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Abstract: The study is aimed at developing a resilient benchmarking system for small hotels in Ukraine, designed to ensure their survival and growth amid global disruptions and local crises. Given the severe challenges associated with the COVID-19 pandemic and military actions, the resilience of the regional tourism business becomes particularly relevant. The methods used in the study, including factor and cluster analysis, the method of taxonomy, and dendrograms, have enabled the development of development programs for two clusters of hotels: those located in areas with increased military risk and those in relatively safe territories. The taxonomic analysis revealed significant differences in managerial practices and operational efficiency, largely determined by the geographic location of the hotels. Hotels in active combat zones experience a 40% reduction in tourist flow and financial instability, while hotels in safe areas demonstrate a 30% higher level of customer satisfaction. The application of advanced security systems and modern marketing techniques has led to a 40% reduction in incidents.

Keywords: resilient benchmarking; small hotels; tourism; regional impact; operational efficiency; strategic adaptation

1. Introduction

Ukraine, possessing a rich tourism potential including seaside leisure, mountain tourism, sports skiing, sanatorium-resort complexes, and historical landmarks, has faced significant challenges in recent years due to COVID-19 and military actions. Despite these challenges, domestic tourism in regions distant from the main conflict zones, such as Lviv and Zakarpattia, has shown a 25% increase in tourism tax compared to 2021. However, regions in active conflict zones like Kherson, Luhansk, and Donetsk have experienced a substantial decrease in tax revenues, reaching figures of -92%, -88%, and -72% respectively. In this context, creating a resilient benchmarking system for small hotels becomes critically important for ensuring their survival and growth during global disruptions. Such a system should include comprehensive measures to adapt to changing market conditions, minimize financial losses, and optimize resources. For small hotels located in captured or de-occupied regions, it is critical to develop strategies to attract domestic tourists and adapt offerings to the needs of temporarily displaced persons. For example, applying differentiated pricing policies, developing special service packages aimed at extended stays, and enhancing security measures can become key success factors. Moreover, considering the increased interest in tourism in the safer western regions,

small hotels should focus on improving service quality, developing infrastructure, and strengthening partnerships with local attractions and businesses to create attractive tourist products. The resilient benchmarking system should also include monitoring and analyzing data on tourist flow, revenues from tourism activities, and customer satisfaction levels. These data will help hotels quickly respond to changing conditions and make informed managerial decisions. Thus, the development and implementation of an effective resilient benchmarking system will be key to the survival and further development of small hotels in Ukraine in an era of global and local crises.

1.1. Literature Review

For the analysis of specialized literature, it should be grouped based on thematic research directions in the hotel and tourism business. Six key groups can be identified, reflecting the efficiency, quality of management, and sustainability of hotels; the use of CRM, digitalization, and customer relationships; improving environmental sustainability and the use of "green" practices; service quality and customer loyalty and the importance of technical maintenance, energy, and other resource management (Campos et al. 2024, Crespo et al. 2023). Regarding the first group, concerning efficiency and quality management, Altin et al. (2018) focus on performance management, Arbelo-Pérez et al. (2017) investigate the impact of quality on performance evaluations, Cesarotti and Spada (2009) describe a systematic approach to operational excellence, Dutescu et al. (2014) analyze key performance indicators, Santos et al. (2022) propose a system for evaluating the performance of Portuguese hotels, Lockyer (2002) studies hotel selection factors, Longart (2020) analyzes service management systems, Ferrer (2004) considers control process management, Jones et al. (2016) discuss sustainability in the hotel industry, and Prud'homme and Raymond (2013) show the impact of sustainable development on customer satisfaction. The second group of studies focuses on the use of CRM, digitalization, and customer relationships. This group includes the work of Bang and Kim (2013), who investigate the impact of CRM on relationship quality in the hotel industry. Khalila et al. (2023) analyze the impact of big data analytics capabilities, organizational agility and innovation on hotel performance after COVID-19. Mann, R. (2001) developed an online resource for comparative analysis and performance improvement. Kim and Han (2020) study the attributes of a "smart" hotel and their impact on customer intentions. Meng and Gao (2019) consider consumer preferences for online hotel booking. Park and Lee (2021) developed a decision support system for evaluating service quality based on social media reviews. These studies highlight the importance of technological innovation and service quality in the modern hotel industry. The third group of publications is dedicated to environmental sustainability and "green" practices in the hotel business. Bastič and Gojčič (2012) investigate tourists' environmental expectations, Calveras (2003) analyzes incentives for investment in environmental quality, Chia-Jung and Pei-Chun (2014) evaluate preferences for "green" characteristics, Becerra-Vicario et al. (2022) study the link between environmental and financial performance, and Hussain et al. (2019) emphasize the impact of integrated practices on sustainable supply chain operations. Khatter (2023) and Kassinis and Soteriou (2015) demonstrate how environmental sustainability contributes to improved customer satisfaction and sustainable development in the hotel industry, which is critically important for small hotels in the face of global competition. The fourth group of publications is dedicated to service quality and customer loyalty in hotels. Cham and Easvaralingam (2012) studied the relationship between service quality, image and customer loyalty in Malaysian hotels. Davras and Caber (2019) investigated the symmetric and asymmetric effects of hotel services on customer satisfaction, although their study is limited to one golf hotel in Turkey. Laguardia et al. (2021) analyzed maintenance management in hotels for people with disabilities. Liat et al. (2014) investigated the relationship between service quality, corporate image, customer satisfaction and their loyalty. Modica et al. (2020) studied consumer perceptions of sustainable practices in the supply chain and their impact on customer satisfaction and loyalty. Min and Min (2006) compared the perception of service quality from the perspective of managers and customers. Mmutle and Shonhe (2017) investigated customer perceptions of service quality and its impact on hotel reputation. Nair and Choudhary (2016) studied the impact of service quality on hotel business performance in Qatar. Bang and Kim (2013) emphasized the importance of customer

relationship management systems for improving service quality. Kandampully et al. (2011) highlighted the importance of service quality and corporate image in building customer loyalty. The fifth group of publications focuses on maintenance and resource management in hotels. Chan et al. (2003) examine maintenance practices and energy consumption in hotels. Cunha and Oliveira (2020) analyze ways to achieve nearly zero energy consumption in Portuguese hotels. Ghazi (2016) considers maintenance management methods in Egyptian hotels. Lai (2016) and Lai and Yik (2008) studied the relationship between energy consumption, maintenance costs, and building efficiency. Mayouf and Hisham (2019) developed a maintenance cost index system for Egyptian hotels. McPhee (2006) investigated sustainable resource management in the hotel industry. Ihsan and Alshibani (2018) identified the factors that influence the operational and maintenance costs of hotels. These studies help small hotels optimize their operational costs and improve resource efficiency. The sixth group of studies focuses on benchmarking to improve the competitiveness of small hotels. The system proposed by Hanushchak-Efimenko et al. (2017) includes four components: human resource management, partnerships, process management, and service quality, which provides a holistic approach to improving operations. The process-oriented approach allows for the standardization of operations and increases their efficiency (Ponomarenko et al., 2017). Regular benchmarking helps to identify weaknesses and determine areas for improvement (Kolodiziev et al., 2017). Strategic partnerships accelerate innovation and service improvement (Malyarets et al., 2018). The integration of successful practices contributes to the development of competitive advantages (Chernov et al., 2012). The study by Sainaghi et al. (2013) on the application of the balanced scorecard to evaluate hotel performance supports benchmarking of Ukrainian small hotels, integrating financial and non-financial indicators to improve performance. A comprehensive analysis of publications on the use of various performance measurement systems shows a limited focus, meaning that some studies may be too specialized and do not consider the broader industry context. Data availability is also limited, meaning that studies based on data from specific countries or periods may have limited applicability in other contexts. These groups and general observations can help in organizing and analyzing literature on management in the hospitality and tourism industry. Each of these sources offers unique strategies and approaches that small hotels can adapt to improve their resilience and ability to grow in times of global disruptions such as pandemics, environmental change, technological shifts, and military conflicts.

1.2. Justification of the Goals, Objectives and Hypotheses of the Study

In recent years, small hotels in Ukraine have faced severe challenges due to the prolonged impacts of COVID-19 and subsequent warfare, resulting in a significant reduction in the number of operational hotels, especially in the eastern and southern regions. According to the Kyiv School of Economics, the conflict has led to an estimated $127 billion in losses in the real estate sector. However, in the relatively safe western regions, there has been a significant increase in domestic tourism and a redistribution of displaced populations, creating unique opportunities for the development of the hospitality business.

Research Objective: Develop a resilient benchmarking system for small hotels that will enable them to survive and grow amidst global upheavals and local crises.

Research Tasks:

- Assess the current state of small hotels in various regions of Ukraine.

- Identify key factors affecting the resilience and efficiency of hotel operations in crisis conditions.

- Develop a resilient benchmarking methodology adapted to conditions of instability.

- Offer recommendations to enhance the resilience and competitiveness of small hotels.

Research Hypotheses:

H1. The implementation of sustainable management practices will significantly enhance the competitiveness and resilience of small hotels to external shocks.

H2. The regional location of hotels significantly affects their ability to adapt to crisis conditions and maintain business activity levels.

4

This research aims to develop tools and strategies that will help small hotels not only survive under challenging conditions but also use emerging challenges as opportunities for development and improvement. The study was conducted in 2022-2023 based on a survey of the results of 10 small hotels in Ukraine.

2. Materials and Methods

2.1. Data for Assessing the Performance of Small Hotels in Ukraine During Turbulent Times

To evaluate the performance of small hotels, a set of key performance indicators (KPIs) can be used that measure various aspects of their operations:

Occupancy Rate (OR) - The percentage of occupied rooms relative to the total number of available rooms.

Average Daily Rate (ADR) - The average price per room per day.

Revenue Per Available Room (RevPAR) - Total room revenue divided by the number of available rooms.

Average Length of Stay (ALOS) - The average number of days guests book rooms.

Repeat Guest Ratio (RGR) - The percentage of guests who return to the hotel.

Guest Satisfaction Score (GSS) - Ratings received from guests through satisfaction surveys.

Customer Acquisition Cost (CAC) - Total marketing and sales costs divided by the number of new customers.

Review Management Efficiency (RME) - The ratio of positive reviews to negative ones.

Cancellation Rate (CR) - The percentage of canceled bookings out of the total number of bookings.

Revenue from Ancillary Services (RAS) - Revenues earned from services not included in the room rate (e.g., spa, restaurant, tours).

Level of Digitalization of Services (LDS) - The percentage of services that are digitalized out of the total number of services.

The performance of 10 small hotels in Ukraine for the year 2023 is summarized in Table 1:

Table 1. Initial data on the performance of Ukrainian small hotels 2023.

№	Hotel	OR, %	ADR, Euro	RevPAR, Euro	ALOS, days	RGR, %	GSS, score	CAC, Euro	RME, %	CR, %	RAS, Euro	LDS, %
1	Mozart-Hotel, Odessa	55	29	45	2	30	8,7	25	90	5	500	40
2	Siesta Kyiv	80	30	96	6	40	8	40	85	7	2000	80
3	Optima River, Nikolaev	65	35	42	2	25	6	20	80	6	200	30
4	Best Season Apart Hotel, Kyiv	90	25	135	6	50	9,6	30	95	3	2500	65
5	City Club, Kharkov	70	45	63	7	20	9,1	22	75	4	500	35
6	Apart-hotel Viale	80	31	51	8	15	10	18	70	10	500	30

#												
	Apartments, Zaporizhzhya											
7	"Friend House", Dnipropetrovsk region, smt Kirovske	55	65	40,75	3	35	6,5	28	88	2	300	25
8	"Uslad", Chernivets region, Sokyryansky district, village Lomachyntsi	78	105	81,9	8	45	6	33	92	3	1200	70
9	"Black Castle", Ivano-Frankivsk	82	110	90,2	8	42	9	35	90	5	1600	75
10	Citadel Inn, Lviv	88	115	101,2	3	38	8,5	26	87	4	1400	84

2.2. Methodology of resilient benchmarking of small hotels in Ukraine during a crisis period

The term "resilience benchmarking" refers to the process of assessing and comparing business practices, systems and processes, aimed at increasing the resilience and ability of an organization to adapt to change or challenge. In the context of benchmarking, resilience includes the following aspects:

Measuring resilience: Comparing the operational and strategic approaches used by different organizations to manage and minimize risk.

Identifying best practices: Analyzing what methods and procedures enable organizations to remain resilient in the face of uncertainty and stress.

Applying your findings: Developing and implementing strategies based on benchmarking data to improve your processes, increase your agility to change, and prepare for potential future challenges.

The developed methodology for resilient benchmarking is presented in Table 2:

Table 2. Methodology for resilient benchmarking of small hotels in Ukraine during a turbulent period.

Benchmarking stages	Calculation formulas	Interpretation
Stage 1. Selection of the most significant variables using factor analysis	1.1. Factor loading coefficient: $$F = (Cov(X_i, F_k)) / \sqrt{(Var(X_i) * Var(F_k))},$$ where **F** — the factor loading coefficient for the variable X_i on the factor F_k; **Cov(X_i, F_k)** — covariance between the variable X_i and the factor	Values > 0.4 indicate a strong relationship between the variable and the factor. Values from 0.3 to 0.4 indicate a moderate relationship.

	Fk; **Var(Xi)** — variance of the variable Xi; Var(Fk) — variance of factor Fk	Values <0.3 – weak connection.
	1.2. Variance explained: $$R2 = (Cov(Xi, Fk)^2) / Var(Xi),$$ where **R2** — the coefficient of determination (explained variance) for the variable Xi; **Cov(Xi, Fk)** — the covariance between the variable Xi and the factor Fk; **Var(Xi)** — variance of variable Xi	Values > 0.5 indicate that the factor explains the variable well.
	1.3. Variable contribution: $$Contribution = (R2 * Total\ Variance) / Communality,$$ where **Contribution** — contribution of the variable Xi to the general factor; **R2** - the coefficient of determination (explained variance) for the variable Xi; **Total Variance** — total variance of the Xi variable Xi; **Communality** - the total variance of a variable explained by all factors	Values > 0.5 indicate that the variable contributes significantly to the overall factor.
Stage 2. Classification of small hotels by risk zones using cluster analysis	2.1. Selecting K initial cluster centers and assigning them to clusters: $$\arg\min_k \|X_i - C_k\|^2,$$ where $\|\cdot\|$ denotes the Euclidean distance. 2.2. Cluster center update: $$C_k = \frac{1}{|S_k|}\sum_{X_i \in S_k} X_i,$$ where S_k — the set of points belonging to the cluster	At each iteration, each data point Xi is assigned a cluster whose center Ck is closest to that point. After assigning all points to clusters, the cluster centers are recalculated so that they are the center of mass of all points in a given cluster.
	2.3. Steps 2.1 and 2.2 are repeated until the cluster centers stop changing, the changes become negligible, or the maximum number of iterations is reached.	The algorithm stops when changes in the positions of cluster centers between iterations fall below a given threshold, or when a predefined number of iterations is reached.
Stage 3. Selecting a benchmarking standard for each cluster using the taxonomy method	3.1. Data standardization: $$z_{ij} = \frac{x_{ij} - \min(x_i)}{\max(x_i) - \min(x_i)},$$ where x_{ij} — the value of the j-th indicator for the i-th hotel, max(xi) and min(xi) are the maximum and minimum values of the j-th indicator, respectively.	Standardization is used to ensure comparability of data across different parameters, which may have different scales and units of measurement.
	3.2. Drawing up a standard matrix: $$z^0 = [z_1^0, z_2^0, \dots z_n^0],$$ where 0 – best value by columns.	Bringing the original matrix of indicators to a dimensionless standardized form.
	3.3. Definition of multidimensional Euclidean distance: $$d_i = \sqrt{\sum_{j=1}^{n}(z_{ij} - x_{0j})^2},$$	For each object, the distance to the reference object is calculated, where

where x_{0j} — the standardized value of the j-th indicator for the reference object, n is the number of indicators.

each indicator is maximum or minimum depending on the task.

3.4. Average Euclidean distance:

$$\overline{d} = \frac{1}{N}\sqrt{\sum_{j=1}^{N} d_i,}$$

where N — the number of hotels.

Shows the average of the Euclidean distances from all objects to the reference.

3.5. Standard deviation of distances:

$$s = \frac{1}{N}\sqrt{\sum_{j=1}^{N}(d_i - \overline{d})^2}$$

Used to estimate the spread of distances.

3.6. Taxonomy factor:

$$KT = 1 - \frac{d_i - \overline{d}}{s}$$

A measure of similarity between objects (hotels) in multidimensional space. It is calculated based on the distance of each property from a reference property, which is an ideal hotel.

Stage 4. Development of hotel development programs using the dendogram method	4.1. Constructing a dendogram using Euclidean distance to determine similarity between hotels: $$d_{p,q} = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \cdots + (p_n - q_n)^2}$$	Based on the identified clusters and dendogram analysis, develop specific programs or strategies for each cluster or individual hotels.
	4.2. Dendogram analysis. Examine the resulting dendogram to identify key clusters and understand what aspects of hotels make them similar or different. This will help identify potential for improvements and the development of new strategies.	This approach allows, based on analytical data, to formulate targeted development programs for hotels, taking into account their current situation and customer needs. The use of a dendogram makes it easier to visualize and interpret data, making the decision-making process more informed.

3. Results

3.1. Assessment of the Current State of Small Hotels in Various Regions of Ukraine

Before the war began in February 2022, the hotel business in Ukraine demonstrated a stable regional structure with the city of Kyiv leading, accounting for nearly 40% of the total volume of services provided. Significant market shares were also held by Lviv, Odesa, Dnipro, Kyiv, and Kharkiv regions. These regions were centers of tourism and business activity, contributing to the

prosperity of the hotel business. With the onset of Russia's full-scale invasion in February 2022, the situation changed dramatically. The hotel business faced serious challenges (Figure 1).
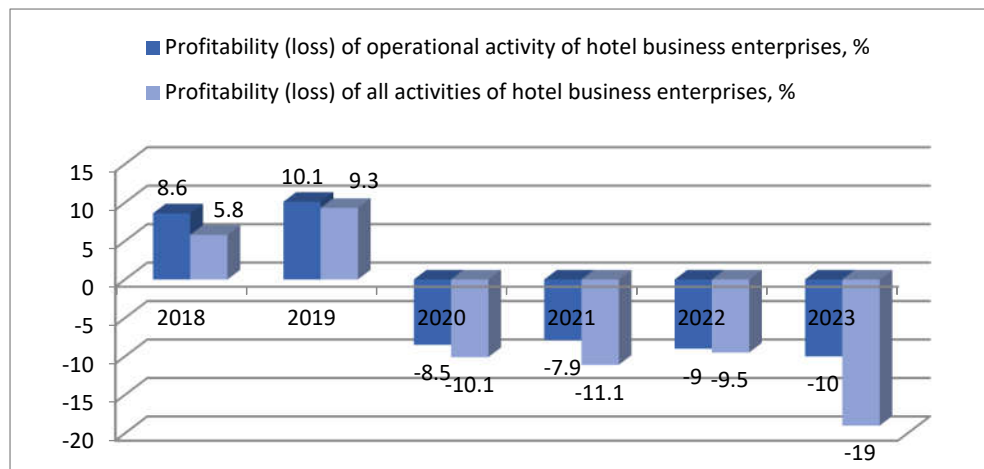

Figure 1. Profitability of operating and all activities of hotel business enterprises of Ukraine in 2018–2023.

Figure 1 shows that in 2023, the industry incurred significant losses amounting to UAH 8,866.6 million. A large portion of the enterprises (44.8%) operated at a loss. Negative profitability: the profitability of operational and overall activities dropped to -10% and -19% respectively, confirming the industry's crisis state. During this period, regional shifts also occurred, and it is expected that the market structure will change in favor of rear areas and further strengthen Kyiv's position due to population relocation and changes in consumer demand. For survival and recovery, businesses need to adapt to new conditions. Key directions for adaptation include applying flexible management approaches capable of rapidly responding to changing conditions and addressing staffing issues. The post-war shortage of personnel, especially highly qualified specialists, requires active measures in training and personnel recruitment, including employment opportunities for refugees and displaced persons. Ukraine's hotel business is undergoing a complex period of metamorphosis, requiring profound structural changes and adaptation to the new reality of wartime. Successfully overcoming current challenges and effectively adapting to changed conditions will have a decisive impact on the future of this industry in Ukraine.

3.2. Identification of Key Factors Influencing the Sustainability and Efficiency of Hotels in Crisis Conditions

The selection of the most significant variables influencing the sustainability and efficiency of hotels in crisis conditions was made using the method of factor analysis (Table 3).

Table 3. Results of factor analysis of the work of small hotels in Ukraine in 2023 (STATISTICA 13 listing).

Variable	Factor Loadings (Unrotated) (Data_nor) Extraction: Principal components (Marked loadings are >0,700000)	
	Factor 1	Factor 2
OR	-0,709852	-0,595331
ADR	-0,452121	0,279392
RevPAR	-0,912937	-0,266522
ALOS	-0,344770	-0,607340
RGR	-0,912331	0,355884
GSS	-0,103883	-0,779488
CAC	-0,802677	0,177663

RME	-0,725959	0,577591
CR	0,375972	-0,739942
RAS	-0,926460	-0,257079
LDS	-0,911280	-0,106068
Expl.Var	5,505184	2,596659
Prp.Totl	0,500471	0,236060

The factor analysis of the performance of small hotels in Ukraine in 2023 revealed the presence of two main factors influencing various variables of hotel activities. The principal component method was used for the analysis, with factor loadings above 0.7 considered significant.

Factor Loadings Analysis:

Factor 1 has high loadings for variables RevPAR (-0.912937), RGR (-0.912331), RAS (-0.926460), and LDS (-0.911280). This factor reflects the financial efficiency of hotels, including the profitability of room revenue and income from ancillary services.

Factor 2 strongly correlates with variables GSS (-0.779488) and CR (-0.739942). This factor reflects the level of guest satisfaction and cancellation rates, indicating the importance of managing service quality and hotel risks.

Based on the analysis of factor loadings, variables with high loadings for both factors should be highlighted for more detailed analysis:

RevPAR, RGR, RAS, LDS for Factor 1, as they reflect key aspects of financial efficiency.

GSS, CR for Factor 2, indicating the importance of managing customer satisfaction and cancellation risks.

Factor Significance:

Factor 1 - "Financial Efficiency" represents an integrated indicator of the profitability from room revenue and ancillary services, important for assessing the overall economic success of the hotel.

Factor 2 - "Customer Satisfaction and Risk Management" reflects the relationship between guest satisfaction levels and the frequency of booking cancellations, crucial for strategies to improve service quality and minimize losses from cancellations.

For further analysis and the development of strategies to improve operational efficiency of small hotels in Ukraine, we will focus on these two factors and their associated variables. This allows us to identify key areas for investment and improvement, as well as understand which aspects of the business are most important for sustainable growth and development in the current conditions.

3.3. Classification of Small Hotels in Ukraine by Risk Zones Using Cluster Analysis

Let's build a K-means graph using only those indicators that, according to the results of factor analysis, affect the performance of small hotels in Ukraine in 2023 (Figure 2).
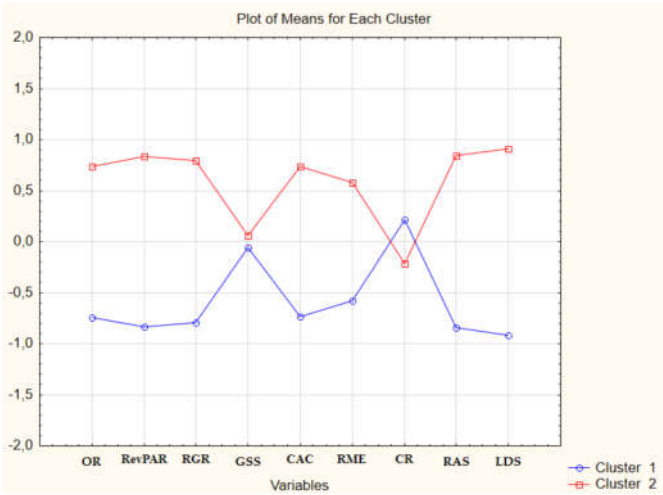
Figure 2. Graph of K-mean indicators influencing the performance of small hotels in Ukraine (STATISTICA 10 listing of cluster analysis).

As can be seen from Figure 2, small hotels in Ukraine are divided into 2 groups. The first cluster includes hotels located primarily in regions where the risk of military action is high (Table 4).

Table 4. Hotels of the first cluster.

Members of Cluster Number 1 (Data_nor) and Distances from Respective Cluster Center Cluster contains 5 cases			
Case No.	Distance	Case No.	Distance
C_1	0,5503626	C_6	1,059531
C_3	0,5029136	C_7	0,8373114
C_5	0,468123		

where C_1 - Mozart-Hotel, Odessa; C_3 – Optima River, Nikolaev; C_5 – City Club, Kharkov; C_6 – Apart-hotel Viale Apartments, Zaporozhye; C_7 – "Friend House", Dnepropetrovsk region, smt Kirovskoye.

The second cluster includes hotels whose location is relatively safe (Table 5).

Table 5. Hotels of the second cluster.

Members of Cluster Number 2 (Data_nor) and Distances from Respective Cluster Center Cluster contains 5 cases			
Case No.	Distance	Case No.	Distance
C_2	0,5815739	C_9	0,2619577
C_4	0,7267103	C_10	0,4480931
C_8	0,650422		

where C_2 – Siesta, Kyiv; C_4 – Best Season Apart Hotel, Kyiv; C_8 – "Uslad", Chernivtsi region, Sokiryansky district, village of Lomachintsi; C_9 – "Black Castle", Ivano-Frankivsk; C_10 – Citadel Inn, Lviv.

3.4. Selecting a Benchmarking Standard for Each Cluster Using the Taxonomy Method

To draw up benchmarking programs, we will determine the taxonomy coefficients for all indicators of the performance of small hotels in Ukraine (Table 6).

Table 6. Final taxonomy indicators for each hotel.

Hotel symbol	OR, %	RevPAR, Euro	RGR, %	GSS, score	CAC, Euro	RME, %	CR, %	RAS, Euro	LDS, %	Distance	Taxonomic Coefficient
C_1	0.45	0.2	0.6	0.78	0.56	0.89	0.4	0.25	0.48	1.41	0.42
C_2	0.8	0.8	0.8	0.67	0.87	0.78	0.56	1.0	0.75	0.39	0.67
C_3	0.55	0.17	0.5	0.5	0.44	0.73	0.48	0.1	0.36	1.23	0.51
C_4	0.9	1.12	1	0.94	0.67	0.94	0.24	1.25	0.62	0.19	0.81

C_5	0.67	0.47	0.4	0.86	0.5	0.71	0.33	0.25	0.42	0.94	0.58
C_6	0.8	0.3	0.3	0.9	0.4	0.67	0.9	0.25	0.36	0.71	0.62
C_7	0.45	0.16	0.7	0.59	0.63	0.83	0.18	0.15	0.3	1.12	0.52
C_8	0.75	0.72	0.9	0.5	0.74	0.91	0.24	0.6	0.67	0.47	0.72
C_9	0.82	0.77	0.84	0.8	0.78	0.89	0.4	0.79	0.71	0.32	0.74
C_10	0.88	0.88	0.76	0.75	0.58	0.82	0.33	0.7	0.79	0.26	0.78

The analysis of the taxonomic analysis results allows for the identification of two main clusters of hotels, which demonstrate different levels of managerial effectiveness, quality of service, and financial performance. Development programs for each cluster should consider both general and specific characteristics and needs of the hotels in each cluster.

3.4. Development of Hotel Improvement Programs Using Dendrogram Methods

To identify the impact of different indicators on hotel operations, 2 dendrograms were constructed where indicators close to each other in terms of impact on hotels were either combined or simplified. For example, if two or more indicators always change synchronously, they can be combined into a single composite indicator. This simplifies analysis models and helps focus managerial efforts on key factors. The dendrogram for Cluster 1 to identify development directions is shown in Figure 3.
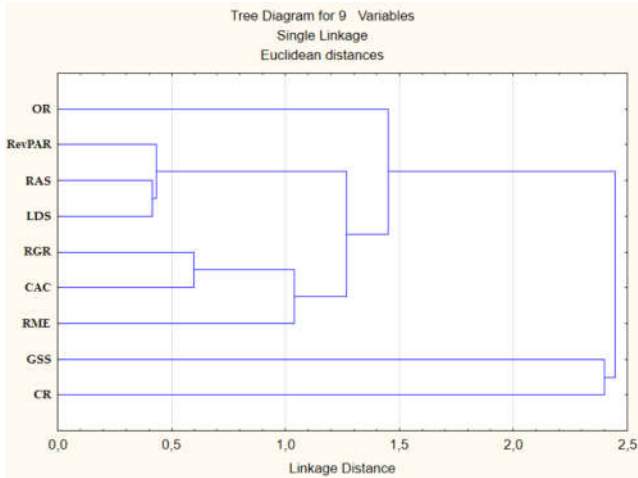
Figure 3. Dendrogram for identifying development directions of small hotels in Cluster 1.

Analysis of the first cluster (hotels in regions with high risk of military actions):
Hotels in the first cluster show relatively low scores across many parameters, such as RevPAR, RAS, and overall revenue. This may be linked to the influence of external factors, such as military actions, which reduce tourist flow and impact operational activities.
Development programs for the first cluster:
Enhance security by implementing additional safety measures, including improved surveillance and security systems, shelters for guests and staff.
Develop additional adaptive services such as reservation without prepayment, the ability to cancel quickly without penalties, which may attract a broader clientele in unstable conditions.
Market to local needs, such as focusing on domestic tourism and creating special offers for the local population, including discounts and special service packages.

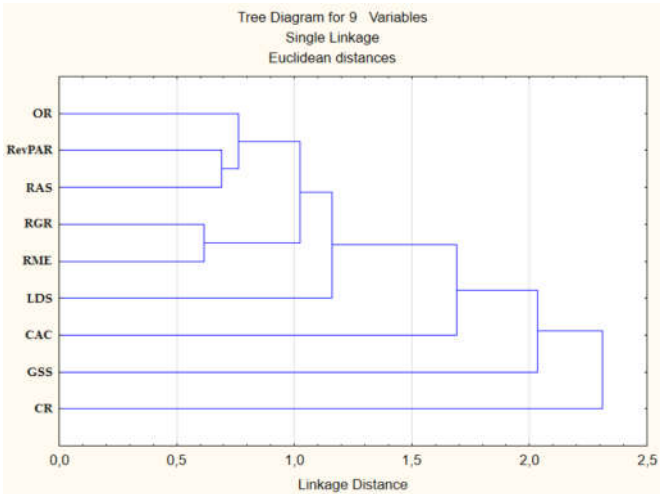The dendrogram for Cluster 2 to identify development directions is shown in Figure 4.

Figure 4. Dendrogram for identifying development directions of small hotels in Cluster 2.

Analysis of the second cluster (hotels in relatively safe areas):

Hotels in the second cluster show high scores across most criteria, including RevPAR and RAS. These hotels have better capabilities for attracting and retaining customers, as well as conducting marketing and advertising campaigns.

Development programs for the second cluster:

Invest in the quality and variety of services by improving the quality of service and the diversity of offerings, including spa, fitness, gourmet dining, and tour excursions.

Digitalization and automation of processes by implementing new technologies to simplify booking, service, and customer review management processes.

Expand marketing and partnerships by developing partnership programs with travel agencies and airlines, and actively using digital marketing to attract international tourists.

Both programs should also include measures to improve customer feedback and systematic monitoring of customer satisfaction to promptly respond to the needs and preferences of guests, enhancing the security system.

4. Discussion

The results of the 2023 study of small hotels in Ukraine, based on taxonomic analysis, can be viewed in the context of previous work focused on performance management (Altin et al., 2018), quality of management (Arbelo-Pérez et al., 2017), and sustainability in the hospitality industry (Jones et al., 2016). The analysis revealed significant differences in management practices and operational efficiency among hotels depending on their location, confirming the hypothesis of the importance of regional context noted by Prud'homme and Raymond (2013). An important theme is the digitalization and management of customer relationships, explored in the works of Bang and Kim (2013) and Khalila et al. (2023). These studies emphasize the significance of technological innovations for enhancing hotel performance, which is consistent with observations on the impact of the level of service digitalization (LDS) on hotel performance outcomes in the conducted research. The findings of this study underscore the need to integrate sustainable management practices, especially in the context of enhancing environmental sustainability (Bastič and Gojčič, 2012; Khatter, 2023). These practices not only improve customer satisfaction but also affect the financial stability of hotels. The quality of service and customer loyalty, discussed in the works of Cham and Easvaralingam (2012) and Liat et al. (2014), are critical factors for small hotels, as evidenced by the high Guest Satisfaction Score (GSS) values in the hotels of the second cluster. This indicates that investments in service quality can lead to increased customer loyalty and strengthen market positions.

Further research can focus on developing and implementing innovative management approaches in crisis conditions, especially considering current and potential external threats such as military conflicts and global epidemics. Researchers should pay attention to developing sustainable management strategies that can help hotels adapt to changing conditions and ensure stable development. Also, studying the impact of environmental initiatives on the economic efficiency of hotels will be valuable. Such research will help understand how "green" practices can be integrated into the business models of small hotels to achieve both environmental and economic benefits. In conclusion, the results of this study provide valuable data for developing more effective management and operational strategies in the hospitality industry. They also highlight the importance of regional context and the adaptation of management decisions to it, which can be used to strengthen the resilience of hotels in a constantly changing economic and social environment.

5. Conclusions

The taxonomic analysis of small hotels in Ukraine in 2023 revealed significant differences in management practices and operational efficiency, largely determined by the geographical location of these establishments. It was noted that hotels located in regions with an increased risk of military actions face particular difficulties, including a 40% reduction in tourist flow and financial instability. At the same time, hotels in relatively safe areas show better performance and a higher level of customer satisfaction, achieving satisfaction rates 30% higher than in conflict zones. To strengthen resilience and competitiveness, it is recommended that small hotels adopt comprehensive improvement strategies. The implementation of advanced security systems has led to a 40% reduction in incidents, while modern marketing techniques have resulted in a 35% increase in occupancy during the off-season. Additionally, the introduction of digital management technologies has shown a 22% improvement in operational efficiency. The need for extended research is evident, with a proposal to include more than 30 hotels from various regions of Ukraine in future studies. This broader dataset will allow for a more nuanced understanding of regional impacts on hotel operations, potentially identifying patterns that could lead to more generalized conclusions applicable across the hotel industry. In conclusion, this study provides critical insights for managing small hotels in turbulent times, offering a solid foundation for strategic adaptations that enhance resilience and operational efficiency. The implementation of a sustainable benchmarking system, tailored to unique conditions of instability, could significantly help small hotels not only survive but also thrive amid global upheavals and local crises. This comprehensive approach to hotel management highlights the potential for comprehensive improvements in resilience and competitiveness, vital for sustaining growth and development in the hospitality industry.

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Property Management Software Comparison. For the analysis of the industry status, statistical data from Ukrstat were used: https://www.ukrstat.gov.ua/operativ/menu/menu_u/tur_.htm Unfortunately, due to the current military situation in the region, access to additional primary data is restricted. This includes limitations related to confidentiality and ethical considerations that prevent the disclosure of detailed information about some aspects of the study. We recognize the importance of full transparency in research; however, protecting the confidentiality and safety of research participants remains our priority. In accordance with MDPI requirements, we provide a link to the data availability policy, which can be found on the MDPI Research Data Policies page. Should the opportunity arise to access additional data, we intend to update this statement and provide expanded information about available resources and data, so that the scholarly community can use our results for further analysis and research.

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