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Rethinking about Tangible Cultural Heritage Like Architect Sinan in The Digital Age: A Synthesis between The Ages****

Dijital Çağda Somut Kültürel Mirası Mimar Sinan Gibi Yeniden Düşünmek: Çağlar Arası Bir Sentez

ÖZ

Bu çalışma, Mimar Sinan'ın günümüz dijital çağında yaşadığını varsayarak, günümüz ziyaretçilerinin istek, ihtiyaç ve beklentileri doğrultusunda Sinan'ın inşa ettiği mimari mekanların ziyaret deneyimini zenginleştirecek öneriler tasarlamaya çalışmaktadır. Multimedya geliştirme yönteminin adımları esas alınarak Sinan'ın inşa ettiği üç mimari mekan Süleymaniye Camii içi, hazire alanı ve türbe için teknolojiye dayalı öneriler geliştirilmiştir. Yerinde gözlem yöntemi ve gözlem formlarından yararlanılmıştır. Ayrıca Sinan'ın olağanüstü kişiliğini ve yapım tekniklerini ortaya çıkarmak için yazılı kaynaklardan (otobiyografi, kitap, makale, envanter vb.) ve görsel kaynaklardan (belgesel) yararlanılmıştır. Yerinde gözlemlerden elde edilen bulgulara dayalı olarak görsellerle zenginleştirilmiş şu aşamalar önerilmektedir. Birincisi, ziyaretçilerin, cami içerisinde ellerini havada hareket ettirerek sayfalarını çevirebileceği, 1,5x1 metre ölçülerinde, büyük boyutlu bir dijital kitap tasarlanması. İkincisi hazire alanı içerisinde, orada gömülü olan kişiler hakkında ve onların yaşamlarına ilişkin önemli bilgileri içeren bir matris barkod sisteminin geliştirilmesi. Son olarak Sinan'ın kendi hayat hikayesinin sesli anlatımıyla başlayıp, ziyaretçilere türbesinin yerini anlatarak rehberlik eden bir sanal gerçeklik uygulamasının ve simülasyonunun oluşturulmasıdır.

Anahtar Kelimeler: Somut Kültürel Miras, Ziyaretçi Deneyimi, Dijitalleşme, Mimar Sinan, Süleymaniye Camisi, İstanbul.

ABSTRACT

The study is to endeavor to design proposals that will enrich the visiting experience of the architectural sites built by Sinan in line with the desires, needs, and expectations of modern-day visitors, assuming that Architect Sinan lived in today's digital age. Based on the steps of multimedia development method, technology-based recommendations have been developed for three architectural sites: the Süleymaniye Mosque, its cemetery area, and the tomb, all of which were constructed by Sinan. The on-site observation method and observation forms were utilized. Additionally, written sources (such as autobiographies, books, articles, inventories, etc.) and visual sources (documentaries) were consulted to explore Sinan's exceptional personality and construction techniques. Based on the findings from on-site observations, the following stages, enriched with visuals, are proposed as recommendations: designing a large-sized digital book, measuring 1.5x1 meters, where visitors can turn the pages by moving their hands in the air inside the mosque. Developing a matrix barcode system within the cemetery area, containing information about the individuals buried there, including important details about their lives. Creating a virtual reality application and simulation that starts with an audio narration of Sinan's own life story and then guides visitors to his tomb by describing its location.

Keywords: Tangible Cultural Heritage, Visitor Experience, Digitalization, Architect Sinan, Süleymaniye Mosque, İstanbul.

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Introduction

Since the 21st century, the cultural heritage sector has increasingly embraced immersive technologies, which are “a collective term for augmented reality (AR), virtual reality (VR), and mixed reality (MR), to provide sensory experiences through various combinations of real and digital content” (Bekele et al., 2018). Almost every area of life shows a development towards rethinking and designing for the welfare of individuals, accessibility for all, a sustainable environment and most importantly, a better quality life. This effort becomes more prominent when it comes to the culture, values and tangible and intangible heritage products of a society. Societies exist with their cultural values and differ from other societies. The fact that tangible cultural artifacts cannot be reproduced naturally and that they are faced with the danger of human and nature (Caserta and Russo, 2002) at the same time necessitates the effective implementation of heritage management. There are institutions and organizations that are responsible for transferring these structures to the future without jeopardizing the rights of seeing and using cultural assets in future generations. On the other hand, cultural assets draw an image that has an international demand for visitors and the number of visitors is increasing day by day and is expected to increase in the coming years (Unesco, 2019). Governments have started to include digital targets and investment in their development plans due to their important role in supporting local cultural well-being and economic development, cultural and creative products have become instrumental.

This study aims to develop proposals regarding how Mimar Sinan would innovate in his cultural artifacts, based on the assumption that he lived in the digital age we are currently in. This perspective brings a fresh and imaginative approach to the research, considering how a renowned historical figure would embrace digital advancements and incorporate them into his creations. Architect Sinan, indeed, is one of the most prominent chief architects in Turkish architecture. His books on architecture are still taught as textbooks in universities around the world, demonstrating his enduring influence. Despite centuries passing, the magnificence and structural integrity of the buildings he constructed continue to astonish people. Architect Sinan's legacy stands as a testament to his remarkable skill and enduring impact on the field of architecture. By understanding the historical context and architectural principles that defined Architect Sinan's work, as well as taking into account the preferences and demands of today's visitors, this research aims to propose forward-thinking approaches that provide unique and engaging experiences at cultural heritage sites. Balancing tradition and innovation is key to creating meaningful connections between the past and the present, and this research strives to achieve that goal. Indeed, the authors have taken the perspective of imagining Architect Sinan living in the current digital age and have made an effort to design his works with this viewpoint. By envisioning how Architect Sinan would embrace and incorporate digital advancements in his architectural creations, the authors have sought to explore innovative possibilities and push the boundaries of the visitor experience. This imaginative approach allows for the exploration of new ideas that blend Architect Sinan's architectural legacy with contemporary technologies and concepts, ultimately enhancing the appreciation and engagement of visitors in the digital era. Based on this premise, the aim of the study is to propose recommendations that enrich the visitor experience for cultural heritage sites in the digital age.

1. Cultural Heritage and Digitization

Technology plays a crucial role in enhancing the consumer experience. Governments leverage technology to provide convenient and accessible services, personalized experiences, and innovative solutions. This includes digital platforms, online services, smart systems, and interactive interfaces that enhance the overall consumer experience and satisfaction (Bosene et al., 2021).

These advantages and opportunities arise from national development programs that are encouraged to digitize the sector by utilizing the integration of technology with artistic and

cultural heritage (Vacchio and Bifulco, 2022). For example, in addition to the application of augmented reality (AR) in various fields such as medicine, education, automotive industry, healthcare services, and tourism (Arena et al., 2022) it has been proven to be beneficial for the management and preservation of cultural heritage (CH) as well. The goal here is to enhance, restructure, and explore the visitor experience (Okanovic, 2022), conservation and preservation, to recreate past events (Boboc, 2019) and increase people's awareness of cultural heritage (Wang et al., 2023).

Cultural heritage is a legacy inherited from a previous generation and passed on in tangible or intangible ways. The United Nations Educational, Scientific and Cultural Organization (Unesco) divides heritage into two main categories: tangible and intangible heritage. Tangible heritage refers to physical objects, sites, or structures that have cultural, historical, scientific, or aesthetic significance. It is further divided into natural and cultural heritage. Natural heritage, as defined by UNESCO, refers to natural monuments that consist of physical and biological formations or a combination of both, which hold exceptional universal value from an aesthetic or scientific perspective. Cultural heritage encompasses the tangible aspects of human culture, including historic sites, archaeological sites, buildings, monuments, works of art, and artifacts (Unesco, 2003). The preservation of cultural heritage has been a concern for centuries, and the first laws enacted for its protection emerged in the 15th century. These early laws were primarily aimed at preserving monuments and works of art. However, it was during and after World War II that the need for international cooperation and legal frameworks for the protection of cultural heritage became evident. The extensive destruction and looting of monuments and works of art during the war led to the development of the 1954 UNESCO Convention for the Protection of Cultural Property in the Event of Armed Conflict. Since then, international efforts and legal frameworks for the preservation of cultural heritage have expanded beyond times of war. UNESCO has continued to play a leading role in promoting the safeguarding of cultural heritage through various initiatives, conventions, and programs, including the World Heritage Convention (1972) and the Convention for the Safeguarding of Intangible Cultural Heritage (2003). These international instruments aim to protect and preserve cultural heritage in all its forms, whether tangible or intangible, for future generations (Blake, 2000).

Heritage materials, including artifacts, documents, artworks, and other historical objects, are often conventionally preserved in various institutions such as museums, archives, libraries, and specialized warehouses. These institutions have played a crucial role in protecting and providing public access to these valuable heritage materials for many centuries. The preservation and conservation of heritage materials can be approached through digital preservation (Abduraheem and Sheri, 2022). Digital preservation refers to the process of converting analog or physical information into a digital format using software and hardware technologies. It involves the transformation of traditional or non-digital materials, such as printed documents, photographs, audio recordings, videos, and other analog media, into digital files that can be stored, accessed, and manipulated electronically. Today's visitors are looking for different and innovative applications to enrich and make their experiences meaningful (Correia, Kozak and Ferradeira, 2013; Han, et al., 2019; Özendi, 2022; Öztemiz and Yılmaz, 2017). Developments in the age of information and technology come to the fore in the tourism sector, as in every sector (Carreira, González-Rodríguez and Díaz-Fernández, 2022; Çoban and Akoğlan-Kozak, 2022; Eser, et al., 2019; García-Muiña, et al., 2019). Especially the dijital applications seen in the field of tangible cultural heritage in recent times offer unforgettable and positively experiences to today's visitors (De Paolis et al., 2022; Hajirasoulli, et al., 2021; Mah, et., 2019). Visiting experiences are decisive for tourists to revisit that artifact and recommend it to others (Chung, et al. 2018; Kulakoğlu, 2020; Weng, Fu and Sun, 2021).

Technological advances are driven by the Internet of Things (IT), creating new possibilities for more direct interaction among users, objects and places. These opportunities provide an invaluable innovation for the heritage sector for the digital expansion of museums and heritage sites. For instance, in museums where technology is utilized, physical objects have sensors that

can detect their movements. Thanks to these sensors, objects are able to convey information to visitors, and in doing so, they interact directly with the visitors, making eye contact. This experience enhances the interaction between visitors and cultural objects, providing visitors with a memorable experience. According to a scientific study conducted by Not et al. (2019), the impact of digital-based applications on visitor experience regarding the remnants of World War I was investigated. According to the findings, digital applications have provided opportunities for learning about unnoticed aspects and discovering details that would normally go unnoticed. As a result, positive interaction between the collection objects of World War I and visitors has been achieved. Furthermore, the synergy between physical and digital aspects has promoted empathy and social interaction with the original users of the objects. For example, PLUGGY, a wearable social platform, aims to engage citizens in acquiring knowledge about cultural heritage and fostering heritage consciousness and participation. Indeed, digital platforms can also teach history to students and educate them about the preservation of cultural heritage. By utilizing digital platforms, students can have interactive and immersive learning experiences that promote a deeper understanding and appreciation of cultural heritage. Additionally, specific digital applications such as AR/VR experiences used in museums can entertain children and inspire them while supporting their learning during leisure time.

These applications provide interactive and engaging experiences that not only entertain but also facilitate learning outside of formal educational settings (Wang et al., 2023). There are studies that advocate for the possibility of providing a tourist experience for cultural heritage artifacts through multidisciplinary teamwork. These studies highlight the importance of collaboration among professionals from various disciplines, such as archaeology, history, architecture, tourism, technology, and design, to create comprehensive and immersive experiences for tourists visiting cultural heritage sites. This collaborative approach aims to enhance the overall visitor experience and promote a deeper understanding and appreciation of cultural heritage. These may include computer specialists with knowledge of software and hardware, archaeologists, historians, film art directors, screenwriters specializing in storytelling for cultural heritage, game directors, visual artists, graphic designers, and experts in measuring the tourist experience. The combined efforts of these experts from different fields contribute to creating a holistic and immersive experience for visitors (Olaz et al., 2022). there are also writers who visualize the design process with a graphic. Below, Figure 1 illustrates The Method Steps of Multimedia Development Life Cycle (MDLC).

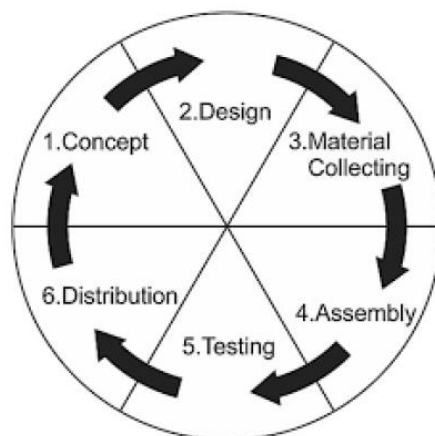


Figure 1. The Method Steps of Multimedia Development Life Cycle (MDLC)

(Source: Sutopo, 2003)

At the conception stage, the purpose of design, user identity, application type, aim and other common aspects should be explained. During the design stage, features should be developed to identify the requirements needed for architecture, appearance, style and application development.

During the material gathering stage, a developer can collect the necessary materials (text, images, audio, video, animation, 3D objects, and other required content or materials) to create the application. The assembly stage is the phase in which the developer creates applications using the content and materials collected during the content gathering phase.

Software tools can be used at this stage. The testing phase is the part where the application is checked to ensure that it functions properly and meets the user's needs. In the distribution stage, which is the last stage, the application must be installed in the storage media for the ready to run. For example, an application in APK format can be installed on an Android operating system-based smartphone. APK (Android Package Kit) is the package format used for distributing and installing applications on Android devices. An application based on AR technology was produced using the MDLC approach (Ahmad et al., 2021). According to this application, when the camera of the users is directed to the Lampung Museum collections, objects are displayed in 3D and information about these objects is provided to the user. The usefulness, convenience, intention and user-friendly perception of the produced application on users were also measured. With a percentage of 83%, the application has proven to be acceptable to users.

2. Materials and Methods

This study is based on a case study within the scope of qualitative research. The selection of Istanbul and Süleymaniye Mosque and Complex as the application area for the study is explained with a few reasons. Indeed, Istanbul is home to a significant number of architectural works by Architect Sinan, who was one of the most renowned Ottoman architects. It is estimated that out of the nearly 400 works attributed to Architect Sinan, more than half of them can be found in Istanbul. This concentration of Architect Sinan's architectural heritage in Istanbul further highlights the city's importance in terms of cultural and historical significance. Istanbul is one of the most visited cultural destinations by tourists in Turkey. The city attracts millions of visitors each year due to its rich historical and cultural heritage, iconic landmarks such as the Hagia Sophia, Topkapi Palace, Blue Mosque, and the vibrant atmosphere it offers. Istanbul has the highest number of cultural artifacts in Turkey. Istanbul is also a city renowned for its rich historical and cultural heritage, boasting numerous museums, palaces, mosques, churches, monuments, and other cultural sites. In addition to that, Istanbul was selected as the European Capital of Culture in 2010. This prestigious designation recognizes the city's significant contribution to the cultural landscape of Europe and highlights its vibrant arts and cultural scene. Süleymaniye Mosque and Complex being an apprentice work of Architect Sinan contributes to increasing its visitability. This helps to alleviate the crowd at other prominent architectural works in Istanbul such as the Sultan Ahmed Mosque (Blue Mosque) and Hagia Sophia, and creates a more balanced tourism movement. By promoting and encouraging visits to Süleymaniye Mosque and Complex, tourists can have the opportunity to explore and appreciate the architectural masterpiece created by Architect Sinan while also spreading out the tourist flow across multiple cultural sites in Istanbul. This approach aims to create a more sustainable and balanced tourism experience in the city. Additionally, the fact that the structure is a külliye and encompasses multifunctional buildings provides options for technological applications.

As a result, the interior of the mosque, the courtyard area (hazire), and the tomb of Architect Sinan have been selected for technological proposals. Based on the preliminary findings, it has been observed that these three spaces allow for the implementation of technology-based elements.

The research followed three stages. In the first stage, the authors of the study utilized written and visual sources related to Architect Sinan to find answers to the research question of what innovations he would have made in his works if he were alive in the present age. They read books about Architect Sinan's life and works, examined his autobiographical account *Tezkiret-ül Bünyan*, in which he conveyed his own expressions to Mustafa Sai Çelebi, and reviewed inventory information of over 200 works attributed to Architect Sinan in Istanbul. On November 23, 2022, the authors watched a 1 hour 47 minutes documentary about Architect Sinan on the digital platform called "Büyük Usta Architect Sinan" (Grand Master Architect Sinan) channel.

Detailed notes were taken during the documentary regarding Architect Sinan's personality and his genius in construction techniques. In addition, articles related to digitalization in cultural heritage sites and impressive tourism experiences were read, and technological innovations used for cultural assets both globally and in Turkey were investigated.

In the second stage, a request letter was written and sent to the Istanbul Provincial Mufti's Office on March 27, 2023, along with the necessary documents, seeking permission for examination and filming at the chosen site of Süleymaniye Mosque and Complex. On March 29, 2023, an official letter granting permission for research and filming, with attention to the necessary considerations both inside and outside Süleymaniye Mosque and Complex, was received. Three separate observation forms were prepared for Süleymaniye Mosque, the cemetery area (Hazire), and the Tomb of Architect Sinan. The observation forms included questions regarding the presence of technological innovations in the observed architectural works, their names, quantities, purposes of use, and their respective locations. The responsible author conducted fieldwork on April 7, 2023, to observe the selected architectural works (Mosque, cemetery area, Tomb of Architect Sinan) on-site, accompanied by the observation forms and research permission letter. The presence of enriching elements of the visitor experience and technological innovations in the works was determined through the observation forms. The findings from the observations were recorded in the observation forms. Observations were made in each structure for approximately 20-25 minutes.

In the third and final stage, on April 19, 2023, the authors organized an online meeting via Zoom to discuss the field data, share and evaluate the on-site observation findings. Utilizing the methods of Brainstorming and Six Thinking Hats Technique, based on the assumption of "What innovations would Architect Sinan make in his works if he were alive today," creative and innovative applications were identified for each architectural work to explore different perspectives. The options obtained were listed, and the final decision was reached through unanimous agreement. For instance, designing a sculpture created by artificial intelligence to welcome, guide, and provide information to visitors of Sinan's mosque, presenting a visualization of Sinan's autobiography in a suitable section of the mosque through a projection or digital reflection. However, due to the sacred nature of the research area being a mosque, great care has been taken in selecting the developed suggestions. Particularly, suggestions related to human depiction have been eliminated from consideration due to their unsuitability for the sacred space. It is stated that all three suggestions developed in the research can be applied to the sacred space and possess appropriate characteristics.

In qualitative research, as in quantitative research, there are criteria established and strategies developed to ensure reliability. One of these criteria is diversity (Eisner, 1991). According to Denzin (2009), diversity involves the use of two or more sources, theories, or methods in the diversity of the data set. A qualitative research approach was adopted during the research and different data development tools such as document analysis and observation forms were used. Diversification related to place, time, and individuals also constitute differences in data (Yılmaz, 2013). In this study, instead of collecting data from a single architectural unit built by Sinan, three different units were addressed, which include the interior of the Süleymaniye Mosque, the cemetery area (Hazire), and the tomb constructed by Mimar Sinan, where evidence and traces are found. Architectural areas that could serve as evidence of Mimar Sinan's material and spiritual cultural continuity have been identified as the research area based on document reviews. Another criterion is the systematic collection of data (Yin, 1994). The data collection process in the research was systematically carried out in three stages. An in-depth research and analysis approach (collection, analysis and evaluation of data) is adopted. The detailed information regarding the validity and reliability of the research is summarized in Table 1 below.

Validity	Internal Validity	Obtaining Official Permission from the Institution Expert Opinion Long-term Interaction Direct Quotation
	External Validity	Explanation of Research Type Description of Research Group Characteristics Specification of Research Group Selection Method Description of Implementation Process of the Study Description of Researchers' Roles Explanation of the Selection Justification for the Used Method Description of Data Collection Tool and Process Explanation of Data Analysis Process Explanation of Validity and Reliability Measures
Reliability	Internal Reliability	Use of Observation Form Use of Multiple Data Collection Techniques Following a Systematic Process Presentation of Findings Without Interpretation
	External Reliability	Adequate Discussion of Data in Results and Discussion Section Checking Consistency Among Data

Table 1. Validity and Reliability Criteria of the Research

3. Study Setting

The authors of the research, while developing recommendations for the architectural works, imagined Architect Sinan living in the digital age and attempted to design his works from this perspective. The metaphor of a compass was used as a tool in the creation of designs, as Sinan, like a compass, had one leg at the center while observing the surroundings carefully to materialize his works. In *Tezkiretül-Bünyan*, Sinan himself expressed that he moved like a compass throughout his life, taking fragments from the places he visited and bringing them back to Istanbul. Sinan transformed motifs from the Islamic religion into magnificent yet simple and elegant artistic elements. Based on this information, technology-based recommendations were developed for the interior of Süleymaniye Mosque, the cemetery area, and the Tomb of Architect Sinan using the method steps of the "Multimedia Development Life Cycle" by Stope (2003). All the developed recommendations are based on the data obtained from the observations.

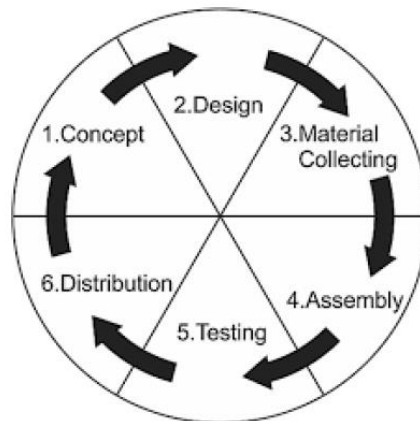


Figure 2. Multimedia Development Life Cycle for Süleymaniye Mosque Interior
(Source: Sutopo, 2003)

1. Concept Phase: It is proposed to create a digital book. A large-sized digital book, measuring 1.5x1 meters, can be designed where visitors can flip the pages by moving their hands in the air.

2. Design Phase: This phase should involve computer engineers, software experts, and history specialists.
3. Material Collection Phase: The information included in the book should be gathered from written and visual materials related to Süleymaniye Mosque and Complex, as well as archival documents.
4. Installation Phase: The designed book can be placed in the last prayer section or the sacred area of the Mosque.



Image 1. Recommended location for the placement of the digital book in Süleymaniye Mosque

5. Testing phase: The testing phase can be conducted at technology centers or innovation hubs.
6. Distribution phase: The distribution phase should be carried out under the supervision of the Istanbul Governorate and the Provincial Directorate of Religious Affairs.

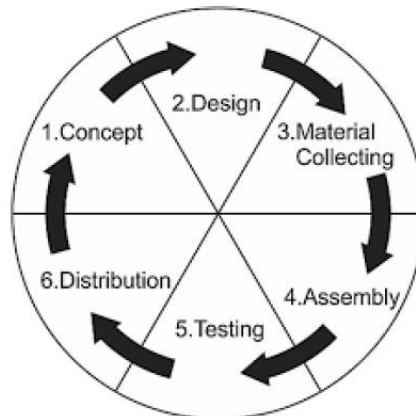


Figure 3. Multimedia Development Life Cycle for the Burial Sites

(Source: Sutopo, 2003)

1. Concept phase: It is suggested to develop a QR code application. A matrix barcode system can be created that contains information about the individuals buried in the cemetery, including important details about their lives.
2. Design phase: Experts in Islamic arts, history, and experts in Ottoman Turkish and Arabic languages should be involved. Web 2.0 tools similar to Canva can be utilized for the design process.
3. Material collection phase: The content should consist of historical records and archival documents related to the Ottoman Empire.
4. Installation phase: The application should be installed within the cemetery area.



Image 2. Recommended Location for the QR Code System in the Burial Site

5. Test stage: Testing should be conducted under the auspices of the Istanbul Governorship Provincial Directorate of Religious Affairs.
6. Distribution stage: Distribution should be carried out under the auspices of the Istanbul Governorship Provincial Directorate of Religious Affairs.

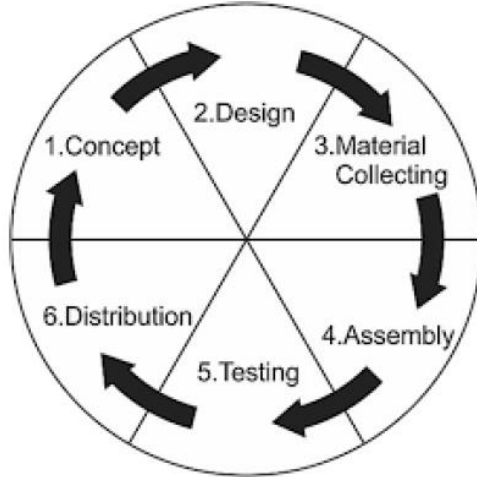


Figure 4. Architect Sinan's Tomb: Multimedia Development Life Cycle

(Source: Sutopo, 2003)

1. Concept Phase: It is proposed to develop a virtual reality application and simulation that narrates Architect Sinan's own life, education, personality traits, his architectural works, the methods and techniques he used in his works, the campaigns he participated in, the works he observed, and his aspirations. The application will also provide audio guidance to direct visitors to his tomb by describing its location.



Image 3. The Tomb of Architect Sinan

2. Design phase: This phase should involve computer engineers, software experts, and history specialists.
3. Material collection phase: It should include books about Architect Sinan's life and works, as well as his autobiographical writings.
4. Installation phase: It can be placed in a suitable location in the outdoor area of the Süleymaniye Mosque.
5. Testing phase: It can be tested in technology centers.
6. Distribution phase: It should be carried out under the auspices of the Istanbul Governorship Provincial Directorate of Religious Affairs.

4. Conclusion

Although centuries have passed since the foundations of cultural heritage were laid in the 15th and 16th centuries, there is still a sustained interest in cultural heritage in the modern era. The balance between preservation and utilization, the enrichment of visitor experiences, and, most importantly, the significance of Tilden's approach to heritage, widely accepted in the literature, continue to endure. According to Tilden, "interpreting heritage is understanding; understanding is accepting; accepting is preserving" (cited in Uzzell, 1998: 12). In addition, Tilden expressed that the importance of heritage should be communicated to visitors with an enriched understanding in the present time. Creatively addressing heritage assets encourages visitors to travel to the past in their own mental spaces and to mentally reconstruct/revitalize their heritage (cited in Nuryanti, 1996). Although Tilden's maxim maintains its essence even after a century, there is a difference at its core: digitization. Nowadays many tourists are searching for distinctive and memorable on-trip experiences, AR is one of the most significant benefits from the standpoint of supply (Rinaldi et al., 2022). With the opportunities and varieties provided by the information age, the transfer of cultural heritage to future generations can be easier and faster. At the same time, the touristic places visited are enriched with innovative applications (Castro, et al., 2018; tom Dieck and Jung, 2017).

Based on the assumption that if Architect Sinan had lived in today's age, he would have made innovations in his works, the research proposes technological innovations, particularly regarding the architectural works of the Great Master Architect Sinan. Drawing on Stope's (2003) "Method Steps of the Multimedia Development Lifecycle," technology-supported steps have been developed for three works. In the development of these steps, the observations of the responsible author were taken into account, and enriching practices were presented with the contributions of the authors.

5. Practical Implications

It is recommended to create a digital book as part of the multimedia development life cycle model for the Süleymaniye Mosque. This digital book, with its large size of 1.5x1 meters, will allow visitors to interact by turning its pages through hand movements in the air. The proposal for this digital book stems from the observation made by the responsible author during visits to the mosque, which revealed that guided groups and visitors who were unfamiliar with the mosque lacked access to important information and often overlooked the existing information boards. The digital book will provide visitors with a comprehensive resource on the importance of the mosque for acquiring knowledge. Additionally, it is expected to capture visitors' interest and enrich their overall visiting experience. This interaction will enable visitors to have an emotional experience, enriching their visiting experience and leaving them with an unforgettable memory. Nowadays many tourists are searching for distinctive and memorable on-trip experiences, AR is one of the most significant benefits from the standpoint of supply (Rinaldi et al., 2022).

It is recommended to implement a QR Code application for the burial area. This proposal involves developing a matrix barcode system that provides information about the individuals buried in the area, including significant details about their lives. The motivation behind this proposal arises from several factors observed in the burial area. The inscriptions on the tombstones are often in Arabic or Ottoman script, making it challenging for visitors to understand their significance. Additionally, there is a lack of information boards indicating the identities of the graves, resulting in limited engagement with this area by visitors. Furthermore, tourists often use the burial area as a resting and sitting spot rather than appreciating its historical significance. By introducing a QR Code application, visitors can easily access information about the graves using their smartphones. This application can also include an audio feature to cater to visually impaired individuals. The aim is to transform the burial area into a remarkable place that provides insights into the lives of influential figures from Ottoman history and facilitates an engaging and meaningful visiting experience for all visitors.

It is recommended to create a virtual reality application that simulates Architect Sinan and his tomb, utilizing the multimedia development life cycle model. The motivation behind this proposal stems from the author's observations regarding the lack of signs or guidance indicating the location of Architect Sinan's tomb, which has resulted in limited awareness and visits by a small number of people. Considering that Architect Sinan is a remarkable figure in world history, renowned for his exceptional talent and architectural works that are widely taught, it is important to provide meaningful visits to his tomb. By implementing a virtual reality application, tourists can have an immersive experience that not only enhances their visits but also fosters knowledge and awareness among individuals. This proposal aims to create a conscious and enlightened perspective towards Architect Sinan's legacy, elevating the significance of his tomb as a valuable cultural site. In this regard, it is recommended to develop a virtual reality application called "Architect Sinan's Simulation" that narrates Architect Sinan's life, education, personality traits, his architectural works, the methods and techniques he employed, the expeditions he took part in, the works he observed, and information about his dreams. The application should also provide a description of the location of his tomb and guide visitors who wish to visit it. By using virtual reality technology, visitors can immerse themselves in an interactive experience that brings Architect Sinan's world to life and allows them to explore his architectural achievements in a unique and engaging way. This application would contribute to the preservation and promotion of Architect Sinan's cultural heritage, while enriching the visitor experience. According to research, architectural structures redesigned and enriched with virtual reality and augmented reality provide visitors with unforgettable experiences (Kunt, 2023; Rinaldi et al., 2022).

6. Theoretical Implications

What sets this study apart and makes it unique is its design based on the assumption of how Architect Sinan, if he were alive in the current digital age, would innovate in his assets. This

perspective brings a fresh and imaginative approach to the research, considering how a renowned historical figure would embrace digital advancements and incorporate them into his creations. This research holds original value and contributes to the literature by developing digital recommendations for sacred areas. It is thought that the experiences of visitors to sacred places should be enriched with technology-based applications. In this respect, the research explains with concrete examples that digital applications can be applied to sacred places.

This research develops technology-based recommendations for architectural works built by Sinan and provides a practical roadmap using Sutopo's (2003) multimedia lifecycle steps. Nowadays, ease of use and more accessible and effective access to architectural works are provided through digital tools. In this regard, it is recommended that technological transformation be achieved by applying Sutopo's (2003) steps to suitable or feasible architectural works and testing them with the technology acceptance model.

7. Discussion

By embracing technological advancements and integrating them into the preservation and presentation of cultural heritage, a more immersive and enriching experience can be created for visitors, ensuring the continued relevance and appreciation of these historical treasures.

It is hoped that the suggestions outlined above will be thoroughly reviewed by experts and given priority under the supervision of the Istanbul Governorship Provincial Directorate of Religious Affairs. If deemed suitable, these suggestions should be implemented with the necessary budget and equipment, taking into consideration the concept of smart cities and the digitalization of cultural artifacts in the present era.

The technology acceptance model can be used to determine the success of suggestions regarding Sinan's works. The Technology Acceptance Model (TAM) developed by Davis (1989) is a model that suggests the acceptance of a new technology by users depends on two variables: perceived usefulness and perceived ease of use. TAM has provided guidance to ideas suggesting that the success of information systems, in technological terms, depends not only on technical and managerial features but also on the personal characteristics, expectations, and perceptions of system users. It has also shed light on how user perceptions on various issues can influence this success. Utilizing this model, the impact of perceived ease of use and perceived usefulness on the visitor experience should be measured concerning the developed technological element. Only through this method can the success of technological innovations be determined.

Of the three proposed suggestions, two are designed to emotionally contribute to visitors' experiences. For example, it is envisioned that visitors will provide an emotional and interactive expression while flipping through the pages of a large-sized book designed with augmented reality for the interior of the mosque. Similarly, the AI-supported speaking image of Mimar Sinan will also provide visitors with an emotional experience. It is expressed in the literature that emotional experiences also provide unforgettable experiences (Rinaldi et al., 2022). The QR code system for the cemetery area will enable visitors to have detailed information about those in the cemetery area. Information such as who the people buried there are and when they lived is not provided to visitors in its current state. In this regard, developing an application will provide visitors with rich information. The authors have endeavored to think like Mimar Sinan in today's digital age and have developed suggestions. It is strongly recommended that these suggestions be reviewed by experts in the field of artificial intelligence and that necessary permissions be obtained for their implementation in a sacred place.

8. Limitations

The most significant limitation is that the research area is sacred areas (Süleymaniye Mosque, the cemetery area (hazire), and the tomb of Architect Sinan). This situation is interpreted as the biggest obstacle in developing suggestions. Due to the sacred nature of the research area being a

mosque, great care has been taken in selecting the developed suggestions. Particularly, suggestions related to human depiction have been eliminated from consideration due to their unsuitability for the sacred space. It is stated that all three suggestions developed in the research can be applied to the sacred space and possess appropriate characteristics.

To truly think like Mimar Sinan, artificial intelligence-based software should be developed. From this perspective, this research could be interpreted as an attempt by the authors to emulate the thinking of Mimar Sinan.

Another limitation of the research is the lack of visual support for the interface or implementation of the recommended technologies. This topic falls outside the expertise of the research authors. At this point, it is strongly recommended to involve experts in software and artificial intelligence fields.

The final limitation is that the developed recommendations are only applicable to three works (Süleymaniye Mosque, the cemetery area (hazire), and the tomb of Architect Sinan) and were created by following the multimedia life steps of Sutopo (2003).

9. Suggestions

Especially for sacred sites, tools within the realm of information and communication technologies can be utilized. These tools include laser scanning, three-dimensional (3D) point clouds, digital photogrammetry techniques, 3D geometric feature technology, augmented reality (AR), virtual reality (VR), mixed reality (MR), virtual tours, asset cataloging, blockchain technology, and Geographic Information Systems (GIS).

Depending on the nature of the sacred site and the application, one or more of these tools can be selected. For example, the relief-adorned walls of sacred sites can be revitalized using VR and AR technologies to recreate their original grandeur and colors. Panels, calligraphy, or plant motifs found within sacred sites can be made more interactive using digital photogrammetry techniques.

Visitors' expectations regarding the digital tools they desire to encounter in sacred areas can be measured. Additionally, visitor satisfaction regarding existing works enriched with digital tools can be examined.

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Conflict declaration

The authors of the article declare that there is no conflict of interest.

Author contributions

The first author of the article contributed to the theoretical framework, manuscript review, and English translation (%50), the corresponding author contributed to the original draft and methodology (%25). Likewise, the third author also contributed to the original draft and method (25%).

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