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Procjena brenda grada Trebinja kroz prizmu vještačke inteligencije

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Apstrakt: U savremenom digitalnom okruženju, brendiranje gradova prevazilazi tradicionalne pristupe i sve više uključuje savremene tehnologije, posebno vještačku inteligenciju (AI). Ovaj rad analizira brend grada Trebinja kroz prizmu place branding-a, uz korišćenje ChatGPT modela kao alata za obradu i interpretaciju sekundarnih podataka. Fokus je stavljen na šest ključnih dimenzija Brenda grada: percepciju, atraktivnost, razvoj, komunikaciju, identitet i zadovoljstvo građana. Korišćenjem dostupnih izvora i AI podrške, istraživanje nudi preliminarnu interpretaciju pozicije Trebinja unutar savremenih tokova razvoja Brenda grada. Metodologija se zasniva na opisnoj analizi i obradi podataka iz postojećih izvora, uz eksperimentalnu primjenu ChatGPT-a za analizu i tumačenje informacija. Ograničenja ovog pristupa proizlaze iz toga što model ne koristi aktuelne, stvarno vremenske podatke i ne može zamijeniti empirijska istraživanja, već služi kao njihova dopuna kroz simulacije i analitičku podršku. Shodno tome, neophodno je ove nalaze nadograditi primarnim istraživanjima, lokalnim anketama i statističkim izvještajima, kako bi se osigurala sveobuhvatnost i validnost donesenih zaključaka. Upotreba vještačke inteligencije se u tom smislu može posmatrati kao podrška istraživačkom procesu, ali ne i kao zamjena za klasične empirijske metode.

Ključne riječi: brendiranje grada, dimenzije Brenda grada, vještačka inteligencija, ChatGPT-a, analiza Brenda grada.

Assessing of the City Brand of Trebinje through the Lens of Artificial Intelligence

Abstract: In the contemporary digital environment, city brand goes beyond traditional approaches and increasingly incorporates modern technologies, especially artificial intelligence (AI). This paper analyzes the city brand of Trebinje through the lens of place branding, using the ChatGPT model as a tool for processing and interpreting secondary data. The focus is on six key dimensions of the city brand: perception, attractiveness, development, communication, identity, and citizen satisfaction. Using available sources and AI support, the research offers a preliminary interpretation of Trebinje's position within contemporary city branding development trends. The methodological approach relies on descriptive analysis and the synthesis of secondary data, along with the experimental use of ChatGPT for processing and interpreting information. The limitations of this approach lie in the fact that the model does not utilize real-time data and cannot replace empirical research, but rather complements it through simulation and analytical support. Consequently, it is necessary to complement these findings with primary research, local surveys, and statistical reports to ensure the comprehensiveness and validity of the conclusions. The use of artificial intelligence in this context can be seen as a support to the research process, but not as a replacement for traditional empirical methods.

Keywords: City Brand, Dimensions Of The City Brand, Artificial Intelligence, Chatgpt, City Brand Analysis

1. Introduction

In the digital age, a city's brand is no longer built solely through physical infrastructure, cultural offerings, or local policies, but increasingly through its digital presence and interaction with target audiences via modern communication channels (Joshi et al., 2025). In this context, technological innovations - particularly artificial intelligence (AI) - play an increasingly important role in shaping perceptions of a city and positioning it within the broader socio-economic environment.

City branding is becoming an increasingly significant element of local development in the context of globalization and digital transformation. As cities compete more intensely for the attention of investors, tourists, professionals, and the general public, it is essential for them to develop a recognizable, attractive,

and clearly positioned identity. In this process, modern technologies such as generative artificial intelligence (GAI) offer new possibilities within the scope of digital marketing (Abrokwah- Larbi, 2023).

As Benedek (2017) emphasizes, city branding represents a strategic approach that allows territorial units such as cities, regions, and countries to build a unique and recognizable image, similar to how products and services are branded. This approach not only contributes to international recognition but also stimulates innovation, investment, a shared civic identity, and overall development. A strong brand can motivate the creation of new businesses, the development of recreational content, and the general growth of the local community (Parkhomenko, 2023).

A city brand encompasses both mental and emotional associations. Mental associations are linked to the city's identity - its history, culture, and values - and tend to be stable and long-lasting (Mohammed et al., 2020). Emotional associations, on the other hand, relate to the perception and image of the city as formed by external target groups such as tourists, investors, or potential residents, and are more subject to change (Abdulla et al., 2023).

The strength of a city brand lies in the synergy between these types of associations, and research shows that a strong and consistent brand can enhance a destination's competitiveness, attract capital and human resources, and contribute to sustainable development (Ma et al., 2019).

The use of artificial intelligence (AI) and large language models (LLMs) in place branding research is still in its early stages, but their potential is evident. As Goemann (2022) notes, such tools require a comprehensive social approach that considers the benefits, challenges, and ethical issues that accompany their use - particularly when applied to the analysis of city and regional images.

In this study, ChatGPT - an open artificial intelligence tool developed by OpenAI - is used as an alternative analytical framework based on LLM technology for evaluating the city brand of Trebinje. The research is grounded in contemporary models and theories of place branding, with a focus on six key dimensions: perception and image, attractiveness, economy and development, communication and digital presence, identity and authenticity, and citizen satisfaction.

By using ChatGPT, this study aims to provide a preliminary interpretation of Trebinje's position within current trends in city brand development. Trebinje, as a city with rich cultural and historical heritage, natural beauty, and a distinct Mediterranean character, represents an excellent example of a locality where identity and brand development can be analyzed at the local level.

The subject of this research is the analysis of the city branding of Trebinje from the perspective of contemporary place branding, with support from AI as an auxiliary tool. The aim of the paper is to identify Trebinje's potentials, advantages, and challenges in the process of creating a sustainable and recognizable city brand, relying on existing data sources and interpretation through LLMs.

The methodological approach includes descriptive analysis and synthesis of secondary data, as well as experimental use of ChatGPT for data processing and interpretation. The limitations of this approach lie in the fact that the model does not use real-time data and cannot replace empirical research, but rather supplements it through simulation and analytical support.

2. Literature Review

Cities play a key role in endogenous development due to their developed production systems that drive economic dynamics and create opportunities for networking. City branding can be described as a complex process involving the development of a city's marketing image through various communication strategies (Bonakdar and Audirac, 2020).

The aim of this process is to shape perceptions and associations that target groups have about a particular place, thereby enhancing its competitiveness and attracting investments, tourists, and talent.

The strategy of city branding is also applied as a response to population growth and the need to make tourism, investment, and trade increasingly competitive within the city. However, this strategy is not new. There is evidence of its application as early as the 19th century, and it has intensified with the rise of globalization (Zamudio et al., 2021).

City branding is a strategic tool that helps cities stand out amidst increasing global urbanization and competition (Ali and Khayat, 2024). At its core lies the creation of a unique and attractive identity that is recognizable and appealing to residents, visitors, and investors like.

The concept of city branding is gaining importance as cities increasingly recognize the need to position themselves as brands that transcend geographical boundaries. The goal is to establish a connection and create a recognizable identity among residents, visitors, companies, and individuals (Kavaratzis and Ashworth, 2006). As city management becomes more complex, the need arises for effective tools to identify opportunities and threats in the development of each city.

City branding is based on several key elements. Identity and image form the starting point, defining the city's unique character, including its cultural heritage, architecture, natural beauty, economic activities, and social structure (Ali and Khayat, 2024). Creating a strong brand image involves the strategic use of visual elements and narratives to highlight these attributes (Richards, 2020). Particular emphasis can be placed on the historical and cultural importance of landmarks, as well as on the visual characteristics of architectural heritage. Competitive positioning requires a detailed analysis of the city's strengths and weaknesses compared to others, to ensure competitiveness in the market (Anholt, 2007).

In recent years, the literature on the application of artificial intelligence (AI) in marketing has grown rapidly, reflecting increasing interest from entrepreneurs, consultants, and academia. While earlier research was mainly practice-driven, more recent studies show growing involvement of academic authors who examine the potential and challenges of AI technologies in branding, especially in creating brand image and communicating brand values (Pedroso, 2025).

In modern AI research, particular attention is given to Large Language Models (LLMs), which enable advanced language processing, understanding, and generation (Huang and Rust, 2021; Verma et al., 2021). AI-based tools such as ChatGPT are increasingly used in marketing strategies and business routines, functioning as a digital alternative to traditional machine learning models, with the ability to recognize patterns and make decisions based on new datasets (Pedroso, 2025).

In this context, ChatGPT is defined as a system capable of learning from data, identifying patterns, and making autonomous decisions with minimal human intervention. Although earlier research in this area was dominated by consulting firms and practitioners, recent years have seen growing attention from academia (Chintalapati and Pandey, 2022; Verma et al., 2021), particularly in future research on branding (Oh et al., 2020). AI significantly transforms marketing and consumer behavior by building knowledge from existing sources, as well as through interaction with practice (Davenport et al., 2020). Nevertheless, despite its advantages, this technology raises new concerns - particularly regarding data security, the balance between personalization and privacy, and ethical implications.

Following the recommendations of Mariutti & Florek (2022), there is a growing emphasis on the need for further interdisciplinary research in the field of place branding, as well as the development of more sophisticated methods for critical evaluation with clearly defined research objectives. In this context, artificial intelligence (AI) represents one of the modern tools that can significantly contribute to understanding city brands.

Future research perspectives in branding are moving toward changes resulting from the intersection of technology, brands, and social interaction (Oh et al., 2020) - a dimension still underrepresented in place branding studies. For this reason, the application of tools like ChatGPT, combined with theoretical foundations of this field, may be key to advancing academic insights. In this way, the present research contributes to the growing body of literature on the role of artificial intelligence in the social sciences. Although examples of AI use in academic studies remain limited, they can play a vital role in enhancing scientific inquiry, particularly in relatively well-developed fields such as city branding, which are of interest to researchers, practitioners, and policymakers around the world (Florek and Pamment, 2024).

3. Research Methodology

The methodological approach includes a descriptive analysis and synthesis of secondary data, as well as the experimental use of ChatGPT for processing and interpreting information. Primary data were obtained from a publicly available corpus that includes information on tourist visits, while secondary data are based on existing theoretical sources and academic literature in the field of city branding.

In this study, the open artificial intelligence tool OpenAI (ChatGPT) was used as an alternative large language model (LLM). Its application enabled interpretative data processing and categorization, with the identification of potential patterns, theoretical-practical insights, and inconsistencies within the city branding concept.

The criteria for measuring the city brand of Trebinje in this research are based on contemporary theories and models in the field of place branding, with a focus on: perception and image, attractiveness, economy and development, communication and digital presence, identity and authenticity, and citizen satisfaction. Simon Anholt (2007), one of the founders of the concept of nation and city branding, emphasizes the importance of image and perception as key factors of international recognition and competitiveness. His methodology, known as the Nation Brands Index - later extended to cities - includes aspects such as culture, people, governance, investment, and tourism.

Kavaratzis and Ashworth (2005) developed a layered model of city branding that includes the city's physical characteristics, symbolic representations, and stakeholder behavior. This approach highlights the importance of communication, identity, and local authenticity, directly related to the criteria used in this study.

Zenker and Braun (2010) introduced the concept of participatory city branding, where citizen satisfaction, sense of belonging, and their role as brand ambassadors play a crucial role. They also emphasize the need to measure economic indicators and digital presence in urban brand management strategies.

Hospers (2011) places special focus on smaller and transitional cities, stressing the importance of local culture, symbolism, and the actual quality of life in building a sustainable image and long-term attractiveness.

Based on these approaches, six criteria were formulated and used to analyze the brand of the city of Trebinje, combining both theoretical and practical components of measuring urban identity and attractiveness:

1. Perception and image of the city,
2. Attractiveness and appeal,
3. Economy and development,
4. Identity and authenticity of the city,
5. Citizen satisfaction,
6. Communication and digital presence.

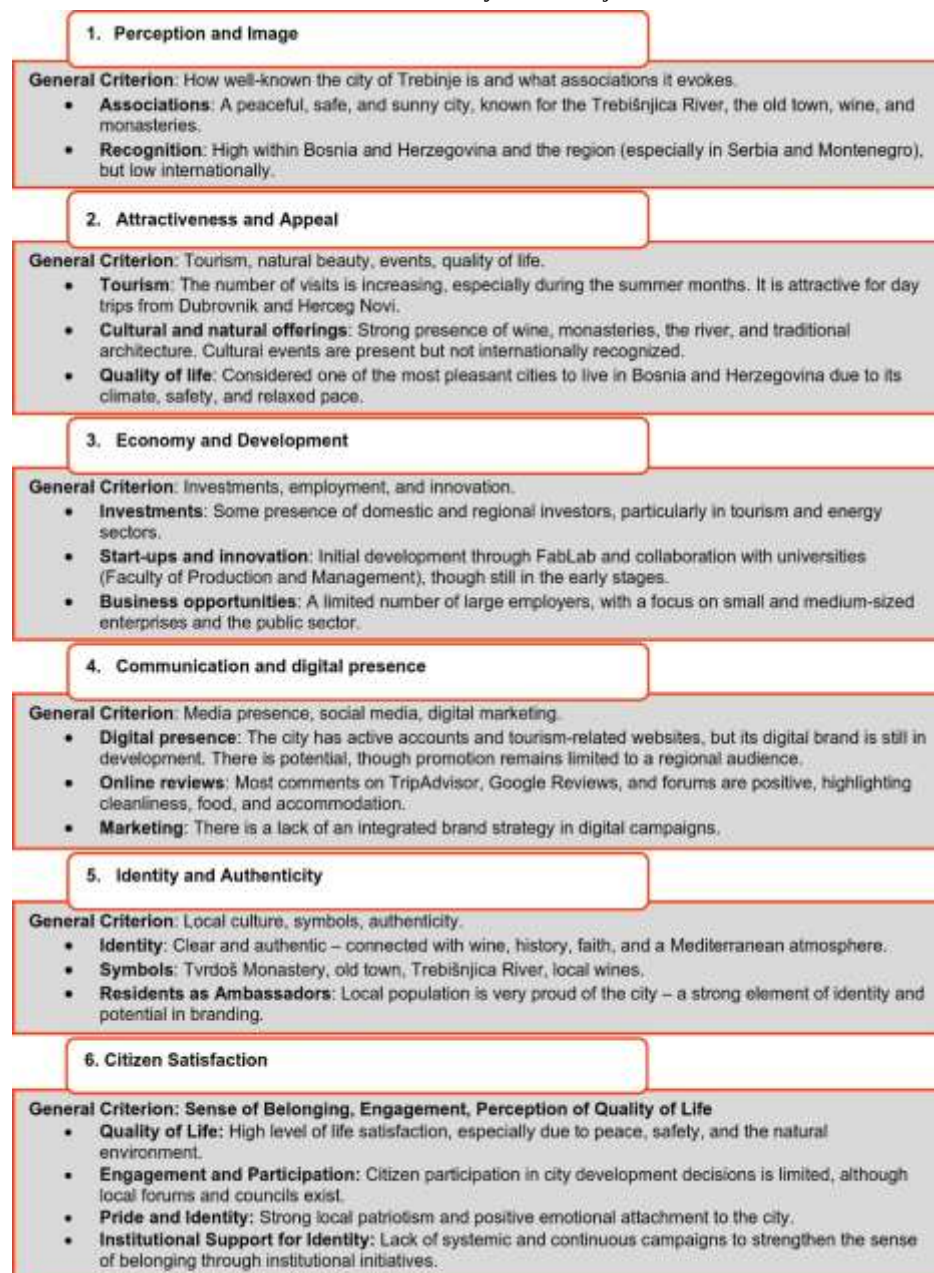
4. Research Results

The applied methodology was implemented using the case of the city of Trebinje, with results presented across six thematic areas developed with the help of ChatGPT (version up to 2024). The research was conducted in April 2025, and the focus of the interpretation was on analyzing theoretical relevance, potential grouping of indicators, as well as observed discrepancies in the results.

The aim of the analysis was to compare theoretical and AI-generated outputs, identify patterns, and highlight inconsistencies.

Artificial intelligence has undergone a paradigm shift - from a rule-based approach to one based on data and insights through deep learning (Kumar et al., 2019; Pedroso, 2025). This reflects back on the purpose and scientific contribution of this research.

Figure 1: ChatGPT (OpenAI, 2024) Response on the Comparative Analysis of City Brand Measurement Criteria: Six Detailed Items for the City of Trebinje



Source: (Author)

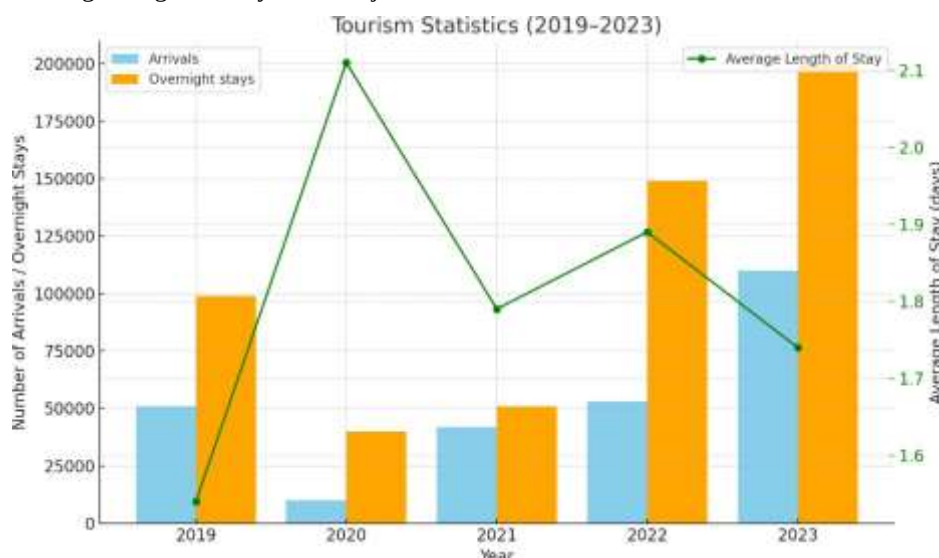
The results generated using the artificial intelligence tool ChatGPT (version up to 2024) enabled the production of structured descriptions for each of the six criteria used to assess the city brand, with direct application to the city of Trebinje. For each question related to the individual criteria, the AI produced textual responses of approximately 300-400 words, featuring clearly categorized data and interpretation in relation to both the general framework and the specific local context. Figure 1 presents a comparative overview of the results.

Although it is clear that all six points intersect with the perceptual priorities that define the reputation of any successful urban city, there is a noticeable lack of verified data and complete information - particularly in areas such as technical depth, media framing, and scientific argumentation. This very lack represents a space for further validation and refinement of the conclusions derived through artificial intelligence tools, by combining them with primary research and local branding strategies.

The presentation of primary data on tourist visits is shown in Figure 2.

These data provide insight into tourism visit trends, enabling a deeper understanding of the current situation regarding the branding of Trebinje. The analyzed data will serve as a basis for further interpretation and identification of key factors that shape the city's image and development.

Figure2: Average Length of Stay in Trebinje



Source: (Statistical Office of the Republic of Srpska (Cities and Municipalities of RS) and the Tourist Organization of the City of Trebinje, 2023)

According to available data, tourism in Trebinje has shown a strong recovery after the pandemic, with a record 201,076 overnight stays registered in 2023. Of this number, 32% (64,308 overnight stays) were generated by domestic tourists, while foreign tourists accounted for 68% (136,768 overnight stays). Compared to the previous year, the number of arrivals in 2023 increased by 48% (index 148), while the number of overnight stays rose by 36% (index 136). The largest contribution to this growth came from foreign tourists.

The ALS (Average Length of Stay) was highest during the pandemic year (2.11 days), likely due to travel restrictions that led visitors to stay longer at safe and smaller destinations. In the following years, ALS values fluctuated between 1.74 and 1.89, indicating a stable but relatively short average visit. Although the number of visits is increasing, there is room for strategies aimed at extending tourists' stays through additional attractions, events, and cultural offerings.

5. Discussion

The research findings suggest that there is significant room for improving the branding of Trebinje as a multi-day stay destination. Although Trebinje holds considerable potential - including natural resources, cultural heritage, and a favorable geographic location - there is no unified branding strategy that cohesively represents the city's identity. Promotional activities are most often carried out in a sectoral and isolated manner, which prevents the creation of a consistent and recognizable narrative.

Key recommendations include the development of an official Brand Strategy for the City of Trebinje, which would define the vision, goals, values, and key messages, while connecting the sectors of tourism, culture, economy, education, and sustainability.

In addition, this paper utilizes the ChatGPT model, an artificial intelligence-based tool, to support the analysis of secondary data on tourism traffic and the city brand. This approach enabled the rapid and efficient generation of an analytical framework based on available sources, previous research, and contextual patterns. Although the use of artificial intelligence represents a significant advancement in analysis, it is important to emphasize that the data generated by this model cannot replace primary research. ChatGPT does not use real-time information, and the data it produces represent interpretations of previously learned patterns, which may affect the accuracy and timeliness of the results.

Therefore, while artificial intelligence is an efficient tool for analysis, the research process should also rely on classical empirical methods, such as primary research, local surveys, and statistical reports. These data sources allow for the validation of findings and offer deeper insight into the specific characteristics of the local market and visitor behavior. The use of artificial intelligence can be extremely valuable as a support tool in the research process, but it should not be used as a substitute for traditional methods that enable the collection of verified and concrete data.

6. Conclusion

In this analysis, artificial intelligence tools - specifically the ChatGPT model - were used to support the synthesis and structuring of data related to the development of tourism and the brand of the city of Trebinje. This approach enabled the rapid creation of an analytical framework based on available secondary sources, previous research, and contextual patterns.

However, this methodological approach has certain limitations. Primarily, the data generated through ChatGPT do not originate from directly verified sources but represent interpretations of previously learned patterns. Furthermore, the model does not use real-time information unless explicitly provided, which may affect the timeliness of the data. Additionally, a clear methodology for data collection and processing is lacking, so it is advisable to view this information as a supplement to primary research rather than a substitute for it.

The analysis of Trebinje's tourism potential and city brand indicates a positive development trend, especially in the post-pandemic period, marked by growing international visibility and high tourist satisfaction. Nevertheless, results partially derived with the support of the ChatGPT model carry certain methodological limitations, as they are based on secondary data without direct empirical validation.

Accordingly, these findings should be complemented with primary research, local surveys, and statistical reports to ensure the comprehensiveness and validity of the conclusions drawn. The use of artificial intelligence, in this context, can be seen as a support tool in the research process, but not as a replacement for traditional empirical methods.

Therefore, the future development of the Trebinje city brand should be based on clearly defined indicators, a comprehensive strategy, and openness to innovations that include the active participation of citizens, institutions, and technology. Such an approach can ensure a long-term sustainable and recognizable identity for the city - both for its residents and the broader public.

Ultimately, successful brand management of the city of Trebinje requires strategic planning, institutional support, integration of the local community, and modern communication approaches. Through the implementation of the proposed measures, it is possible to strengthen Trebinje's position as a dynamic and authentic city that balances tradition with modern development.

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