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Cultural Tourism Management: Advanced Tools and Technologies

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Abstract

In today's world, technology plays a crucial role in almost every business sector, and its development significantly influences tourism. Considering that innovation is recognized as a key factor of competitive advantage in the global market, organizations are increasingly adopting new tools, techniques, and strategies that shape specific marketing activity programs. This research focuses on analyzing modern digital technologies, such as Artificial Intelligence (AI), Blockchain, and Virtual Reality (VR), which have the potential to significantly enhance cultural tourism. Innovations in technology offer opportunities to improve visitor experiences through personalized content, interactive tours, and the digitization of cultural heritage, while also enabling more efficient management of tourist destinations. The paper examines how AI tools can enhance user experiences through interactive guides, visit recommendations, and behavioral analysis of visitors. The role of AI in preserving cultural heritage is also highlighted, including digitization, restoration, and reconstruction of monuments. The second is the role of blockchain technology's potential for ensuring transparency, automating processes (such as smart contracts), verifying the authenticity of artifacts, and creating innovative systems for managing tourism activities. Also, the paper examines technological solutions for cultural tourism, which include the use of digital platforms and virtual reality to enable interactive and accessible presentation of cultural content to a wider audience. The focus of the research is on Serbia as a case study, with comparisons to examples from other European and global destinations. This study aims to demonstrate how the innovative application of technologies can contribute to the preservation of cultural heritage, enhance visitor experiences, and create a competitive advantage in the field of cultural tourism.

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Keywords

Cultural tourism; Cultural heritage; Information and communication technologies; Digitization; Artificial intelligence; Blockchain technology

1. Introduction

The concept of cultural tourism emerged in academic literature between the 1970s and 1980s, defined as travel to visit famous landmarks, view artworks, or participate in events. (Adams, 2008). Until two decades ago, cultural tourism was a small 'niche' in the tourism market, focused on visits to well-known locations, sightseeing historical buildings, artworks, and cultural events. Today, cultural tourism is recognized as one of the main subtypes of tourism. Cultural tourism has existed since ancient times, and Herodotus of Halicarnassus in his work "Histories" describes the nature, cities, population, and customs of Babylon, Syria, Egypt, and Asia Minor (Dinić, 1990). Over the centuries, the concept of cultural tourism has evolved. In the book "Voyage to Italy" by Richard Lasek, published in 1670, the term "Grand Tour" was introduced. During the 17th and 18th centuries, this tour was considered an important experience for the

education of young aristocrats. Tourists embarked on these extensive journeys with a clear motivation: acquiring new knowledge and skills for careers in diplomacy and banking. Thomas Cook is particularly significant for developing tourism, as he organized "package tours" to European cities. The main motivation for these trips was culture, so these packages are equated with today's cultural routes. Cultural tourism is most often defined as a form of tourism in which cultural attractions are the main reason for visiting a destination, offering the tourist the opportunity to understand and appreciate the essence of the place. (Richards, 2010). Today, according to the World Tourism Organization, cultural tourism will continue to grow and evolve in the future, adapting to changes in technology, society, and traveler preferences. Digital technologies already play a significant role in cultural tourism, enabling virtual tours, interactive content, and personalized travel experiences. Nowadays, we cannot imagine any aspect of life without the use of computers, smartphones, and other digital devices. Gradually, digital technologies have found their way into the domain of cultural tourism and have become an indispensable part of trip planning, during the journey itself, and after the trip. Can digital technologies determine the value of cultural tourism, or is the value of cultural tourism determined by digital technologies?

With the rise and increasingly intensive use of smartphones and tablets in everyday life, new methods of presenting cultural material are being demanded. For instance, innovative techniques can transform the restrictive environment of museums, turning passive objects that visitors merely observe into active subjects that can provide new information.

Digital tools enhance the accessibility of cultural heritage while simultaneously bridging the gap between people and cultural-historical monuments. The development of information and communication technologies has empowered tourists to independently explore destinations, reserve, and purchase services. (Porter & Heppelmann, 2014). The integration of culture and technology is now a fundamental aspect of tourism destination strategies. "Cultural capital in a city acts as a magnet for tourism, a trend that is further intensified through the use of digital technology." (Kourtit, 2019). Technologies in the field of cultural and heritage tourism are significant in both applied projects and academic research on current and future trends in cultural tourism (Richard, 2018).

2. Methodology

Relevant literature, including academic papers, professional books, monographs, and publications, will be used in this research. The research methodology is grounded in three key areas:

- **Virtual Cultural Tourism:** Expert literature was primarily used to define this term, and examples of virtual cultural tourism in Serbia and other European countries were provided. Additionally, the descriptive method was employed to thoroughly present the characteristics and functions of the technologies used, offering insights into their practical applications.
- **Artificial Intelligence:** The research utilized the methods of observation and comparison to examine various examples in different contexts, highlighting both positive and negative effects.
- **Blockchain Technology:** Relevant literature from universities, along with scientific and research papers by scholars and researchers, was used. The research adopted the method of deduction, allowing the author to derive new conclusions based on established findings according to a defined procedure.

The research and data collection process spanned several months to ensure relevant and valid results. Two primary methods were employed in writing this research paper:

- **Primary Method:** This involved collecting and analyzing data through observation techniques, interviews, and literature studies to gain an in-depth understanding of the subject. The research data was further reinforced by discussions with experts in the fields of artificial intelligence and blockchain technology.
- **Secondary Data:** Obtained through literature studies, including scientific references related to cultural tourism. This approach enabled a deeper understanding of current trends, challenges, and practices in the industry, as well as the identification of relevant information that supports or further explains the primary research findings.

After data collection, a detailed analysis was conducted to identify trends, patterns, and conclusions regarding the application of modern tools in cultural tourism. Additionally, the conclusion discusses the impact of the research, indicating how the author's findings can contribute to improving the comparative and competitive advantages of cultural tourism. (See Figure 1)

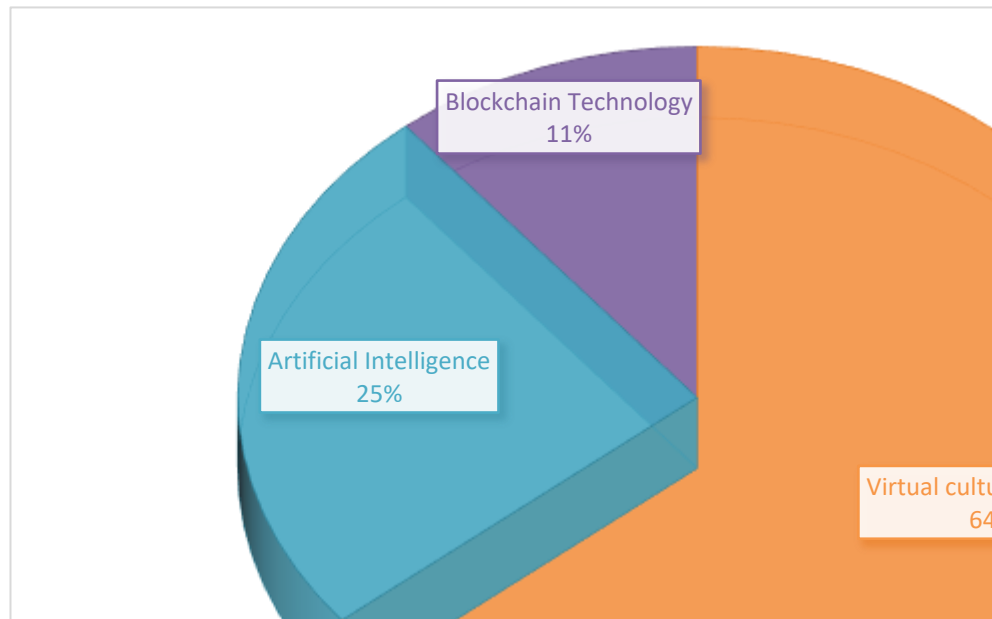


Figure 1: A diagram representing the presence of technology in cultural tourism today (made by the author)

3. Results

The research findings are divided into three key areas: virtual cultural tourism, artificial intelligence, and blockchain technology, highlighting their roles, applications, and implications in cultural tourism.

3.1. Virtual Cultural Tourism

The research results reveal that virtual cultural tourism has emerged as a powerful tool for enhancing accessibility and engagement with cultural heritage. Key findings include:

- **Technological Innovations:** Examples of virtual cultural tourism in Serbia and across Europe demonstrate the successful use of 3D modeling, virtual tours, and augmented reality (AR) in preserving and promoting cultural heritage.
- **Practical Applications:** Descriptive analysis identified that virtual platforms provide users with immersive experiences, bridging geographical distances and offering a new form of interaction with cultural sites.
- **Key Advantages:** The adoption of these technologies improves educational outreach, promotes sustainable tourism, and attracts a broader audience, particularly younger generations.

3.2. Artificial Intelligence (AI)

The study demonstrates that artificial intelligence is reshaping the cultural tourism sector through observation and comparative analysis of various AI applications:

Positive Impacts:

- **Enhanced User Experience:** AI chatbots and recommendation systems improve visitor engagement by offering personalized cultural itineraries and real-time information.
- **Data-Driven Insights:** AI-powered analytics enable cultural institutions to monitor visitor preferences and optimize their offerings.

Negative Impacts:

- **Job Displacement:** Automation of certain tasks, such as guided tours, may reduce human involvement in cultural tourism.
- **Ethical Concerns:** Issues related to data privacy and biases in AI systems were identified as significant drawbacks.

3.3. BlockChain Technology

Some institutions have adopted blockchain-powered loyalty programs, where visitors earn tokens for participating in cultural activities. These tokens can be redeemed for discounts or exclusive experiences, fostering repeat visits and deeper engagement. The research identified the following key results regarding the application of blockchain technology in cultural tourism:

- **Provenance Verification of Cultural Artifacts** - Blockchain is effectively used to verify the authenticity and provenance of cultural artifacts and artworks. Museums and cultural institutions utilize blockchain records to ensure transparency and traceability in the acquisition process, preventing illegal trade and forgery.
- **Decentralized Ticketing Systems** - Blockchain-based ticketing systems are being implemented to reduce fraud and ensure secure transactions. These systems provide tamper-proof digital tickets, increasing trust between cultural institutions and visitors while reducing administrative costs.
- **Smart Contracts for Cultural Events** - Smart contracts are applied to manage agreements for cultural events, exhibitions, and partnerships. These contracts ensure that funds are released only when predefined conditions are met, improving accountability and efficiency.
- **Digital Asset Management** - Blockchain is used to manage and safeguard digital representations of cultural heritage, such as virtual tours, 3D models, and digital archives.

It provides a decentralized and secure platform for storing and sharing cultural assets, ensuring their preservation and protection from unauthorized use.

4. Discussion

Several authors and non-governmental organizations (NGOs) argue that cultural tourists are driven by distinct motivations compared to other tourists. Therefore, they emphasize the importance of considering motivation as a key element in defining cultural tourism. Cultural tourism is inherently experiential, providing tourists with educational opportunities to learn about the significance of a place and its connections to the local community (McKercher & Cros, 2002). The 21st century has witnessed numerous innovations and technological advancements that have profoundly influenced the evolution of trends in cultural tourism. This type of tourism is increasingly significant each year and plays a pivotal role in driving revolutionary shifts in societal development.

Virtual cultural tourism stands out as one of the most significant trends in the tourism industry. While Virtual Reality (VR) has been used in tourism since the 1990s, it was not until the early 2010s that virtual cultural tourism gained prominence.

Tourism experts consider VR a powerful marketing tool that offers potential tourists a "try before you buy" experience, allowing them to preview destinations virtually. Moreover, VR is hailed for its sustainability benefits, enabling tourists to explore destinations without causing physical damage or degradation to the actual locations (Guttentag, 2010).

In addition to its marketing and sustainability advantages, VR platforms like Second Life (SL) have emerged as influential internet-based environments. These platforms facilitate a wide range of activities, including virtual tourism, where users can interact with simulated environments and cultural sites. Second Life exemplifies how virtual environments can enrich cultural tourism experiences by providing immersive interactions and educational

opportunities about historical and cultural landmarks. This evolution underscores the transformative impact of digital technologies on cultural tourism, reshaping how destinations are marketed and experienced in the 21st century. Second Life (SL) allows people to explore various destinations created and promoted by individuals and companies. These virtual destinations can be simulated versions of real-world places like Venice, Paris, or London, or they can be entirely imaginary locations. Virtual tourists in SL can visit a diverse range of sites categorized into themes such as romantic places, beaches, artistic venues, bars, and natural parks. There are virtually no limitations on residents in creating or visiting destinations, leading to the proliferation of replicas—such as at least seven different versions of the Eiffel Tower.

A notable aspect of SL is the potential for destinations to 'expire' and disappear under certain conditions, such as non-payment of rent, expired contracts, or termination of land access due to legal issues. For example, the virtual city of Amsterdam in SL offers a variety of experiences including flower stalls, cafes, bicycles, and boat rides. Dublin Virtual Live hosts approximately 35 weekly events ranging from concerts and performances to lectures, while New Berlin provides German language classes and diverse cultural events.

These virtual environments offer a unique opportunity to experience destinations without physical travel, which is particularly beneficial for individuals with limited travel opportunities. This aspect underscores the role of virtual platforms like SL in democratizing access to cultural and educational experiences worldwide. For example, women in Iran, according to Islamic law, can't travel without their husband's permission if they are married, and if they are unmarried, without their parent or guardian's permission.

Rokhshad Tavakoli and Paolo Mura in 'Journeys in Second Life' – Iranian Muslim women's behaviour in virtual tourist destinations explained how Iranian Muslim women "traveled". As Second Life provides opportunities for people to create 'customized' avatars before they enter the virtual world, part of the findings of this study unveils how the women interviewed chose their avatars before they traveled to virtual tourist destinations. For all the respondents the choice of the avatar involved a long and complex decisional process. One woman, for example, spent 5 h selecting her avatar and finding the 'proper' dress for it. Iranian women attempted to avoid imperfections in their representations of their selves and refused to select non-human avatars as they did not (Tavakoli & Mura, 2015).

4.1. What is the situation in the Balkans with virtual reality in tourism?

Specifically, in Serbia, virtual reality projects have been implemented for the Manasija Monastery and the Ravanica Monastery, both of which are categorized as immovable cultural properties of exceptional significance (See Figure 2&3). The monasteries are unique historical and cultural monuments that bear witness to centuries of tradition, culture, and history of the Serbian people. In fact, 54 monasteries have been declared cultural monuments, and there are also sanctuaries that are protected at the international level. The Witch Mare's House in Svetvinčenat, Croatia, is an excellent example of how a former small town is becoming a center of cultural tourism in the Istria region. The center is dedicated to diverse material and intangible cultural heritage, interpreted through modern technologies: 3D mapping, and virtual, and augmented reality.

In addition to virtual reality, virtual tours are emerging as an effective tool for presenting Serbia's cultural heritage to a global audience. Virtual tours offer immersive and interactive experiences, allowing users to "walk through" monasteries, museums, and historical sites from anywhere in the world. These tours often incorporate high-resolution 3D models, panoramic views, and detailed information about the site, providing a comprehensive experience for users. Here are some examples of virtual tours showcasing Serbia's cultural heritage: Kalemegdan and Belgrade Fortress, Smederevo Fortress, Viminacium, and Golubac Fortress.



Figure 2: Ravanica Monastery (taken by the author)

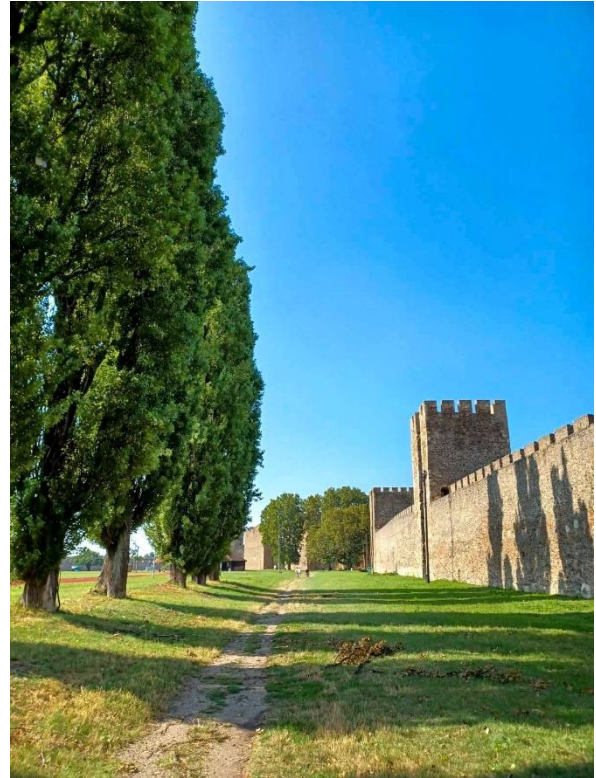


Figure 3: Smederevo Fortress (taken by the author)

Virtual reality (VR) is an innovative technology that has made substantial contributions to the advancement, management, and sustainability of cultural tourism. Increasingly, tourism companies are integrating VR and augmented reality (AR) to offer tourists immersive and interactive experiences. These technologies provide innovative ways for tourists to gather information and experience specific attractions or destinations both before and after their trips (Winkler & Ohlei, 2019). An interesting example is the Camino de Santiago 360 app. This application allows users to experience the pilgrimage route in an immersive way, using interactive VR technology. By wearing VR glasses, users can step into the shoes of a pilgrim, enhancing their understanding and engagement with the journey. The app functions as an interactive guide, combining documentary-style information with interactive features (Paolis & Bourdot, 2020).

As technology advances rapidly, Mixed Reality (MR) is gaining popularity, especially for co-creating cultural heritage and tourism experiences, appealing particularly to Generation Z. The key distinction between Augmented Reality (AR) and Mixed Reality lies in their interaction with the physical world. In AR, digital elements are overlaid onto the physical environment in real-time but typically do not interact with it directly. This technology enhances real-world views with additional digital information, enriching user perception.

On the other hand, MR goes further by integrating digital elements that not only overlay but also interact with the physical environment. This interaction allows for more immersive and dynamic experiences where virtual objects can respond to and interact with real-world surroundings in real-time. Unlike Virtual Reality (VR), which completely immerses users in a virtual environment isolated from the physical world, MR seamlessly blends digital content with the real world to varying extents, enhancing the user's perception and engagement with their surroundings.

This evolution in technology not only transforms how cultural heritage and tourism are experienced but also caters to the preferences and expectations of modern audiences, particularly those belonging to Generation Z, who value interactive and immersive digital experiences. Therefore, VR technology completely ignores the environment in which the user is in, whereas MR experiences process the environment in which the user is in and include it in the experience. Similarly, in a VR experience, the user only interacts with the virtual environment, whereas in an MR experience, the user interacts with both virtual and physical elements (Stienmetz, Ferrer-Rosell & Massimo, 2022). The most popular example of MR is The City VR Experience, which is an immersive virtual reality experience. It allows gamers to discover new perspectives to look upon the world we live in like never have done before. Dozens of roads, structures, cars, and diverse metropolitan areas are available in the game, each of which has a real-life counterpart. City VR is

more than just a 3D plan- it provides a revolutionary way to design environments using a range of perspectives. Gamers may wander through the city like a giant, see objects from above and below, scale in and out, alter the climate, and take great photos. It provides a thorough glimpse of any location the player desires to visit (Stienmetz, Ferrer-Rosell & Massimo, 2022). Video games have garnered attention in education, health, and various non-gaming sectors, including tourism. Their appeal lies in the unique ability to allow players to freely explore virtual worlds, simulating the experience of leisurely strolling through new environments like tourists (Dubois, Griffin & Gibbs, 2021).

In video games, gamers are called to adventure to explore in-game locations (Sajid, 2018), thus, player-tourists have the opportunity to learn about the destination and its tourist attractions through entertainment. In Serbia, a significant example is the archaeological site Felix Romuliana, for which a mobile application has been created for Android and iOS operating systems. The application presents an interactive game called "Felix Romuliana - Legacy of Conquest," through which visitors explore the site and get closer to the way of life in the Roman Empire. Upon arriving at a certain point, visitors receive information related to that place via Bluetooth beacons, and to move on to the next point, they must answer a question correctly. This innovative approach not only engages visitors in a fun and educational manner but also ensures a deeper understanding and appreciation of the historical and cultural significance of Felix Romuliana. The game includes various challenges and tasks that mimic the daily life, architecture, and military strategies of the Roman Empire, making the experience both immersive and informative. Additionally, the application provides detailed historical context and high-quality visuals, enhancing the overall visitor experience. An interesting example is Assassin's Creed Odyssey, an action role-playing video game set in the years 431–422 BC. The story centers on the Peloponnesian War, an ancient Greek conflict between Athens and Sparta. Within the game, players can virtually explore the culture, history, and beauty of the ancient Greek world. The 'I was there when that happened' experience is what differentiates Assassin's Creed Odyssey from other games (Politopoulos, 2019). Another notable example is Microsoft Flight Simulator 2024, an upcoming flight simulation video game. This version supports virtual reality (VR) through Head Mounted Displays (HMD), bringing a new level of immersion to the simulator. Additionally, other video games like Akhenaton, The Mont-Aiguille, and similar titles allow gamers to explore various destinations with a higher level of interactivity and immersion. These games are becoming increasingly integral elements of communication between cultural attractions and tourists, conveying information in an engaging and enjoyable way.

The way of traveling, as well as the concept of "cultural tourism," has changed over time. Each era has its own characteristics, and the 21st century is a time of innovation, technological development, and progress. Today, cultural tourism does not only involve physical presence at certain destinations but also virtual travel through digital platforms and interactive applications. In the era of digital technologies and technological revolution, artificial intelligence is increasingly becoming part of our everyday lives and has infiltrated the field of tourism and the way we experience heritage.

ChatGPT represents one of the latest models in the GPT series, known for its ability to generate natural and coherent text. ChatGPT is specifically designed for conversation with users, capable of answering almost any question and providing necessary information to the user on a specific topic. A variety of capabilities, for which ChatGPT may be used in e-tourism, which we know can only be partial, include:

- identification of new target markets, e.g., for a mature destination or a new tourism product;
- development of new products, e.g., to deal with climate change challenging ski resorts;
- design and implementation of marketing strategies and campaigns, e.g., to promote new tourism destinations;
- support to operational and management activities, e.g., supporting hotels to deal with human resources shortages;
- improved customer services, e.g., offering more customized travel advice,
- personalize customer experience, e.g., identifying original events during the holiday based on the expectations of the tourist;

- innovate business processes, e.g., OTAs have to change their services by integrating or revising holiday plans created by conversations with ChatGPT (Werthner Alzua-Sorzabal, Cantoni, 2015).

In tourism, AI plays numerous roles and significantly shapes Smart Tourism Destinations (STDs) by enhancing visitor experiences. Smart tourist destinations differ from conventional ones by utilizing cutting-edge technology and leveraging vast amounts of data to create connections among stakeholders, make informed decisions, and ultimately provide tourists with improved travel opportunities while boosting the competitiveness of destinations (Femenia-Serra, Neuhofer, & Ivars-Baidal, 2019). The application of AI in tourism includes various aspects, such as personalized recommendations of tourist attractions and activities, optimization of routes, provision of real-time support through virtual assistants, as well as analysis of visitor data to improve services and experiences. AI also makes it possible to predict tourism trends and create customized marketing campaigns, which helps destinations attract more visitors and better respond to their needs. Thanks to advanced analytical tools, tourism organizations can identify and solve potential problems faster and more efficiently.

For example, Seville has implemented projects such as “Sevilla Smart Accessibility Tourist & Events” to improve accessibility and urban space management through ICT-based actions (GIS technology and AI tools) analyzing and processing all information by establishing corrective actions and designing accessible routes between neighbourhoods, all of which is available for users through the Seville Accessible App. An interesting example is Dublin, also a smart destination, which created the “Culture Near You Map”, an interactive experience that offers visitors and residents the opportunity to view up-to-date information on entertainment and events, culture, people, and places which can be accessed through the web app and reveals the city's wealth of attractions (La Rocca, 2023). When talking about smart cities, Dubrovnik cannot be overlooked, as it is undoubtedly the most popular holiday destination in Croatia, and one of the most popular examples of overtourism, after Venice. Dubrovnik is famous for its project ‘Respect the City’, which uses ICT technologies to measure tourists' presence and impacts and then collects the data and insight into visitor movements and point of interest preferences-providing information and redirecting visitor flows. On that note, the cultural heritage of the city is preserved, the quality of everyday life for citizens is enhanced, and tourists are enabled to have a better experience of Dubrovnik.

In 2020, Gothenburg was nominated as the European Capital of Smart Tourism by the European Commission, recognizing it as one of the most popular smart tourism destinations. The Digital Twin of Gothenburg project, initiated in 2021, allows historical data to be used to view, analyze, and understand the city and its functioning. An example of this is the Living Atlas Indicators provided by ArcGIS Urban (Pasquinelli & Trunfio, 2021). Gothenburg's Digital Twin is an innovative approach that leverages advanced technology to create a virtual replica of the city. This digital model integrates various data sources, including historical, real-time, and predictive data, to offer a comprehensive understanding of urban dynamics. By utilizing the Digital Twin, city planners, policymakers, and stakeholders can make informed decisions to enhance urban development, optimize resource management, and improve the overall quality of life for residents and visitors. In China, the 'City Brain' is a prime example of a smart tourism destination and how AI works. The application of “City Brain” has improved the quality and efficiency of tourism emergency rescue and tourism services. This application enables users to share data about landmarks in the city while directing tourist companies to participate in data collection and exchange results in cultural tourism.

Based on data analysis results, the authorities can provide services such as “find vacancies within 10 s”, “enter the scenic spots within 20 s”, and “annual card for cultural tourism in the Yangtze River Delta” now. Taking the “enter the scenic spots within 20 s” as an example, tourists go to the attraction and open Alipay, scan the payment code, and enter the park directly, reducing time spent in the queue for ticket purchase (Wörndl, Koo & Stienmetz, 2021). According to UNWTO, Since 1996, Venice has become one of the most cited cases for describing the growing problem of overtourism. Smart technologies are considered the most effective solution to tackle the effect of overtourism (Visentin & Bertocchi, 2019). The most significant cities and locations affected by overtourism, also, are: Amsterdam, Dubrovnik, Machu Picchu, Forbidden City, Kyoto, Paris, and Barcelona. These places (Barcelona, Venice, Berlin, Amsterdam) have already developed smart measures to combat the negative impact of overtourism and ensure responsible and sustainable tourism (Séraphin, Gladkikh & Thanh, 2020).

Blockchain technology is a distributed, replicated, and immutable digital ledger, that enables various parties to conduct business with greater trust and transparency, eliminating the need for a central authority to oversee and control transactions (Kumar & Liu, 2019). This innovative system works by recording transactions across multiple computers, ensuring that the data is consistently replicated and protected from tampering. Each transaction is securely linked to the previous one, forming a chain of blocks that is virtually impossible to alter. As a result, blockchain provides a reliable and transparent platform for conducting business, fostering trust among participants by guaranteeing the integrity and authenticity of the information. (Lemieux, 2016).

The key turning point in the evolution of tourism comes with the development of blockchain technology, which has the potential to integrate various tourism services and transform how travelers book their arrangements. This technological advancement has spurred the emergence of startup projects in the tourism sector, leveraging blockchain to create innovative business models. Examples include companies like WebJet, Concierge.io, and tourist agencies that accept cryptocurrencies such as Bitcoin for payments. Blockchain-based cryptocurrencies enable simple, direct, and safe peer-to-peer transactions without the need for trusted third parties. Moreover, blockchain technology can make transactions more equal and distribute similar powers to both providers and consumers of tourism services.

Blockchain-based cryptocurrencies facilitate simple, direct, and secure peer-to-peer transactions, eliminating the need for trusted third parties. Additionally, blockchain technology can create a more equitable transaction environment by distributing similar powers to both providers and consumers of tourism services. This decentralization ensures that all parties involved have equal access to transaction information and the ability to verify data independently. Moreover, blockchain can enhance transparency and trust in the tourism industry by providing a tamper-proof record of transactions. This can help reduce fraud and disputes, as every transaction is recorded on an immutable ledger that can be easily audited. Furthermore, smart contracts—self-executing contracts with the terms directly written into code—can automate and streamline various processes, such as bookings and payments, further increasing efficiency and reducing costs. By virtue of these characteristics of blockchain technology, new players, both small companies and local tourism service providers, would appear in the tourism and hospitality market. As a result, the locals could sell tourism products to the tourists, and in turn, the tourists would access authentic travel experiences (Filimonau & Naumova, 2020). Through blockchain systems, the local businesses that conserve cultural heritage and traditional values as well as small businesses that sell local goods could offer their services and goods directly to the tourists and visitors. Blockchain ensures the transparency, quality, and origin of the data, so the tourists can verify the authenticity of the purchased product and can be sure of its originality. Besides, they could be assured that the prices for goods and services are the same for all. Also, rather than staying at a hotel, the tourists could have an opportunity to stay at some local's house and receive advice on authentic restaurants and/or sacred places to visit. Moreover, since blockchain technology allows to design and create digital currencies, the local community could create their own money. The tourists could use local money to pay for goods and services at the destination, and thus boost the local economy (Tyan & Guevara-Plaza, 2021). An interesting example is the Alastria project in Spain developing digital ID aims to simplify tourist operations by having all the information available about an individual in one place.

Blockchain technology has broader applications in the aviation industry, encompassing almost all areas. It can increase the efficiency of passenger identification and verification, prevent overbooking through the use of smart contracts, and facilitate ticket payments. Several companies are leveraging blockchain technology for travel organization and airline ticket planning, including TravelBlock, TravelGrid, TravelChain, Aeron, and WindingTree.

Winding Tree, a non-profit organization based in Switzerland, has created a specialized blockchain platform that allows users to communicate and make travel-related deals without incurring third-party fees. This platform enables direct interaction between service providers and consumers, fostering a more transparent and cost-effective marketplace. Additionally, by utilizing blockchain's immutable ledger, Winding Tree ensures that all transactions are secure and verifiable, significantly reducing the risk of fraud and enhancing trust among users. The Russian project TravelChai is a platform that allows its users to store personal data in encrypted form, and the digital footprint (countries and places s/he visits, restaurants and cafes s/he eats at, and what kind of recreation s/he prefers) in the open form (Angelova, 2019). Blockchain technology in cultural heritage can be used to create a registry that includes the type and category of cultural assets and all activities performed on cultural assets (type of ownership, technical protection

measures). In this way, blockchain becomes an efficient tool for the protection and creation of digital archives of cultural heritage with documents, photographs, and other important information about cultural assets.

Blockchain technology in cultural heritage can ensure a higher level of protection, transparency, authenticity, and immutability. When data for a specific cultural asset (for example, memorial park "Kragujevački Oktobar" at Kragujevac) are entered using blockchain technology, they can't be deleted, altered, or falsified. Immutability prevents data tampering within the network, whereas blockchain for business uses a shared and immutable ledger that members can only access with permission. Today, centralized databases or paper documents are still used for the cataloging of cultural heritage. These tools can easily be subject to falsification or cancellation, but with blockchain technology that isn't possible (Bacciu, 2019). When visiting a new tourist destination, cultural tourists often visit museums to better acquaint themselves with the culture, tradition, and history of a city, state, or people. It often happens that tourists, when visiting museums, find that some museum objects or collections are currently unavailable due to being exhibited in another museum for an exhibition. It is not uncommon for an object to be damaged during transportation, and theft/misappropriation of cultural objects also frequently occurs. In this case, as well, blockchain technology plays an important role. How? For museums, blockchain technology offers a way to also monitor the location and lending of objects to other institutions (Mucchi, 2022). Also, to prevent fraud, blockchain technology verifies whether the object/item has been obtained through a legally compliant process, which ensures its provenance.

The badges would be numerical designations ranging from 1–5. In this case, '1' would mean the item(s) obtained followed clear and well-established guidelines in the acquisition or how it was obtained in its life history. The designation '2' indicates the object(s) appear to be legal and/or ethical, but documentation is not completely clear, and some doubt is evident in its life history. The designation '3' means there is unclear documentation, and the objects are reasonably likely to have been obtained unethically or illegally. For a designation of '4', the objects are not ethically obtained, at least using given standards, and could be illegally obtained. For items with '5', the objects have clear evidence that they were obtained illegally (Association, 2004).

5. Conclusion

In short, Cultural tourism is one of the most important and simultaneously fastest-growing segments in tourism. The definition of cultural tourism has evolved from its initial vision, which was limited to the movement of people driven by visiting cultural attractions outside their place of residence, to encompassing a broader spectrum of cultural, historical, and natural assets, such as intangible cultural elements, sites, attractions, and events. With the development of the internet, particularly with the evolution of modern technology and smart contracts, tourism has undergone significant transformations. With the emergence of the first websites, many travel agencies showcased their packages about tourist destinations, as well as information about cultural attractions. Gradually, with the advancement of technology, especially in recent years, tourism, particularly cultural tourism, has become increasingly digitized and interconnected with online platforms. Technological progress has led to the development of virtual tours, augmented and virtual realities, and more recently, mixed reality, allowing tourists to explore cultural attractions even when they are not physically present at the destination. Social media platforms such as Facebook, Instagram, and TikTok play a significant role in promoting cultural tourism, but video games are increasingly gaining attention in the promotion and interpretation of cultural tourism. Why? Video games provide a virtual experience of visiting cultural destinations and historical sites around the world. Through games like adventure games or city-building simulations, players can explore various aspects of cultural heritage and learn more about the history, architecture, and traditions of different cultures.

Through entertainment and interaction with innovative examples of cultural attractions, tourists/players are educated, and such games also serve as a marketing strategy. The use of video games allows players to freely roam the virtual world and wander through the destination like real tourists. Similar to virtual tours, players/tourists can learn a lot about the destination (its history, tradition, origin), and assess whether they really want to visit the destination.

ChatGPT is another product of the rapid development of modern technology that can be used in the field of tourism. However, ChatGPT has its shortcomings. For example, it doesn't have access to important travel-related data that can change from moment to moment, such as airline schedules and weather forecasts. Additionally, the software doesn't

always distinguish between reliable and unreliable information on the internet, so it may provide untrue answers. Despite these drawbacks, ChatGPT has its advantages, and there will definitely be work in the future on developing more advanced versions that can assist in many areas, including tourism.

The significance of blockchain technology lies in its ability to ensure the authenticity of digital data. Furthermore, it provides a permanent record of all transactions, with each transaction being verified by a consensus of participants in the system, thereby acquiring the attribute of immutability. Once data is entered, it cannot be deleted or changed, which is important for preserving validity and authenticity not only in the field of cultural tourism but also in other domains. With the help of smart contract, tourism enterprises and their stakeholders can automatically implement the contract content without human interference. Additionally, this can enhance trust among participants in the cultural tourism industry by enabling transparent tracking of costs, revenue, and other relevant information.

Ultimately, technological advancements, including social media, virtual reality, video games, and blockchain technology, are transforming cultural tourism in ways that promise a better experience for tourists and encourage the preservation of cultural heritage worldwide.

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