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How did hotels measure performance during Covid-19? Insights from Central and Eastern Europe

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How did Hotels Measure Performance during Covid-19? Insights from Central and Eastern Europe

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Abstract

Background: One of the industries that was among the most disrupted by the Covid-19 pandemic was the tourism industry. Hotel owners and managers needed guidelines on how to combat the "new normal" and enable the sustainable economic operation of the hotels they managed. **Objectives:** This paper addresses the problem of identifying performance management (PM) indicators hotel managers turned to during the pandemic and the factors which motivated them to do so. **Methods/Approach:** Managers of hotels in winter destinations in Serbia and Bosnia and Herzegovina were surveyed on the performance measures they implemented in the hotels they managed. **Results:** The results of the research show that in the era of the Covid-19 pandemic, hotel managers relied on both organisational and operational measures but found operational indicators more useful. The characteristics of managers, such as business position in the hotel, age, level of education and level of work experience, are related to the choice of indicators and levels of their implementation. Also, the hotel's characteristics, such as size, revenue, and growth rate, proved to have an impact on the level of PM indicators measured. **Conclusions:** In times of crises, such as pandemics, organisational PM indicators that rely mainly on financial results are not as useful as operational ones. The reliance on operational measures of indicators increased the resilience of hotels.

Keywords: performance measurement; hotel industry; winter destinations; Covid-19 pandemic; Serbia; Bosnia and Herzegovina

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Introduction

In the last decade, the tourism industry has grown steadily and has had a strong impact on sustainable economic development in the countries of the Central and East European (CEE) region. Significant levels of investment by both the public and private sectors in the tourism industry of the CEE region have been recorded (The Travel & Tourism Competitiveness Report, 2019). The global Covid-19 pandemic has profoundly impacted societies and economies worldwide, creating significant hurdles for individuals, governments, and businesses alike (Pejić-Bach, 2021). Zhao et al. (2020) consider that the Covid-19 pandemic has caused an unprecedented recession in the tourism industry, particularly affecting the hotel sector. Various studies emphasise that the hotel industry was one of the most vulnerable sectors at the time of the Covid-19 pandemic (for example, Radygina & Oshkordina, 2020; Fatima & Elbanna, 2020; Magnini et al., 2021). Given the length of the Covid-19 pandemic, hotel managers were looking for new strategies that would be an adequate response to emerging business circumstances (Lai & Wong, 2020). The question that has occupied the attention of the scientific and professional community was how to mitigate the adverse effects of the Covid-19 pandemic on the performance of the hotel industry and enable the sustainable economic business of the industry.

The role of the sustainability dimension in the business processes attracted the attention of the scientific and professional community before the start of the pandemic, and interest further deepened during the Covid-19 pandemic. Numerous studies have pointed to the importance of performance management (PM) implementation in terms of sustainability (Hristov & Chirico, 2019; Dočekalová & Kocmanová, 2016; Amrina & Yusof, 2011; Martínez-Perales et al., 2018). At the same time, the process of developing sustainable business strategies in the hotel industry is closely related to performance measurement (Zigan & Zeglat, 2010; Haktanir & Harris, 2005; Fatima & Elbanna, 2020). PM systems in the hotel industry are associated with business process innovation and profitability (Phillips et al., 2005; Pnevmatikoudi & Stavrinoudis, 2016; Sainaghi et al., 2013; Zigan & Zeglat, 2010; Pingitore et al., 2010). Measuring performance in companies is at the core of business strategy, influencing their competitiveness and sustainable economic development (Hristov & Chirico, 2019). Given the efficiency of the PM system in terms of economically sustainable hotel business, increasing attention is being paid to the PM system, even in the era of the Covid-19 pandemic (Magnini et al., 2021). Sharma et al. (2021) considered that measuring the effects on the hotel industry during the Covid-19 pandemic is a priority. At the time of the Covid-19 pandemic, the key question was which indicators should be measured within the PM system of the hotel industry (Radygina & Oshkordina, 2020). Hotel service metrics, guest metrics, employee metrics and digital marketing metrics became key tools in hotel management in the era of a pandemic (Shin et al., 2021; Kilgore, 2020; Chaturvedi, 2020).

Winter tourism in the Central and Eastern Europe (CEE) region is recognised as a strategically important activity and generator of the development of national economies (Vanat, 2022). Recognising the importance of tourism development, CEE governments developed and are developing strategic tourism plans and investing significant resources in tourism development (The Travel & Tourism Competitiveness Report 2019). Serbia and Bosnia and Herzegovina (Bosnia) are distinguishable as regions with exceptional natural and geographical potential for the development of winter tourism (Vanat, 2022). This region is recognisable in the field of winter tourism, given the fact that the mountains Jahorina and Bjelašnica hosted the Winter Olympics in 1984 (Begic & Duman, 2013) as well as organised the Winter Youth Festival (EYOF) in 2019 (European Youth Olympic Festival-EYOF, 2019). In addition to the natural

potential for the development of winter tourism, significant investments in the development of hotel infrastructure have been recorded (Vanat, 2022). At the time of the Covid-19 pandemic, the issue was how to mitigate the consequences of the crisis and enable the sustainable economic business of the hotel.

This study aims to identify indicators used by hotel managers in Serbia and Bosnia during the Covid-19 pandemic. Having in mind that differences between countries are apparent in the response to the Covid-19 pandemic (Pejić-Bach et al., 2023), the question of which indicators to measure in the era of the Covid-19 pandemic has interested both the scientific community and hotel managers. Also, within this study, the factors that influence the levels of indicator implementation were examined. In accordance with the relevant literature, this study examined whether the levels of implementation of the PM system are related to factors such as hotel characteristics (hotel size, hotel revenue, sales growth, and levels of investment) and characteristics of the hotel manager (position in the hotel, age, level of education, and level of work experience). Additionally, managers' attitudes on the usefulness of various indicators in hotel management during the Covid-19 pandemic were analysed. To provide answers to the raised questions, a survey was conducted among winter hotel managers in Serbia and Bosnia. Furthermore, with respect to the subject of the research, this study updates the literature in the field of PM systems in the hotel industry of the CEE region during the Covid-19 pandemic. The presented PM systems' measurement can be a basic framework for the development of a performance measurement system in the CEE region, given the fact that specific indicators that hotel managers measured during the Covid-19 pandemic have been identified within this research. Given the fact that the CEE region is a homogeneous area in terms of business objectives and legislation, the exchange of practices in the field of PM systems in the hotel industry is desirable. The research results can be useful for understanding and implementing the PM not only during the Covid-19 period but also in the post-Covid period.

The presented study is structured as follows: In section two, we provide a literature review on PM systems in the hotel industry and on PM systems in the hotel industry during the Covid-19 era. The next section presents the research methodology and the sample characteristics. Section four is related to the results, while section five discusses the obtained results in depth. Finally, in section six, the conclusion is provided.

Literature review

PM systems in the hotel industry

The PM systems of the hotel industry started to develop in the late 1990s (Phillips et al., 2005). The increasing competitive pressure caused by the globalisation of the market required the application of PM systems to assess and improve business strategies, procedures, and functions (Jevtić et al., 2018; Stříteská & Svoboda, 2012; Phillips et al., 2005). Fatima and Elbanna (2020) consider PM systems to be vital for the survival and sustainable economic business of the hotel. Additionally, PM systems enable efficient management of high hotel business costs and complex hotel services (Atkinson & Brander Brown, 2001). In addition to pointing out the efficiency of the PM system in hotel management and the compliance of the PM system with hotel services, many papers indicate the need to modify the PM system in hotels (Chenhall & Langfeld-Smith, 2007; Zigan & Zeglat, 2010; Odar et al., 2012; Hansen & Schaltegger, 2016). Unlike traditional PM systems that rely on financial measures, modern performance measurement systems are based on the equal application of financial and non-financial measures. Zigan and Zeglat (2010) indicate that PM systems are effective

when they are based on the equal implementation of financial and non-financial criteria. Buhovac and Groff (2010) believe that the need to redesign traditional PM systems in the CEE region is imperative. Widz et al. (2022) consider that the improvement of non-financial performance is a must for the hotel sector, given the fact that non-financial performance is the driver of companies' competitiveness. Atkinson and Brander Brown (2001) state that hotels that do not use balanced PM systems and are more focused on financial rather than non-financial indicators measure the wrong aspects of business, which may lead to problems with future performance. Katsikeas et al. (2016) consider that the division of indicators into financial and non-financial indicators is outdated. Within the framework of their research, they divide the indicators into organisational and operational indicators. Financial and non-financial metrics are equally represented within the group, as well as organisational and operational indicators. Organisational indicators represent aggregate values of the performance of various operational activities of the business, which are measured using operational indicators.

A small amount of research focuses on the specific choice of indicators in specific industries (Hristov & Chirico, 2019; Hristov et al., 2019), such as the hotel sector of winter destinations. Buhovac and Groff (2010) consider PM systems to be unique. Mapping PM systems between different regions and industries is not the best solution (Wadong et al., 2010). Dai and Kuosmanen (2014) believe that the exchange of practices in the field of PM systems requires the homogeneity of the hotels in terms of size, number of employees, market share and similar characteristics. Magnini et al. (2021) consider that it is impossible to use the same indicators within the PM system in crises such as the Covid-19 pandemic and regular business conditions. In accordance with the previous statements, one of the research questions within this paper is what indicators hotel managers in Serbia and Bosnia measured in the era of the Covid-19 pandemic.

Relevant studies suggest that managerial attitudes are a key factor in the development and implementation of PM systems (Wadong et al., 2010; Modell, 2003). Performance measurement systems should be seen as an initiative to improve and achieve a corporate goal rather than as a control instrument, which facilitates their introduction into formal business processes. The positive attitude of managers towards performance measurement systems is extremely important because it enables the contribution of managers in the implementation of measures and improves the interpretation of the obtained results (Groen et al., 2012). Research in this paper will focus on the attitudes of hotel managers in CEE region countries regarding the usefulness of certain types of indicators in hotel management. In accordance with the previous statements, the following research hypothesis was defined:

- *H1: There is a link between the level of use of certain operational and organisational indicators and the attitudes of hotel managers about their usefulness.*

Various studies show that hotel size, hotel revenue, sales growth in hotel services, and the level of hotel investment are related to the choice of indicators and levels of their implementation (Hudson et al., 2001; Garengo et al., 2005; Odar et al., 2012). Managers of larger hotels implement several financial and non-financial indicators, which are reflected in savings, efficient resource management, and improved service quality (Bohdanowicz et al., 2011). Smaller hotels which do not have developed PM systems and measurement processes are limited to legally required financial criteria (Pereira-Moliner et al., 2015), indicating that large hotels which use several non-financial parameters achieve better performance and have a strong impact on the market by improving service quality. Sharma and associates (2021) consider that performance measurement is related to the revenues that hotels generate. The

implementation of non-financial metrics in the hotel industry is reflected in the growth of hotel services sales, hotel revenues and levels of investment in hotels (Bendle et al., 2015; Pnevmatikoudi & Stavrinoudis, 2016). Therefore, this research examines the relationship between hotel characteristics (hotel size, hotel revenue, sales growth in hotel services, and the level of hotel investment) and the level of PM system implementation. In accordance with the previous statements, the following research hypotheses were defined:

- *H2: The size of the hotel affects the level of implementation of organisational and operational indicators.*
- *H3: There are differences in the levels of implementation of organisational and operational indicators based on hotel revenues.*
- *H4: There are differences in the levels of implementation of organisational and operational indicators based on the growth of hotel sales in the past three years.*
- *H5: There are differences in the levels of implementation of organisational and operational indicators based on the level of hotel investment in the past three years.*

A question that has also attracted the attention of the scientific community is whether managerial characteristics such as education, position held in the hotel, work experience and age influence the choice of indicators and the level of their application (Jogaratnam et al., 2004; Todorović et al., 2015; Jugović et al., 2022). de Waal and Kourtit (2013) consider that the lack of resources and skilled labour are the main limiting factors for the implementation of the PM system. Wadong et al. (2010) consider that the level of education of managers and the lack of analytical skills of managers are the key limiting factors in the implementation of PM systems. In contrast to this statement, Todorović et al. (2015) believe that the characteristics of managers do not affect the choices and levels of implementation of the PM system. In accordance with the previous statements, the following research hypotheses were defined:

- *H6: The characteristics of the manager position in hotels have an impact on the implementation of the PM system.*
- *H7: The characteristics of managers' age have an impact on the implementation of the PM system.*
- *H8: The characteristics of managers' level of education have an impact on the implementation of the PM system.*
- *H9: The characteristics of managers' levels of work experience impact the implementation of the PM system.*

PM systems in the hotel industry during the Covid-19 era

Magnini et al. (2021) consider PM systems to be a key strategic instrument in hotel management during the Covid-19 pandemic. Implementing PM systems enables the development of sustainable economic strategies related to cost reduction, service innovation, competitiveness, and increased sales, which is what hotel managers strive for, especially during the Covid-19 pandemic (Radygina & Oshkordina, 2020).

At the beginning of the crisis, managers of tourism companies focused on the analysis of financial performance. The goal was to reduce the cost of hotel services and stimulate sales. As the duration of the epidemiological crisis lengthened, these strategies proved ineffective (Kukanja et al., 2020). In addition to relying on financial performance at the beginning of the Covid-19 pandemic, managers tried to use PM systems to predict trends in the hotel industry (Magnini et al., 2021). However, the

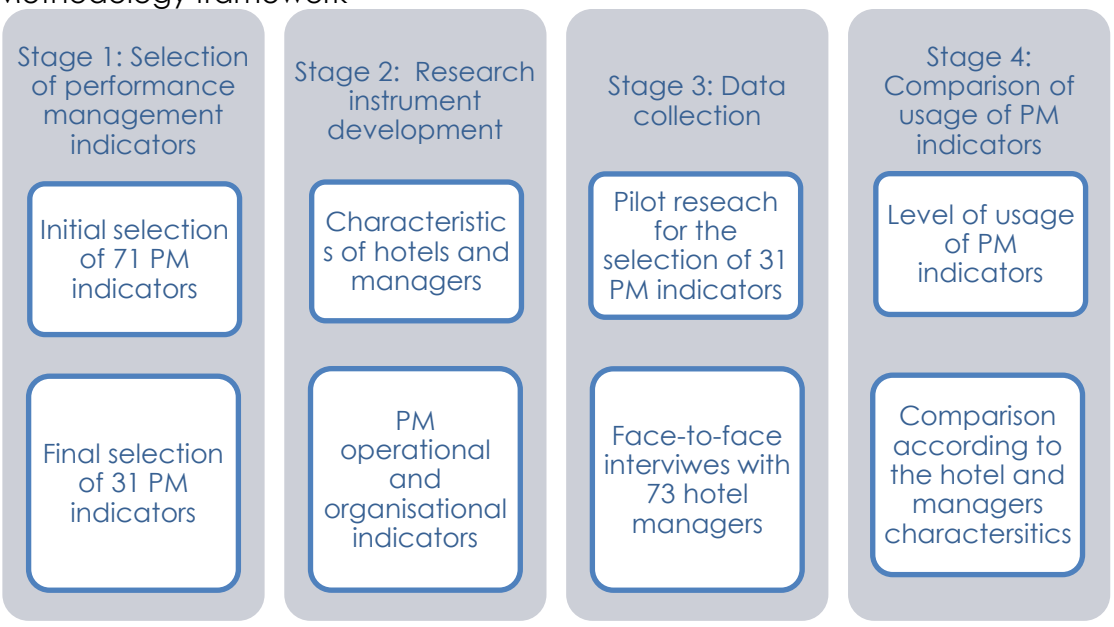
results show that even the most sophisticated predictions have large errors due to the radical disturbances in the market.

Client insecurity during the pandemic period caused a greater need for information and communication. Travel decisions were strongly influenced by information from the news and social media (Villacé-Molinero et al., 2021). Neuburger and Egger (2021) claim that media coverage plays a crucial role in the relationship between risk perception and travel intention. Hotel managers then focused on marketing activities (Lai & Wong, 2020). Marketing activities and the use of digital media are becoming primary for communication and attracting guests, which is why managers are increasingly interested in measuring the performance of digital advertising (Neuburger & Egger, 2021; Villacé-Molinero et al., 2021; Lai & Wong, 2020). Improving service in line with epidemiological standards is becoming significant in the hotel industry during the Covid-19 pandemic, with hotel managers increasingly interested in measuring performance related to guest satisfaction and protection (Yu et al., 2021). Since the costs of employees in the hotel industry make up 50% of the total costs, managers are also interested in the performance of employees in order to reduce costs and ensure efficient personnel management during the Covid-19 pandemic (Kukanja et al., 2020)Post-Covid-19 research reveals a continued trend in the hotel industry toward prioritising non-financial indicators. Several authors stress that the Covid-19 pandemic has been a catalyst for the development of non-financial analytics and the recognition of its significance in terms of hotel profitability (Németh & Gyurácz-Németh, 2022; Widz et al., 2022; Hao et al., 2020).

Methodology

The research process was conducted in 3 stages: (i) stage 1, which included the selection of performance management indicators; (ii) stage 2, which included the development of the research instrument based on the stage 1 results; (iii) stage 3, which included the data collection, and (iv) stage 4 that included comparison of the usage of PM indicators according to managers' and hotels' characteristics. Figure 1 presents the methodology framework.

Figure 1
Methodology framework



Source: Authors' work

Stage 1: Selection of performance management indicators

A review of the relevant literature identified 79 indicators of hotel performance (Rust et al., 2004; Bendle et al., 2015; Pnevmatikoudi & Stavrinoudis, 2016; Davis, 2007; Paine, 2007; Magnini et al., 2021; Lai & Wong, 2020; Fatima & Elbanna, 2020) used within the PM system. These indicators aim to measure the sustainable operation of the hotel, as they consider the key dimensions of sustainability (epidemiological, social and economic sustainability) (Obrenovic et al., 2020; Hristov & Chirico, 2019).

After defining a preliminary list of 79 indicators, a pilot study was conducted to determine the final list of indicators. Based on the pilot study, 31 indicators were selected, which were divided into two groups: organisational and operational indicators. The division into operational and organisational indicators is increasingly represented in the scientific literature and practice (Katsikeas et al., 2016). This division enables easier operationalisation of research. Operational indicators measure operational business activities related to user, service, advertising, and direct marketing indicators, while organisational indicators measure achieved financial, market, price, capacity utilisation and employee performance. Organisational indicators represent the cumulative values of the performance of various operational activities within business processes (Katsikeas et al., 2016). Within operational and organisational performance, both financial and non-financial indicators are represented. The list was modified in accordance with the strategic intentions of the hotel in the observed region, the business circumstances caused by the Covid-19 pandemic, the available resources, and the expectations of stakeholders. Table 1 presents the organisational and operational indicators examined in the research.

Table 1

Organisational and operational indicators selected for the research

Organisational indicators	Operational indicators
Net Profit	Customer retention rate
Return on Investment (ROI)	Customer Satisfaction
Return on Sales (ROS)	Net Promoter Score
Earnings Before Interest Taxes Depreciation Amortization (EBITDA)	Health Index of Client (HIC)
Market Demand	Customer Effort Score
Market Growth	Quality of Service
Occupancy Rate	Impressions
Average Daily Room Rate	Click
Revenue Per Available Room (RevPAR)	Reach
Room Cleaning	Click To Rate- CTR
Employee Satisfaction	Cost per Click- CPC
Sales Force Effectiveness	Conversions
Compensation	Rates of Conversion
Health Index of Employee (HIE)	Value of Conversion
	Cost of Direct Marketing Activities
	Percentage Sales with Direct Marketing
	Return of Marketing Investment ROMI

Source: Authors' work

Stage 2: Research instrument development

Four groups of questions were used in the survey.

- The first group referred to the characteristics of the hotel (size of the hotel, level of income, sales growth, and level of investment) and characteristics of the

hotel manager (age, level of education, work experience, and position in the hotel).

- The second group of questions was related to the level of implementation of chosen organisational and operational indicators. The questions within this group were formulated as follows: Do you implement the following indicator with answers Yes and No?
- The third group of questions refers to the attitudes of hotel managers about the usefulness of certain indicators in hotel management. On a scale of 1 (completely useless) to 5 (completely useful), managers rated the usefulness of each indicator.
- Within the fourth group of questions, hotel managers independently identified indicators not included in the survey but considered helpful in managing hotels during the Covid-19 pandemic.

Stage 3: Data collection

The empirical research presented in this paper is divided into two parts. First, the pilot research aimed to refine the list of performance indicators through interviews conducted with seven hotel managers. Second, the hotel managers of winter destinations in Serbia and Bosnia were interviewed face-to-face. Criteria for selecting managers who participated in creating the final list of indicators were their level of education, work experience in the position of strategic manager in the hotel industry, the size of the hotel they managed, and the financial results achieved in managed hotels. The research was conducted from December 2020 to February 2021.

The research involved 73 hotel managers who operate in winter destinations (Jahorina, Bjelašnica, Trebević, Vlašić, Kupres (Bosnia), and Kopaonik, Zlatibor, Tara, Divčibare (Serbia)), in Serbia and Bosnia. In Bosnia, 38 hotel managers were interviewed, while in Serbia, 35 hotel managers participated. Each manager represented one hotel, following the first-respondent research approach. Given the structure of the indicators used in this study, only hotel managers could provide answers because they have insight into the different areas of hotel business to which the selected indicators refer. Thus, a face-to-face survey with hotel managers was completed in each of the 73 hotels. The number of managers who participated in this study was influenced by the following factors: busyness of hotel managers and lack of free time to fill out the questionnaire, inability to establish face-to-face contact due to the epidemiological situation, inability to answer certain questions and reveal business secrets, weather and terrain configuration which prevented access to certain locations, seasonal business, and the presence of hotel managers only in certain periods. Also, it is necessary to take into account that the hotel industry in Bosnia and Serbia is in the process of rebuilding existing capacities and developing new capacities (hotels), especially after the destruction of the war. The number of 73 hotel managers makes up about 69% of the total market of the hotel industry of winter destinations in Serbia and Bosnia.

The characteristics of hotel managers who participated in the study are presented in Table 2. Descriptive data is provided for Serbia and Bosnia, as well as for the overall sample. Among the executives, 40 hotel owners (54.8%) and 33 hotel top managers (45.2%) were involved. There were 45.2% of hotel managers under the age of 45 and 54.5% of managers over the age of 45. The threshold of 45 was chosen for two reasons: to have equal groups to compare and to divide respondents into Generation X and Generation Y. Most managers have a university education. In contrast, when it comes to work experience, most hotel managers have less than 10 years of work experience in the hotel industry.

Table 2
Sample descriptive data Serbia, Bosnia and for the overall sample

Characteristics	Categories	Serbia		Bosnia		N	%
		N	%	N	%		
The position of the respondents in the hotel	Hotel owner	22	56.4	18	52.9	40	54.8
	Hotel top manager	17	43.6	16	47.1	33	45.2
Age of the respondent	Less than 45 years (Generation Y)	20	51.3	13	38.2	33	45.2
	45 years and more (Generation X)	19	48.7	21	61.8	40	54.8
Educational attainment of the respondents	High school	3	7.7	/	/	3	4.1
	College degree	10	25.6	8	23.5	18	24.7
	Master's degree	15	38.5	16	47.1	31	42.5
	PhD	11	28.2	10	29.4	21	28.8
Work experience of the respondents	Less than 10 (years)	5	12.8	4	11.8	9	12.3
	From 10 to 20 (years)	10	25.6	13	38.2	23	31.5
	More than 20 (years)	24	61.5	17	50.0	41	56.2

Source: Authors' work

The characteristics of the hotels whose managers participated in this research are shown in Table 3. In total, 50 (68.6%) hotels generated revenue greater than $500,000, and less than $500,000 was generated by 23 (31.5%) hotels. Most hotels had sales growth of 1 to 3% in the last three years. When it comes to hotel investment levels, most hotels have invested less than $ 25,000 in the last three years. When it comes to the size of hotels on the market in Bosnia and Serbia, small hotels operate the most.

Table 3
Features of the hotels whose managers participated in the study

Hotel features	Categories	Serbia		Bosnia		N	%
		N	%	N	%		
Hotel income (yearly)	Less than $500,000	11	28.2	12	35.3	23	31.4
	More than $500,000	28	71.8	22	64.7	50	68.6
Sales growth (yearly)	Less than 1%	8	20.5	10	29.4	18	24.7
	from 1 to 3%	19	48.7	11	32.4	30	41.1
	More than 3 %	12	30.8	13	38.2	25	34.2
The level of investment in the hotel in the last three years	Less than $25,000	7	17.9	5	14.7	12	16.4
	from $25,000 to $50,000	9	23.1	9	26.5	18	24.7
	More than $50,000	23	59.0	20	58.8	43	58.9
Number of rooms in the hotel	Less than 25	8	20.5	8	23.5	16	21.9
	from 25 to 50	10	25.6	7	20.6	17	23.3
	More than 50	21	53.8	19	55.9	40	54.8
Number of hotel employees	Less than 25	8	20.5	9	26.5	17	23.3
	From 25 to 50	9	23.1	7	20.6	16	21.9
	More than 50	22	56.4	18	52.9	40	54.8

Source: Authors' work

Stage 4: Comparison of the usage of PM indicators according to managers' and hotels' characteristics

In stage 4, the use of PM indicators was compared using the Mann-Whitney and Kruskal-Wallis tests according to the characteristics of managers and hotels.

Results

Level of PM indicators usage

The research identified organisational indicators used by hotel managers (Table 4). The most used indicators are Net profit, Average Daily Room Rate, Compensation, Occupancy Rate, Return on Sales (ROS), and Market Demand.

Table 4
Levels of usage of organisational indicators in surveyed hotels

Organisational indicators	# of hotels	%
Net Profit	73	100
Return on Investment (ROI)	64	87.7
Return on Sales (ROS)	68	93.2
Earnings Before Interest Taxes Depreciation Amortization (EBITDA)	33	45.2
Market Demand	68	93.2
Market Growth	53	72.6
Occupancy Rate	69	94.5
Average Daily Room Rate	70	95.9
Revenue Per Available Room (RevPAR)	48	65.8
Room Cleaning	64	87.7
Employee Satisfaction	44	60.3
Sales Force Effectiveness	59	80.8
Compensation	70	95.9
Health Index of Employee (HIE)	38	52.1

Source: Authors' work

The research also observed operational indicators used by hotel managers (Table 5). The most used operational indicators are Customer Satisfaction, Return of Marketing Investment (ROMI), Customer Effort Score, Quality of Service, and Click.

Table 5
Levels of usage of operational indicators in surveyed hotels

Operational indicators	# of hotels	%
Customer retention rate	59	80.8
Customer Satisfaction	70	95.9
Net Promoter Score	50	68.5
Health Index of Client (HIC)	43	58.9
Customer Effort Score	68	93.2
Quality of Service	65	90.4
Impressions	58	79.5
Click	64	87.7
Reach	62	84.9
Click To Rate- CTR	39	53.4
Cost per Click- CPC	34	46.6
Conversions	40	54.8
Rates of Conversion	46	63.0
Value of Conversion	47	64.4
Cost of Direct Marketing Activities	55	75.3
Percentage Sales with Direct Marketing	54	74.0
Return of Marketing Investment ROMI	69	94.5

Source: Authors' work

Relationship between the usage level and attitudes about the usefulness of PM indicators (H1)

The research analysed managers' attitudes towards the usefulness of organisational and operational indicators during the Covid-19 pandemic. On a scale from 1 (completely useless) to 5 (completely useful), hotel managers rated each indicator (Table 6). Based on the presented results, it can be concluded that hotel managers at the time of the pandemic considered operational indicators more useful than organisational indicators.

Table 6
Managers' attitudes about the usefulness of organisational and operational indicators

Type of indicator	Indicator	Mean ± Std
Organisational indicators	Net Profit	2.73 ± 0.769
	Return on Investment (ROI)	2.71 ± 0.735
	Return on Sales (ROS)	2.75 ± 0.795
	Earnings Before Interest Taxes Depreciation Amortization (EBITDA)	2.98 ± 0.841
	Market Demand	3.76 ± 0.589
	Market Growth	3.76 ± 0.589
	Occupancy Rate	4.26 ± 0.500
	Average Daily Room Rate	4.43 ± 0.477
	Revenue Per Available Room RevPAR	4.41 ± 0.641
	Room Cleaning	4.79 ± 0.408
	Employee Satisfaction	4.43 ± 0.577
	Sales Force Effectiveness	4.58 ± 0.573
	Compensation	3.71 ± 0.824
	Health Index of Employee (HIE)	3.63 ± 0.677
Operational indicators	Customer retention rate	4.19 ± 0.461
	Customer Satisfaction	4.89 ± 0.393
	Net Promoter Score	4.71 ± 0.513
	Health Index of Client (HIC)	3.90 ± 0.819
	Customer Effort Score	4.38 ± 0.679
	Quality of Service	4.93 ± 0.304
	Impressions	4.30 ± 0.638
	Click	4.30 ± 0.660
	Reach	4.34 ± 0.628
	Click To Rate- CTR	4.24 ± 0.662
	Cost per Click- CPC	4.27 ± 0.629
	Conversions	4.36 ± 0.634
	Rates of Conversion	4.38 ± 0.637
	Value of Conversion	4.35 ± 0.631
	Cost of Direct Marketing Activities	4.65 ± 0.582
	Percentage Sales with Direct Marketing	4.65 ± 0.582
	Return of Marketing Investment ROMI	4.72 ± 0.583

Source: Authors' work

We also observed whether there are differences between hotel managers' attitudes on the usefulness of certain organisational and operational indicators and the level of their implementation, as shown in Table 6 and Table 7. To explore the differences, the Mann-Whitney (MW) test was employed in both cases.

For organisational indicators, differences were found in Return on Sales (ROS), Revenue Per Available Room (RevPAR), Employee Satisfaction, and Sales Force Effectiveness (Table 7).

Table 7
Difference in the attitudes of managers about the usefulness of organisational indicators based on their implementation

Organisational indicators	Mann-Whitney test	Mean ± Std.	
		Use	Do not use
Net Profit	/	/	/
Return on Investment (ROI)	-1.464	2.67 ± 0.757	3.00 ± 0.500
Return on Sales (ROS)	-1.955*	2.70 ± 0.792	3.40 ± 0.547
Earnings Before Interest Taxes Depreciation Amortization (EBITDA)	-1.446	2.87 ± 0.992	3.07 ± 0.693
Market Demand	-0.618	3.77 ± 0.594	3.60 ± 0.547
Market Growth	-1.465	3.69 ± 0.540	3.95 ± 0.686
Occupancy Rate	-1.138	4.27 ± 0.511	4.00 ± 0.000
Average Daily Room Rate	-1.268	4.35 ± 0.482	4.00 ± 0.000
Revenue Per Available Room (RevPAR)	-3.262**	4.60 ± 0.494	4.04 ± 0.734
Room Cleaning	-0.109	4.79 ± 0.407	4.77 ± 0.440
Employee Satisfaction	-2.361*	4.56 ± 0.501	4.21 ± 0.629
Sales Force Effectiveness	-2.893**	4.67 ± 0.539	4.21 ± 0.578
Compensation	-1.006	3.72 ± 0.832	3.33 ± 0.577
Health Index of Employee (HIE)	-1.844	3.76 ± 0.633	3.48 ± 0.677

Note: *p<0.05, ** p<0.001
Source: Authors' work

For operational indicators, there is no link between managers' attitudes about their usefulness and the level of their implementation in Customer retention rate, Health Index of Client (HIC), and Customer Satisfaction (Table 8). However, it was found that there is a link between the level of use of certain operational indicators and the attitudes of hotel managers about their usefulness.

Table 8
Differences in the attitudes of managers about the usefulness of operational indicators based on their implementation

Operational indicators	Mann-Whitney test	Mean ± Std. Deviation	
		Use	Do not use
Customer retention rate	-0.159	4.18 ± 0.472	4.21 ± 0.425
Customer Satisfaction	-1.722	4.91 ± 0.329	4.33 ± 1.154
Net Promoter Score	-3.928**	4.86 ± 0.404	4.39 ± 0.583
Health Index of Client (HIC)	-0.322	3.93 ± 0.827	3.86 ± 0.819
Customer Effort Score	-3.666**	4.67 ± 0.588	4.12 ± 0.656
Quality of Service	-1.140	4.95 ± 0.209	4.71 ± 0.755
Impressions	-3.512**	4.44 ± 0.535	3.73 ± 0.703
Click	-2.827**	4.39 ± 0.607	3.66 ± 0.707
Reach	-2.297*	4.41 ± 0.588	3.90 ± 0.700
Click To Rate- CTR	-3.755**	4.51 ± 0.601	3.94 ± 0.600
Cost per Click- CPC	-4.784**	4.64 ± 0.485	3.94 ± 0.559
Conversions	-4.910**	4.70 ± 0.464	3.96 ± 0.585
Rates of Conversion	-4.770**	4.65 ± 0.525	3.92 ± 0.549
Value of Conversion	-4.795**	4.61 ± 0.533	3.88 ± 0.515
Cost of Direct Marketing Activities	-5.266**	4.86 ± 0.404	4.05 ± 0.639
Percentage Sales with Direct Marketing	-5.418**	4.87 ± 0.390	4.05 ± 0.621
Return of Marketing Investment ROMI	-2.473*	4.79 ± 0.439	3.50 ± 1.290

Note: *p<0.05, ** p<0.001
Source: Authors' work

Comparison of PM indicators usage according to hotel characteristics (H2-H5)

The following analysis, using the Kruskal-Wallis Test, analysed whether there are differences in levels of implementation of organisational and operational indicators based on the size of the hotel (Table 9). The size of the hotel is determined based on the number of rooms and the number of employees. Small hotels had less than 25 rooms and 25 employees. Medium hotels had between 25 and 50 rooms and between 25 and 50 employees. Large hotels had more than 50 rooms and more than 50 employees.

Table 9
Differences in the levels of application of the PM system and the size of the hotel

Type of indicators	Mean ± St. Dev.			Kruskal-Wallis H
	Large hotels	Medium hotels	Small hotels	
Organisational indicators	18.10 ± 2.53	16.17 ± 1.70	14.00 ± 0.00	35.67**
Operational indicators	24.50 ± 4.93	21.29 ± 6.49	17.00 ± 0.00	29.68**

Note: ** p<0.001
Source: Authors' work

The results show that there are differences in the levels of organisational and operational indicators applied based on the size of the hotel. Large hotels used the most performance indicators, followed by medium-sized hotels and small hotels. The Man-Whitney U Test was again employed to examine whether there were differences in the levels of application of organisational and operational indicators based on hotel revenues. The results show that hotels with higher revenues measure more indicators compared to hotels with lower revenues (Table 10).

Table 10
Differences in the levels of application of the PM system based on annual hotel revenues

Type of indicators	Mean ± St. Dev.		Mann-Whitney test
	More than $500,000	Less than $500,000	
Organisational indicators	19.52 ± 2.10	15.48 ± 1.70	-5.872**
Operational indicators	27.60± 5.12	19.58 ± 3.75	-5.697**

Note: ** p<0.001
source: authors' work

Using the Kruskal-Wallis Test, it was examined whether there are differences in the levels of application of organisational and operational indicators based on hotel sales growth over the past three years. The results show that hotels that achieved higher sales growth rates measure more indicators compared to hotels that achieved lower sales growth rates (Table 11).

Table 11
Differences in the levels of application of the PM system based on hotel sales growth

Type of indicators	Mean ± St. Dev.			Kruskal-Wallis H
	More than 3 %	From 1 to 3%	Less than 1%	
Organisational indicators	19.68 ± 1.74	15.93 ± 1.41	14.05 ± 0.23	55.48**
Operational indicators	26.76 ± 3.73	21.16 ± 5.68	17.22 ± 0.94	41.28**

Note: ** p<0.001
Source: Authors' work

The following analysis, using the Kruskal-Wallis Test, examined whether there are differences in the levels of application of organisational and operational indicators based on the level of hotel investment in the past three years. The results show that hotels that measured more indicators had higher levels of investment, while hotels that measured fewer indicators had lower investment (Table 12).

Table 12
Differences in the levels of application of the PM system based on investment levels

Type of indicators	Mean ± St. Dev.			Kruskal-Wallis H
	More than $50,000	From $25,000 to $50,000	Less than $25,000	
Organisational indicators	18.30 ± 2.30	14.88 ± 1.02	14.00 ± 0.00	44.42**
Operational indicators	26.23 ± 5.29	18.05 ± 2.15	17.00 ± 0.00	40.41**

Note: ** p<0.001
Source: Authors' work

Comparison of PM indicators usage according to managers' characteristics (H6-H9)

The research examined whether managers' characteristics (position, age, level of education, and level of work experience) impact the implementation of the PM system. Using the Mann-Whitney U Test, it was examined whether there are differences in the levels of application of organisational and operational indicators and positions in the hotel. The results show that top hotel managers measure more indicators than hotel owners (Table 13).

Table 13
Differences in the levels of application of the PM system based on the position of the respondent

Type of indicators	Mean ± St. Dev.		Mann-Whitney test
	The owner	Top manager	
Organisational indicators	15.85 ± 2.48	17.84 ± 2.39	-3.648**
Operational indicators	19.85 ± 4.43	24.87 ± 5.73	-4.143**

Note: ** p<0.001
Source: Authors' work

Using the Man-Whitney U Test, it was examined whether there are differences in the levels of application of organisational and operational indicators and the age of the respondents. The results show that top hotel managers under the age of 45 measure more indicators than managers over the age of 45 (Table 14).

Table 14
Differences in the levels of application of the PM system based on the age of the respondent

Type of indicators	Mean ± St. Dev.		Mann-Whitney test
	More than 45 years	Less than 45 years	
Organisational indicators	15.80 ± 2.04	17.90 ± 2.82	-3.242**
Operational indicators	20.15 ± 5.27	24.48 ± 5.17	-3.679**

Note: ** p<0.001
Source: Authors' work

Using the Kruskal-Wallis Test, it was also explored whether there are differences in the levels of application of organisational and operational indicators and the work experience of the respondents. The results show that hotel managers with less than 10 years of work experience measure more indicators than managers who have more than 10 years of work experience (Table 15).

Table 15
Differences in the levels of application of PM based on the work experience of managers

Type of indicators	Mean ± Std			Kruskal-Wallis H
	More than 20 years	From 10 to 20 years	Less than 10 years	
Organisational indicators	15.82 ± 2.24	17.08 ± 2.46	20.11 ± 1.69	18.560**
Operational indicators	20.56 ± 5.39	22.39 ± 4.94	28.44 ± 3.87	16.200**

Note: ** p<0.001
Source: Authors' work

Using the Kruskal-Wallis Test, it was analysed whether there are differences in the levels of application of organisational and operational indicators and the level of education of the respondents. The results show that hotel managers who have completed doctoral studies measure upwards of indicators, and then by measurement levels are managers who have completed master studies. Managers with a secondary education measured more indicators than managers with a bachelor's degree (Table 16).

Table 16
Differences in the levels of application of PM based on the educational attainment of respondents

Type of indicators	Mean ± Std				Kruskal-Wallis H
	High school	College	Master	PhD	
Organisational indicators	15.66 ±1.52	14.83 ±1.85	16.64 ±2.44	18.71 ±2.28	25.10**
Operational indicators	22.66 ±5.13	18.33 ±3.19	21.67 ±6.01	25.90 ±4.49	23.44**

Note: ** p<0.001
Source: Authors' work

Discussion

The following table (Table 17) shows the summary results of the research and tested set of research hypotheses. The research results show that H1 is rejected in the case of organisational indicators (there is no connection between the level of implementation of organisational indicators and managers' views on the usefulness of organisational indicators in hotel management). As part of the research results, the analyses are presented for individual organisational indicators, and the obtained values show that for most individual organisational indicators, there is no statistically significant result for these analyses. When it comes to operational indicators, with many indicators of individual operational indicators, statistically significant results were obtained,

so H1 in the case of operational indicators is confirmed (there is a connection between the level of implementation of operational indicators and the views of hotel managers about their usefulness). Hotel managers who had a more positive attitude about the usefulness of the indicators used them more than managers who had a less positive attitude. H2, H3, H4 and H5 were confirmed, which shows that there is a relationship between hotel characteristics such as size, revenues, sales growth investment level and the level of PM system implementation. H6, H7, H8 and H9 were confirmed, which shows that there is a relationship between manager characteristics such as position, age, level of education and work experience and the level of PM system implementation.

Table 17
Aggregated results of the conducted hypothesis testing

Research hypotheses	Hypothesis testing on organisational indicators	Hypothesis testing on operational indicators
Attitudes of managers		
H1: There is a link between the level of use of certain operational indicators and the attitudes of hotel managers about their usefulness.	4/14 ∅ Less than half of relationships are positive	13/17 ✓ More than half of relationships are positive
Characteristics of the hotel		
H2: There are differences in levels of implementation of organisational and operational indicators based on the size of the hotel.	✓ (1%) Larger hotels	✓ (1%) Larger hotels
H3: There are differences in the levels of implementation of organisational and operational indicators based on hotel revenues.	✓ (1%) Higher revenue	✓ (1%) Higher revenue
H4: There are differences in the levels of implementation of organisational and operational indicators based on the growth of hotel sales in the past three years.	✓ (1%) Higher growths	✓ (1%) Higher growths
H5: There are differences in the levels of implementation of organisational and operational indicators based on the level of hotel investment in the past three years.	✓ (1%) Higher investments	✓ (1%) Higher investments
Characteristics of the managers		
H6: The characteristics of the manager position in hotels have an impact on the implementation of the PM system.	✓ (1 %) Top managers	✓ (1 %) Top managers
H7: The characteristics of managers' age an impact on the implementation of the PM system	✓ (1 %) Youngers managers	✓ (1 %) Youngers managers
H8: The characteristics of managers' level of education have an impact on the implementation of the PM system.	✓ (1 %) Higher education	✓ (1 %) Higher education
H9: The characteristics of managers' level of work experience have an impact on the implementation of the PM system.	✓ (1 %) Less experience	✓ (1 %) Less experience

Note: % is significance level of hypothesis acceptance
Source: Authors' work

This research shows the practice of measuring the performance of hotels in winter destinations in Serbia and Bosnia during the Covid-19 pandemic. In the first part of the research, organisational and operational indicators used by managers within hotel management were identified. The results show that the following indicators were most often used: Net Profit, Return on Sales (ROS), Market Demand, Occupancy Rate, Average Daily Room Rate, Compensation, Customer Satisfaction, Net Promoter Score, Customer Effort Score, Quality of Service, Click, Return of Marketing Investment (ROMI). Based on the presented results, it can be concluded that most managers use basic financial measures such as Net Profit, Compensation and Return on Sales (ROS) but that the application of non-financial measures such as Customer Satisfaction and Quality of Service does not lag the application of financial criteria. These results are consistent with the results presented by relevant research in the field of performance measurement (Neuburger & Egger, 2020; Villac´e-Molinero et al., 2021; Lai & Wong, 2020; Yu et al., 2021). In the age of the Covid-19 pandemic, hotel managers are increasingly relying on non-financial metrics such as service metrics, customer metrics, digital advertising activity metrics, and employee-related metrics. Also, in this study, hotel managers independently singled out indicators that they considered useful in hotel management during the Covid-19 pandemic. At the time of the pandemic, hotel managers used the following indicators: client profitability was used by 45.2% of the sample, duration of training of hotel employees by 31.5%, discounted price by 43.8%, costs of coupons, rebates, and advertising materials by 19.2%, percentage of sales with coupons, rebates 20.5% also use advertising materials. Metrics that hotel managers have independently identified as useful in hotel management further strengthen the results of this research and the results presented by the relevant literature that non-financial metrics are used more than financial metrics during the Covid-19 pandemic.

After identifying the indicators used in hotel management within this research, managers' attitudes on the usefulness of organisational and operational indicators were examined. The results of this study show that hotel managers, at the time of the Covid-19 pandemic, considered operational indicators more useful in hotel management compared to organisational indicators. Relevant literature on managerial attitudes about PM systems at the time of the Covid-19 pandemic is scarce or limited. Wang and Huang (2021) believe that the effects of the implementation of operational indicators within hotel management are exceptional and that hotel managers strive to achieve superior operational performance. The implementation of operational indicators removes the "short-sightedness" of managers, enabling the selection of areas for development and investment in accordance with market circumstances and hotel opportunities (Katsikeas et al., 2016).

This study examined whether there was a link between the attitudes of hotel managers regarding the usefulness of organisational and operational indicators and the level of their implementation during the Covid-19 pandemic. The existence of a link between managers' attitudes about the usefulness of indicators and levels of indicator implementation was determined for the following organisational indicators: Return on Sales (ROS), Revenue Per Available Room (RevPAR), Employee Satisfaction, and Sales Force Effectiveness. When it comes to operational indicators, the existence of a relationship between managers' attitudes about the usefulness and levels of implementation was found for the following indicators: Net Promoter Score, Customer Effort Score, Quality of Service, Impressions, Click, Reach, Click To Rate- CTR, Cost per Click - CPC, Conversions, Rates of Conversion, Value of Conversion, Cost of Direct, Marketing Activities, Percentage Sales with Direct Marketing and Return of Marketing

Investment (ROMI). Managers who had more positive attitudes about the usefulness of these indicators measured them more compared to managers who had a less positive attitude about the usefulness of these indicators. Various studies show that managers 'attitudes are related to their analytical skills, pointing to a lack of analytical skills and the need to educate managers regarding the implementation of key performance indicators (de Waal & Kourtit, 2013).

The research identified whether there is a link between the level of implementation of the PM system and the characteristics of the hotel, such as the size of the hotel, the level of revenue that the hotel generates, sales growth in the last three years and the level of investment in the last three years. The results showed that larger hotels use more operational and organisational indicators compared to smaller hotels. Also, the results show that hotels that measured more organisational and operational indicators within hotel management achieved higher revenues, higher sales growth and higher levels of investment. Relevant literature before the start of the Covid-19 pandemic shows that there is a link between the level of implementation of the PM system and the size of hotels, i.e., that larger hotels measure more indicators than smaller hotels (Hudson et al., 2001; Odar et al., 2012). The results of various studies have confirmed that there is a link between business results (revenue and sales growth), level of investment and level of implementation of the PM system, i.e., hotel managers who use more organisational and operational indicators have better business outcomes and invest more in hotels and hotel business (Zigan & Zeglat, 2010; Pnevmatikoudi & Stavrinoudis, 2016; Sainaghi et al., 2013; Pingitore et al., 2010). The results of this research show what represents the relevant literature that PM systems are associated with the improvement of services, innovation, competitiveness, and profitability of hotels (Sharma et al., 2021; Magnini et al., 2021; Wadongo et al., 2010; Philips et al., 2005; Jugović et al., 2022). Bendle et al. (2015) consider that PM systems represent a management instrument that allows managers to determine the current position of the company and the position where the company wants to be, as well as ways to achieve goals. To improve the level of implementation of the PM system, hotel managers are advised to use their hotel management resources (human and operational) and combine them with those of IT (digital skills), to develop business value (Klada et al., 2024; Mihajlović et al., 2024).

This study also examined whether the characteristics of the hotel manager, such as the position in the hotel, the age of the manager, the level of education, and the level of work experience, affect the implementation of the PM system. The results showed that there is a relationship between the position held in the hotel and the level of PM. Top hotel managers measured more indicators than hotel owners. Relevant research prior to the Covid-19 pandemic indicates that hotel managers use PM systems not only as instruments to control and improve business but also to justify certain management decisions before boards (Bendle et al., 2015). The results show that the age of hotel managers also influenced the levels of implementation of the PM system. Managers under the age of 45 used more indicators compared to managers over the age of 45. The existence of a connection between the level of work experience of managers and the level of implementation of the PM system was also determined. Most indicators were used by managers who had less than 10 years of work experience and the least by managers who had more than 20 years of work experience. Relevant literature indicates that PM systems are management instruments of modern management, and the beginning of their development in the hotel industry was recorded in the late twenties (Phillips et al., 2005). Traditional PMs that relied on financial results were instruments of the centralised accounting systems of communist societies and were used until the mid-1990s when the need to redesign them was

recognised. Older managers who gained knowledge and experience during the communist regimes, when management systems were based exclusively on legally prescribed financial criteria, still apply them today and find it more difficult to redesign them. Unlike older managers, younger managers recognise the importance of modern, balanced (equal application of financial and non-financial indicators) PM systems and implement them in hotel management processes (Uddin et al., 2020).

It was also examined whether there is a connection between the level of education of hotel managers and the level of implementation of the PM system. The results showed that managers with completed doctoral studies measure the most indicators, followed by managers with master's studies. After managers with master's studies are managers with a high school diploma. Managers with a university education measured the least indicators. The results of other research indicated that the level of education of the manager had an impact on the levels of implementation of certain indicators within the PM system (de Waal & Kourtit, 2013).

Conclusion

The Covid-19 pandemic has caused changes in the hotel and hospitality industry's business, for example restaurants turned to offering private dining (Slivar, 2022). The goal of hotel managers was to enable sustainable, economical hotel operations. Satisfaction, safety, guest protection and communication through digital media have become the focus of interest of hotel managers. These changes also affected the hotel industry's PM systems in the CEE region. This study presents the practice of measuring organisational and operational indicators during the Covid-19 pandemic in the CEE region (Serbia and Bosnia). The results of the research show that in the era of the Covid-19 pandemic, hotel managers relied on both financial and non-financial measures. Although various studies before the start of the Covid-19 pandemic indicated a higher prevalence of financial indicator measurements in CEE companies during the Covid-19 pandemic period, the application of non-financial indicators does not lag behind the application of financial indicators. Research conducted after the Covid-19 pandemic indicates a higher prevalence of non-financial measures in hotel management, which indicates the fact that the results of this research can serve as a basis for the development of a performance measurement system in the hotel industry in the post-pandemic period.

The research identified managers' attitudes toward the usefulness of the PM system in hotel management during the Covid-19 pandemic. The results of this study show that hotel managers in the CEE region find operational indicators more useful than organisational indicators in hotel management during the pandemic. Based on the results of this study, it can be concluded that during the Covid-19 pandemic, managers' awareness of the usefulness of operational indicators in hotel management is growing. In the framework of this research, whether there is a connection between the attitudes of managers and the levels of implementation of certain organisational and operational indicators was examined. The results showed that there is no connection between the level of implementation of organisational indicators and the attitudes of managers, so H1 is rejected in the case of organisational indicators. When it comes to operational indicators, the results of the research show that there is a connection between the level of implementation of operational indicators and the level of managers, and hypothesis H1 in the case of operational indicators is confirmed.

The efficiency of the PM system is expressed through an increase in revenue, sales growth rate and investment in hotels. This study also showed that there is a link between business performance (revenue and sales growth) and the PM system. Hotel

managers who measured more indicators achieved better business results than managers who measured fewer indicators. The results of the research also showed that managers who used more indicators invested more in hotels and hotel business processes. In accordance with the previous statements, the results of this research show that H2, H3, H4, and H5 are confirmed. The results of this study show that the characteristics of managers, such as business position in the hotel, age, level of education and level of work experience, are related to the choice of indicators and levels of their implementation, which indicates that H6, H7, H8 and H9 are confirmed.

A potential limitation of this study is the sample size. The size of the sample was determined by the structure of the sample (managers of winter destination hotels) and the fact that the owner or top manager who manages each hotel participated in the research. Opportunities to improve research were identified during this study. This study did not consider the synergistic effects of various internal and external factors on the choice of operational and organisational indicators.

Future directions of the study could be foreseen. One can explore the differences between the attitudes of managers in Serbian and Bosnian winter hotels regarding the implementation of PM systems. Another possible direction of the study could be to extend the sample and cover winter destination hotels in other CEE countries such as Montenegro and Albania. Also, it might be of interest to segment the winter hotels in CEE based on their level of PM using clustering algorithms (Nikolic et al., 2023). Also, advanced multivariate analysis and machine learning algorithms can be implemented to rank winter destinations (Maričić et al., 2019). The conducted research contributes to the field of performance measurement in tourism industry in the CEE region by providing insights on the situation within winter destination hotels.

We hope that the presented research will initiate further research on attitudes and factors that lead to the higher implementation of PM in the tourism industry in CEE.

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