

For the observed regression Model 1 (Table 4), the results indicate that there is a statistically significant impact of human capital on the productivity of managers in hotel enterprises ( $p=0.000$ ). Hypothesis **H1a is supported**. The value of the coefficient of determination  $R^2$  is 0.332, which means that 33% of the variability of managers' productivity is explained by the regression model, while the rest is influenced by other factors. The value of

Adjusted R Square is 0.305 while the F statistic is 12.573. Statistically significant influence on managers' productivity has the managers attitude ( $\beta = 0.488$ ;  $t = 3.882$ ;  $p = 0.000$ ) which is shown in Table 4.

The analysis of the impact of components of structural capital on managers' productivity was performed in regression Model 2.

**Table 5.** Model 2: Structural capital and managerial productivity

Components of structural capital	Standard multiple regression				
	$\beta$	t	Sig.	Tolerance	VIF
Efficiency and effectiveness	0.160	1.594	0.115	0.858	1.165
Renewal and development	0.281	2.795	<b>0.007**</b>	0.860	1.163
Systems and procedures	0.355	3.612	<b>0.001**</b>	0.899	1.113

Dependent variable: Managers' productivity

Significance: \*\*  $p \leq 0.01$ ; \*  $p \leq 0.05$

$R^2 = 0.341$ ;  $F = 13,107$ ;  $DW = 1,705$ ;  $p = 0.000$

Source: Author's calculation

Hypothesis **H<sub>1b</sub> is supported**, i.e., a statistically significant impact of structural capital components on the productivity of managers of the observed hotels has been proven (Table 5). The regression model explained 34.1% of managers' productivity variability, while the rest was influenced by other factors. The data in Table 5 show that a statistically significant impact on managers' productivity have components Renewal and development ( $\beta = 0.281$ ;  $t = 2.795$ ;  $p = 0.007$ ) and Systems and procedures ( $\beta = 0.355$ ;  $t = 3.612$ ;  $p = 0.001$ ).

Within Model 3, it was tested the impact of components of customers' capital on managers' productivity. The data

given in Table 6, show that hypothesis **H<sub>1c</sub> is supported**, i.e., there is a statistically significant impact of customers' capital on the productivity of managers in hotel companies. The value of the  $R^2$  is 0.261, which means that 26% of the variability of managers' productivity is explained by the regression model while the rest is influenced by other factors. The value of Adjusted R Square is 0.232 while the F statistic is 8.941. Loyalty and satisfaction of guest has a statistically significant impact on managers' productivity ( $\beta = 0.393$ ;  $t = 2.957$ ;  $p = 0.004$ ), which is shown in Table 6.

**Table 6.** Model 3: Customer capital and managers' productivity

Components of customer capital	Standard multiple regression				
	$\beta$	t	Sig.	Tolerance	VIF
Loyalty and satisfaction of guest	0.393	2.957	<b>0.004**</b>	0.551	1.816
Market orientation	0.105	0.870	0.387	0.670	1.494
Customer relationship management	0.077	0.592	0.556	0.575	1.741

Dependent variable: Managers' productivity

Significance: \*\*  $p \leq 0.01$ ; \*  $p \leq 0.05$

$R^2 = 0.261$ ;  $F = 8.941$ ;  $DW = 1.766$ ;  $p = 0.000$

Source: Author's calculation

Testing the difference in the level of productivity between 3-stars, 4-stars, and 5-stars hotels was performed by applying a one-factor analysis of variance for different groups (ANOVA). The application of this test is based on a comparison of average results in three or more groups (Pallant, 2011). The assumption for conducting the ANOVA analysis is based on the values of the Levene test of homogeneity of variance (Pallant, 2011). The significance value for the Leven test is  $p = 0.547$ , which means that the assumption of homogeneity of variance is not violated, so the conditions for conducting ANOVA analysis are met.

**Table 7.** ANOVA test results

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.061	2	0.031	0.188	0.829
Within Groups	12.548	77	0.163		
Total	12.610	79			

Source: Author's calculation

The results of the ANOVA test indicate that hypothesis **H<sub>2</sub> is not supported**, i.e. there is no statistically significant difference in the level of managers productivity between hotels of different categories ( $F_{(2,77)} = 0.188$ ;  $p = 0.829$ ).

## 5. Discussion

The study raised the research question of whether IC and its components can improve managers' productivity. Research results show that IC is a significant factor of the high productivity of hotel managers. The relationship between IC and employees' productivity was also confirmed by Huang and Jim Wu (2010); Bontis et al. (2015); Kengatharan (2019); Ognjanović and Pešterac, 2019; Weqar et al. (2020); Xu and Li (2021). The results of the study are in agreement with the previous conclusions that employees are an important component

of productivity and activity in the hotel (Rahimpour et al., 2020). This conclusion is consistent with the assumption of Cheng et al. (2010) and Phusavat et al. (2013) that companies developing and invest in IC because of the need for a productive structure of employees and the creation of innovations.

The confirmed relation between IC and managers' productivity shows that knowledge and ability are important factors for maximizing value (Ognjanović & Pešterac, 2019). High productivity of employees is achieved by the best use of capabilities and cost efficiencies (Kengatharan, 2019). The approach of use and the intensity of the use of intellectual capacities are defined by the hotel management. The results show that increasing the productivity of managers can be achieved by investing in the attitude of managers, in the renewal and development, in systems and procedures, as well as by strengthening the loyalty and satisfaction of the guest. Strengthening the productivity of managers, conditioned by investing in IC, leads to better organization of work and efficient use of tangible and intangible capital of hotel, as well as to better employee performance.

## 6. Conclusion

The results of the statistical analysis for the observed hotel sample show that the components of IC positively contribute to the productivity of managers. By investing in human, structural, and customer capital, it is possible to increase the performance of managers' activities. The development of human capital contributes to the strengthening and dissemination of knowledge, abilities, and skills of managers, which affects the results of their work. The development of structural capital creates an organizational infrastructure that supports the use of knowledge and skills of managers in the work and performance of business activities, which also affect their

work results. The development of the third component of IC, customer capital, improves customer loyalty and satisfaction, which contributes to better manager results and overall business results of the hotel. The contribution of the study is that it analyzes the factors of IC that contribute to the productivity of managers. The previous studies have investigated the relationship between IC and the productivity of all employees.

The research conducted has several *limitations*. The first limitation relates to how IC data is collected. The development of IC in hotels is assessed based on a questionnaire and the manager's rating on a scale from 1 to 5. As many researchers (Vekar et al., 2020; Buallai et al., 2021) point to the problem of evaluation and presentation of IC, the development of IC in the paper is assessed qualitatively. In addition, a large number of observed hotels are not registered with the Serbian Business Registers Agency under the name of the hotel or are part of a larger company, which complicates the data collection process. The second constraint is based on the first and relates to the way managers' productivity is assessed. The value of productivity is the ratio of operating income to the number of employees. However, as only the total number of employees is stated in the financial statements, data on managers' productivity can only be obtained by questionnaire surveys. The third limitation refers to the low level of share of 5-stars hotels (1% of the sample) which are considered a driver of the hotel and IC development.

Future researchers could conduct a comparative analysis of the results of this study and a study that would explore the relationship between IC and the productivity of managers, which were calculated based on the values presented in the financial statements. Also, future research could be based on identifying the difference between managerial productivity and productivity of operational employee as well as the causes of these discrepancies.

The practical results of this research are reflected in the ability of restaurant managers to use them in the proper composition of menus and improve the offer in the restaurant itself. The limitations in this research are reflected exclusively due to the impossibility of conducting a live survey due to the Covid-19 pandemic.

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