

EVALUATING HEALTH TOURISM SERVICES IN BOSNIA AND HERZEGOVINA

Anđelka Štilić¹, Allen Popović Beganović², Adis Puška³

Abstract

Bosnia and Herzegovina (BiH) possesses abundant resources that offer favorable opportunities for the development of health tourism. However, these resources are currently underutilized, with the majority of health tourism services being provided through thermal spa centers. Hence, the objective of this research was to analyze user satisfaction with six thermal spa centers located in Bosnia and Herzegovina. User ratings on the Booking.com platform were employed as a measure of satisfaction. These centers utilize Booking.com as a global promotion and booking tool, allowing users worldwide to access their services. To determine the highest-rated thermal spa centers, multi-criteria decision-making (MCDM) methods were applied. Specifically, the Entropy method was used to assign weights to different criteria, while the CRADIS (Compromise Ranking of Alternatives from Distance to Ideal Solution) method facilitated the ranking of terms based on their ratings. The analysis revealed that Terme Ozren and Terme Laktaši achieved the highest user satisfaction ratings. These findings emphasize the importance of continuous improvement of user satisfaction for all facilities offering tourist services, including thermal spa centers. User ratings on the Booking.com platform can serve as valuable guidance and feedback to enhance the quality of services.

Key words: Thermal spa centers, Bosnia and Herzegovina, Booking, Entropy, CRADIS method.

Introduction

In the pursuit of balance and rejuvenation, individuals are increasingly drawn to health and wellness tourism as a means of escaping the pressures of daily life and nurturing their well-being (Lee et al., 2020; Rahmani et al., 2023; Smith, 2021). Among the destinations that have gained recognition for their natural beauty and healing thermal waters, Bosnia and Herzegovina (BiH) is distinguished as a captivating country for spa enthusiasts. With its diverse range of spa resorts, BiH

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offers a unique opportunity to experience the transformative power of wellness (Beganović et al., 2021).

This paper aims to address the growing demand for a comprehensive evaluation system that guides individuals in selecting the best spa centres in BiH. The objective is to provide visitors with insights into the diverse offerings available, enabling them to make informed choices when embarking on a health or wellness journey. By evaluating termal spa centres in BiH, this study aims to highlight exceptional establishments that excel in providing a truly immersive experience. The selection of criteria ensures a comprehensive assessment that encompasses not only the quality of the spa treatments but also the overall experience and guest satisfaction. These considerations encompass factors that contribute to an environment of trust, comfort, and a profound sense of well-being, while also ensuring access to a wide range of health and wellness amenities and services. By incorporating elements that enhance guest satisfaction and contribute to the overall experience, this evaluation system aims to assist individuals in selecting termal spa centres that align with their preferences and needs (Sheng et al., 2022).

This evaluation process benefits not only potential visitors seeking the ultimate relaxation getaway but also serves as a valuable resource for spa operators. By identifying areas of strength and areas for improvement, the services provided by operators can be continually enhanced, ensuring a world-class experience for guests. This focus on quality and continuous improvement promotes healthy competition among termal spa centres in BiH, ultimately raising the standards of the health and wellness tourism industry in the region (Álvarez-García et al., 2019).

While this paper primarily focuses on the evaluation of termal spa centres, it is important to recognize the broader significance of health and wellness tourism. Beyond the pursuit of relaxation and rejuvenation, health and wellness tourism contributes to local economies, promotes sustainable practices, and fosters a deeper connection with nature and oneself (Derrien et al., 2019; Winter et al., 2019). By identifying and promoting the best termal spa centres in BiH, support is provided for the growth of health and wellness tourism in the region, creating opportunities for both personal well-being and economic development (Štilić et al., 2021).

The subsequent sections of this paper will delve into the specific evaluation methodology, present the results, and discuss the implications for both visitors and spa operators.

Literature review

The concept of health and wellness tourism has gained significant attention in recent years as individuals seek unique experiences that promote their physical, mental, and spiritual well-being (Dillette et al., 2021; Sthapit et al., 2022; Saltik & Akova, 2022). Within this context, spa resorts have emerged as prominent destinations for wellness seekers, offering a combination of therapeutic treatments, serene environments, and holistic experiences (Kim & Yang, 2023;

Majeed & Ramkissoon, 2020). This section presents a literature review that explores the key themes surrounding spas, health and wellness tourism, and the ranking of spa resorts, with a specific focus on the context of BiH.

Spas have a long history dating back to ancient civilizations, where natural thermal springs were revered for their healing properties (Agnew, 2019; Erfurt, 2021a, 2021b). Today, spa resorts continue to serve as retreats where individuals can escape the demands of modern life and immerse themselves in rejuvenating experiences. Scholars have highlighted the multifaceted benefits of spa visits, including stress reduction (Isidor & Kren, 2022; Nishikawa, 2019), improved physical health (Huang et al., 2019; Patterson & Balderas-Cejudo, 2022), enhanced mental well-being (Martins & Morales, 2021; Olson & Ro, 2021), and increased social connections (Koskinen, 2019; Mai & Nguyen, 2023). Moreover, spas play a vital role in wellness tourism, attracting travelers who prioritize self-care and seek destinations that offer transformative experiences (Wright & Zascerinska, 2022).

Health and wellness tourism, as a rapidly growing sector of the travel industry, encompasses various activities and experiences that promote personal well-being. It encompasses not only spa visits but also other wellness-oriented practices such as yoga retreats, meditation centers, and fitness resorts (Jha, 2021). The demand for this kind of tourism experiences has been fueled by increasing awareness of the importance of self-care, stress management, and overall well-being in contemporary society. BiH, with its rich natural resources and thermal springs, has emerged as a promising destination for health and wellness tourism, offering a unique blend of cultural heritage and natural beauty (Mijajlovic et al., 2020).

To facilitate decision-making for health and wellness tourists, the evaluation of spa centres has become vital. A variety of approaches and frameworks have been proposed to assess the quality and performance of spa facilities. One such approach is the use of objective criteria, such as facility infrastructure, range of treatments, and qualifications of staff (Becková & Kantorová, 2021; Pedro & Pereira, 2021; Rodrigues et al., 2021) to provide a standardized assessment. Additionally, subjective criteria, including customer satisfaction, service quality, and guest reviews, have been employed to capture the holistic experience and perception of guests (Katsoni, 2023; Khathi, 2021; Sangpikul, 2021). The integration of objective and subjective criteria enables a comprehensive evaluation that reflects both the tangible aspects of spa facilities and the intangible elements of guest experiences.

While several studies have examined spa centres and their ranking in different geographical contexts (Marčeková & Grausová, 2023; Riswanto & Kim, 2023; Soares & Rodríguez-López, 2022; Wisitnorapatt & Sirirat, 2023), the research specific to BiH remains limited. Given the unique characteristics of BiH, such as its thermal springs and cultural heritage, there is a need to explore and evaluate the spa centres in this region. By providing a comprehensive overview of the best spa resorts in BiH, this study aims to contribute to the growing body of knowledge on health and wellness tourism and support both tourists in their decision-making process and spa operators in enhancing their offerings.

Methodology

BiH possesses numerous thermal springs that are utilized for therapeutic purposes. This study aimed to identify the thermal spa center with the highest ratings on booking platforms through a multi-criteria decision-making (MCDM) approach. The research methodology consisted of the following phases:

- Phase 1: Identification of criteria and thermal spa centers in BiH.
- Phase 2: Construction of the initial decision-making matrix.
- Phase 3: Determination of the criteria weights using the Entropy method.
- Phase 4: Ranking of thermal spa centers using the CRADIS method.
- Phase 5: Conducting a sensitivity analysis.

During Phase 1, the research utilized the services of Booking.com, a renowned digital travel company specializing in accommodation bookings. Booking.com serves as a platform that connects providers of travel offers with tourists, offering a vast selection of 28 million accommodation units. By searching the listings on Booking.com, six spas in Bosnia and Herzegovina were identified as the alternatives for this research: Terme Laktaši, Terme Ozren, Spa Hotel Terme, Hotel Hills Thermal Spa Resort, Hotel Kardial, and Banja Kulaši. These accommodation units have been rated by users, and the ratings are available on the Booking.com platform for criteria such as Staff, Facilities, Cleanliness, Comfort, Value for Money, and Location.

The subsequent phase involves the formation of the initial decision-making matrix. This matrix is created by evaluating the alternatives based on predetermined criteria. In this case, the thermal spa centers were rated by users on Booking.com, and these ratings were utilized to construct the initial decision-making matrix. This matrix serves as the fundamental basis for implementing the MCDM methodologies.

Once the initial decision-making matrix is established, the next step involves calculating the weights of the criteria. To accomplish this, the Entropy method, renowned for its objectivity in determining criteria weights, will be employed. The following steps outline the implementation of this method.

Step 1. Establishing the initial decision matrix, as part of Phase 2 of the research.

Table 1. Initial decision matrix

	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
Terme Laktaši	8.4	7.9	8.5	8.3	8.2	8.7
Terme Ozren	9.1	8.8	9.0	9.2	8.4	8.1
Spa Hotel Terme	8.0	7.5	7.7	8.0	7.6	8.5
Hotel Hills Thermal Spa Resort	8.7	8.8	8.8	8.9	8.4	8.6
Hotel Kardial	8.7	8.4	8.8	8.8	8.2	8.8
Banja Kulaši	8.9	8.6	9.1	8.6	8.7	8.6

Step 2. Normalization of the initial decision matrix, which represents the initial step in the calculation process of each MCDM method (Puška and Stojanović, 2022). This step involves applying normalization based on the following expressions:

$$n_{ij} = \frac{x_{ij}}{x_{j \max}}, \text{ for benefit criteria;} \quad (1)$$

$$n_{ij} = \frac{x_{j \min}}{x_{ij}}, \text{ for cost criteria.} \quad (2)$$

It is important to highlight that the grade values should aim to be as high as possible, thus Expression 1 is applied for all criteria..

Step 3. Determining the Entropy Value (E_i). In this step, the value of the natural logarithm (\ln) multiplied by the corresponding data value from the normalized matrix is calculated. Subsequently, this obtained value is divided by the natural logarithm of the number of alternatives ($\ln(n)$).

$$E_i = \frac{\sum_{j=1}^n p_{ij} \cdot \ln p_{ij}}{\ln n} \quad (3)$$

Step 4. Determining the weight of the criteria. The final weight of each criterion is calculated using the following expression:

$$w_i = \frac{1-E_i}{\sum_{i=1}^m (1-E_i)} \quad (4)$$

By following these steps, the weights of the criteria are determined, and the subsequent phase of the research can be carried out.

Once the initial decision-making matrix has been established, the thermal spa centers need to be ranked based on the user ratings. This ranking will be conducted using the CRADIS method, which consists of the following steps::

Step 1. Establishing the initial decision matrix.

Step 2. Normalization of the initial decision matrix, with note that the CRADIS method employs the same normalization procedure as the Entropy method.

Step 3. Weighting of the decision matrix. In this step, the normalized decision matrix is multiplied by the respective weights.

$$v_{ij} = n_{ij} \times w_j \quad (5)$$

Step 4. Determination of the ideal and anti-ideal values. The ideal value corresponds to the highest value in the decision matrix (v_{ij}), while the anti-ideal value represents the lowest value in this matrix (v_{ij}).

$$t_i = \max \tilde{v}_{ij} \quad (6)$$

$$t_{ai} = \min \tilde{v}_{ij} \quad (7)$$

Step 5. Calculation of deviations from the ideal and anti-ideal values.

$$d^+ = t_i - \tilde{v}_{ij} \quad (8)$$

$$d^- = \tilde{v}_{ij} - t_{ai} \quad (9)$$

Step 6. Determination of the ideal (A_{ia}) and anti-ideal (A_{aia}) optimal alternatives based on the deviations from the ideal and anti-ideal values.

Step 7. Calculation of the sum of deviations for each individual alternative.

$$s_i^+ = \sum_{j=1}^n d^+ \quad (10)$$

$$s_i^- = \sum_{j=1}^n d^- \quad (11)$$

Step 8. Calculation of the utility function for each alternative, considering the deviations from the optimal alternatives.

$$K_i^+ = \frac{s_0^+}{s_i^+} \quad (12)$$

$$K_i^- = \frac{s_i^-}{s_0^-} \quad (13)$$

Step 9. Determination of the value of the CRADIS method.

$$Q_i = \frac{K_i^+ + K_i^-}{2} \quad (14)$$

By following these steps, the ranking of the observed thermal spa centers in BiH is calculated.

The final stage of this research involves conducting a sensitivity analysis. The purpose of this analysis is to evaluate the impact of individual criterion weights on the ranking of the alternatives. To assess this influence, the weights of each criterion will be progressively reduced by 15% until reaching 10% of their initial value (Mešić et al., 2022). This procedure will be performed for all six criteria, resulting in a total of 36 scenarios for this analysis.

Results

In accordance with the methodology described, the first step is to determine the weights of the criteria using the Entropy method. Initially, the initial decision-making matrix (Table 1) is established, which is then normalized using expression 1, resulting in the formation of a normalized decision-making matrix (Table 2).

Table 2. Normalized decision matrix

	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
Terme Laktaši	0.923	0.898	0.934	0.902	0.943	0.989
Terme Ozren	1.000	1.000	0.989	1.000	0.966	0.920
Spa Hotel Terme	0.879	0.852	0.846	0.870	0.874	0.966
Hotel Hills Thermal Spa Resort	0.956	1.000	0.967	0.967	0.966	0.977
Hotel Kardial	0.956	0.955	0.967	0.957	0.943	1.000
Banja Kulaši	0.978	0.977	1.000	0.935	1.000	0.977

The entropy value (E_i) (Expression 3) is calculated based on the normalized decision matrix, and subsequently, the final weights of the criteria are derived (Expression 4). According to the results obtained from the Entropy method, the highest weight is assigned to the Comfort criterion ($w = 0,1723$), followed by Facilities ($w = 0,1681$), while the Location criterion receives the lowest weight ($w = 0,1574$).

Table 3. Calculating the weight of criteria using the Entropy method

	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
E_i	-0.165	-0.167	-0.157	-0.196	-0.166	-0.093
	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
$1-E_i$	1.165	1.167	1.157	1.196	1.166	1.093
	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
w_j	0.1677	0.1681	0.1666	0.1723	0.1679	0.1574

Once the criteria weights are determined, the observed thermal spa centers are ranked using the CRADIS method. The first two steps of this method are identical to those of the Entropy method. Subsequently, the weighted decision matrix (Expression 5) is calculated (Table 4). Based on the data values of the weighted decision matrix (Table 4), the ideal ($t_i = 0,1723$) and anti-ideal ($t_{ai} = 0,1410$) values are computed, and the deviations of the weighted decision matrix values from these values are determined. The ideal and anti-ideal optimal alternatives (A_{aia}) are then formed, and the sum of deviations for each alternative is calculated (Expression 10 and 11).

Table 4. Weighted decision matrix

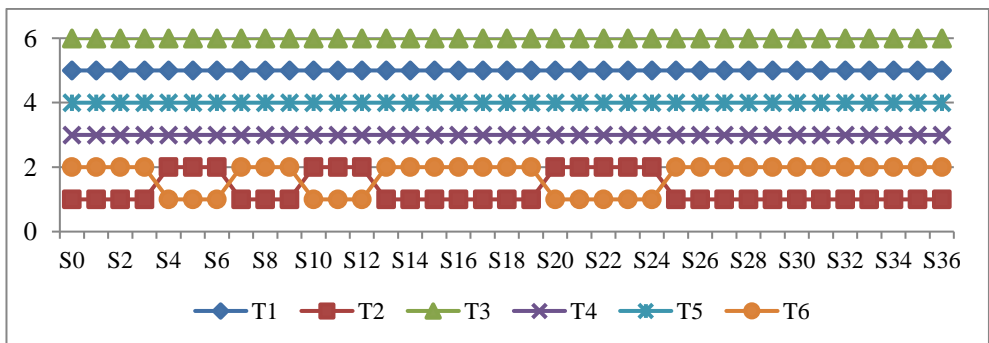
	Staff	Facilities	Cleanliness	Comfort	Value for money	Location
Terme Laktaši	0.1548	0.1509	0.1556	0.1555	0.1583	0.1556
Terme Ozren	0.1677	0.1681	0.1648	0.1723	0.1621	0.1448
Spa Hotel Terme	0.1474	0.1433	0.1410	0.1498	0.1467	0.1520
Hotel Hills						
Thermal Spa Resort	0.1603	0.1681	0.1611	0.1667	0.1621	0.1538
Hotel Kardial	0.1603	0.1605	0.1611	0.1648	0.1583	0.1574
Banja Kulaši	0.1640	0.1643	0.1666	0.1611	0.1679	0.1538

Subsequently, the utility function is computed (Expression 12 and 13), and the final value of the CRADIS method is obtained (Expression 14). The highest-ranked alternative is the Thermal spa center Terme Ozren, which attains the highest CRADIS value, followed by Terme Laktaši. Conversely, Spa Hotel Terme ranks the lowest based on user ratings on booking.com.

Table 5. Calculation of the ranking order using the CRADIS method

Id	Thermal spa centres	s^+	s^-	K_i^+	K_i^-	Q_i	RANK
T1	Terme Laktaši	0.1032	0.0849	0.3279	0.5503	0.4391	5
T2	Terme Ozren	0.0540	0.1341	0.6270	0.8695	0.7482	1
T3	Spa Hotel Terme	0.1537	0.0345	0.2203	0.2234	0.2218	6
T4	Hotel Hills Thermal Spa Resort	0.0617	0.1264	0.5486	0.8195	0.6840	3
T5	Hotel Kardial	0.0715	0.1166	0.4734	0.7560	0.6147	4
T6	Banja Kulaši	0.0562	0.1319	0.6026	0.8553	0.7290	2
	S_0	0.0338	0.1543				

To evaluate the influence of the weights on this ranking, a sensitivity analysis is conducted. By reducing the weights of individual criteria, 36 scenarios are generated (Figure 1). The results reveal changes in the ranking primarily for the top two thermal spa centers. These variations occur when there are alterations in the weights of the Personnel, Facilities, and Comfort criteria.

Figure 1. Results of the sensitivity analysis

This can be attributed to the fact that Terme Ozren receives better ratings for these criteria compared to Terme Laktaši. Consequently, with the reduction of weights assigned to these criteria, the ranking of the two thermal spa centers is altered. The rankings of the remaining thermal spa centers remain unchanged. Based on these findings, it can be concluded that Terme Ozren and Terme Laktaši demonstrate the most favorable indicators according to user assessments.

Discussion

Health and wellness tourism has undergone changes to accommodate a diverse range of service users. Initially, spas and thermal baths primarily catered to individuals seeking treatment for health issues. However, the current landscape depicts a shift, with spas now attracting tourists from various categories (Pjerotić et al., 2016). These individuals visit spas and thermal baths to unwind and avail themselves of specific treatments. These establishments increasingly offer diverse services that encompass alternative therapies focused on cosmetic enhancements, aesthetics, fitness, and more (Adongo et al., 2017). The overarching goal is to help tourists relax, improve their appearance, and prolong their lifespan (Hall, 2011). This evolution is driven by people's heightened focus on personal health and the desire to extend their longevity. Consequently, the services provided by spas and thermal baths represent a significant component of medical tourism.

In order to entice tourists to visit these facilities, ensuring customer satisfaction is paramount (Rozalia Gabor et al., 2023). To evaluate this aspect, the present research incorporates user evaluations of their satisfaction with spa and thermal bath services. Users express their ratings on booking platforms after experiencing these facilities. The research aims to rank spas and thermal baths based on these ratings, employing a methodology rooted in multi-criteria analysis methods. Two methods, namely Entropy and CRADIS, were utilized. The entropy method was employed to determine the weights of the evaluation criteria used for these establishments. This method falls within the category of objective methods for determining criteria weights. It assigns weights based on the value of alternatives for each criterion (Stojanović et al., 2022). Criteria exhibiting greater value dispersion hold higher weightage. This study assigns the greatest weight to the Comfort criterion, which displays significant rating variance. However, the weights assigned to other criteria do not significantly deviate from one another. Hence, it can be inferred that these criteria have an equal impact on the final ranking of thermal spa centers.

The CRADIS method was utilized to rank the observed establishments. This method ranks alternatives based on their deviation from ideal and anti-ideal values (Puška et al., 2022). The optimal alternatives should closely approach the ideal values while maintaining a considerable distance from the anti-ideal values to yield the best possible results. The findings reveal that the Terme Ozren facility obtains the highest ranking, followed by the Terme Laktaši facility. These two establishments stand out from the rest. Therefore, it can be concluded that users rate these facilities the highest and are most satisfied with their services.

However, the ratings of other facilities are also commendable, with all exceeding a rating of 7.5, indicating high user satisfaction. The sensitivity analysis demonstrates that, even with a reduction in the importance of certain criteria, these two facilities consistently perform well.

The findings of this research can aid other establishments in enhancing user satisfaction and obtaining better ratings. This will enhance their competitiveness in the market. Additionally, all these facilities should leverage the advantages that BiH offers in terms of health and wellness tourism. The country possesses abundant natural resources that can be harnessed for the development of this tourism segment. Consequently, it is crucial to strengthen the health and wellness tourism offerings in Bosnia and Herzegovina by establishing new facilities and bolstering the competitiveness of existing ones. Simultaneously, user ratings on booking platforms serve as indicators of customer satisfaction levels.

Conclusion

This research focuses on analyzing the satisfaction levels of users in the health and wellness tourism sector in Bosnia and Herzegovina (BiH). The study utilizes user ratings from the Booking.com platform, specifically targeting six segments of health tourism services. Six facilities that utilize the Booking.com platform to attract users were included in the research. Thus, the study examines six criteria across these six establishments, employing multi-criteria analysis methods. The Entropy and CRADIS methods were applied in this research. The Entropy method was used to determine the weights assigned to each criterion. Interestingly, the Comfort criterion received the highest rating among all the observed criteria. The CRADIS method was then employed to rank the health and wellness tourism facilities. Terme Ozren and Terme Laktaši emerged as the top-ranking establishments, showcasing the most favorable results. These findings were further validated through a conducted sensitivity analysis. The research outcomes provide valuable insights for enhancing health tourism services in BiH. The study underscores the significance of prioritizing user satisfaction and emphasizes the need for both the observed facilities and other industry players to improve their services accordingly. By focusing on enhancing service quality and meeting user expectations, the health tourism sector in Bosnia and Herzegovina has the potential for further development and growth.

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OCJENA USLUGA ZDRAVSTVENOG TURIZMA U BOSNI I HERCEGOVINI

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Apstrakt

Bosna i Hercegovina (BiH) raspolaže obiljem resursa koji pružaju povoljne mogućnosti za razvoj zdravstvenog turizma. Međutim, ovi resursi trenutno su samo djelomično iskorišćeni, s najvećim dijelom usluga zdravstvenog turizma koji se pruža putem banja i termi. Stoga je cilj ovog istraživanja bio analizirati zadovoljstvo korisnika u vezi sa šest termi koje se nalaze u BiH. Da bi se postigao taj cilj, ocjene korisnika na platformi Booking.com korištene su kao mjerilo zadovoljstva. Spomenute terme koriste Booking.com kao sredstvo za globalno promoviranje i rezervaciju svojih usluga, omogućavajući korisnicima širom svijeta da pristupe njihovim ponudama. Kako bi se utvrdilo koje termalne spa centre korisnici najbolje ocjenjuju, primijenjene su metode višekriterijskog odlučivanja. Konkretno, korištena je metoda Entropije za određivanje težina različitih kriterija, dok je metoda CRADIS (Compromise Ranking of Alternatives from Distance to Ideal Solution) omogućila rangiranje termi na temelju njihovih ocjena. Analiza je pokazala da su objekti Terme Ozren i Terme Laktaši postigli najbolje rezultate, prema zadovoljstvu korisnika. Ovi nalazi upućuju na važnost kontinuiranog unapređenja zadovoljstva korisnika za sve objekte koji pružaju turističke usluge, uključujući one iz područja zdravstvenog turizma. U tu svrhu, ocjene koje sami korisnici daju na platformi Booking.com mogu pružiti korisne smjernice i povratne informacije za poboljšanje kvalitete usluga.

Ključne riječi: Terme, spa centri, Bosna i Hercegovina, buking, Entropy, CRADIS metod.

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