

# **The Video Guides at the Musei Civici in Rome: An Example of Technological Innovation in Touristic Cultural Heritage Experiences**

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**Abstract.** In recent years, the cultural sector has been going through an intense period of development, in which new considerations on different and fresh ways of displaying and narrating objects and events from the past are intertwined with suggestions from studies on culture, tourism and ICT. The use of new technologies for the enjoyment of cultural experiences becomes important when it is necessary to follow co-creation principles, especially when allied to the added value perceived by users in cultural environments. These are based on diverse and potentially increasing levels of interaction between technological tools and the transmission of cultural knowledge to tourists. Video guides represent a reliable tool that can assist a museum visit, making it more cognitively and physically enjoyable. The project described in this paper has been created by ETT S.p.A. in collaboration with various experts. This new interactive video guide aspires to a revival of an experience through the curiosity and emotional engagement of users, achieved with an indoor location system – based on Beacon (BLE) technology – that automatically suggests content to visitors that is associated with nearby artwork. Augmented and Virtual Reality also support the delivery of information content via storytelling techniques.

**Keywords:** Cultural Heritage, ICT, Interactive Video Guides, Tourism Experience.

## **The relationship between tourism and cultural experiences**

In an increasingly multicultural world, with its cognitive overloads, the concepts of identity, tradition and memory are closely connected to the desire to travel and discover things in order to create or expand cultural identity and memory. The knowledge of personal and foreign cultural identities has become a driving force when promoting tourism, a fundamental aspect in the processes of creating personal well-being and raising the level of quality of life as perceived by individuals. Starting from these assumptions, the need to understand how the research of knowledge must be substantiated and how cultural discipline and research can make a “dialogical” contribution to the fulfilment of this objective is outlined. Protection and enhancement have a common aspect: knowledge. How do you value and protect what is unknown? How do you enhance without innovation? In order to increase public enjoyment and knowledge of cultural heritage, the role of new technologies becomes fundamental and positive, as it is capable of modernising the current condition of cultural sites and museums, making them accessible to a wider and more assorted public.

The modern institution best-suited to host these technologies is a museum: it is open to innovation and can actively contribute to the development of the thinking and culture of modern society, making it more dynamic and engaging by increasing tourism. In

contemporary multicultural societies, museums are renewing their relationship with visitors to become centres of cultural expansion for the development of a new widespread culture. This new culture concept relies on the evolution of the concept of a tourism experience based on the exchange of knowledge aimed at the creation of understanding between diverse cultures.

The idea of a “tourism experience” has its roots in the concept of the experience economy, which states that the creation of experiences is necessary and fundamental for every type of business operating in all economic sectors, since the simple offer of products and services is increasingly perceived as replicable and interchangeable.

Even though experiences are argued to be subjective, intangible, continuous, and highly personal phenomena [1], the word ‘experience’ can refer to two different states: the moment-by-moment lived experience and the valued experience, which is subject to reflection and prescribed meaning [2]. This kind of experience is defined as happening within the person who is engaged in an event, on an emotional, physical, spiritual, or intellectual level [3], creating memorable and lasting impressions on the people who live them. In the last few decades, the idea that companies, and in a wider perspective, institutions operating in the tourism and culture sectors, should offer unique and memorable experiences has become imperative.

In the academic field, various definitions of a tourism experience have been developed over some time and the majority of them tend to describe it as a complex psychological process. The act of tourism unifies complex experiences, memories, and emotions relating to places [4]. Focusing on on-site experiences, a tourism experience can also be defined as an interaction between tourists and destinations, with destinations being the site of the experience and tourists being the actors of the experience. Other authors argue that a tourism experience should also be related to any past travel-related event which was significant enough to be stored in our long-term memory. A wider perspective points out that experiences involve more than tourists. Tourism industries also take part in the generation of cultural presentations.

Overall, the various definitions of a tourism experience include a contrived and created act of consumption, a response to problems with ‘ordinary’ life, a search for authenticity, and multifaceted leisure activity.

Although the importance of the experience is undisputed, it is necessary to analyse two broad changes that have shaken the theoretical and practical analysis of how the experiences, and the value associated with them, are created. The original concept of an experience has been redefined by the growing desire of travellers to play an active role in the co-creation of culture-related experiences. This happens because tourism and culture, sectors in which services are dominant in the experience-creation equation, greatly benefit from the cognitive and emotional involvement of the tourist, in terms of satisfaction derived from the experience of travel, memory and positive word-of-mouth testimony on the destination or cultural site.

This process of involvement is closely and positively linked to the use of new technologies, capable of simplifying and making the experiences of transmission and assimilation of knowledge more enjoyable, due to their high and intense capacity of conveying information. The implementation of technological systems creates new

knowledge diffusion templates, capable of crafting levers of culture, tourism, identity and creativity to produce new cultural wealth for the benefit of all people.

The concepts that have been analysed so far relate to some of the main trends in defining the concept of a tourism experience today. A tourism experience is the prerequisite of the journey that defines the level of appreciation of everything that happens to the tourist during a trip, in terms of fun and relations with other cultures and lifestyles.

A tourism experience is therefore aimed principally at learning. By definition, the journey represents the unification of the world through the transformation of its resources into knowledge.

These new concepts of a tourism experience supported by technology expose possible exchanges among culture, art and technology, paving the way towards improving the relationships that already exist between these worlds.

The project presented in this paper can demonstrate a concrete, meaningful, and ambitious contribution to the evolution of tourist awareness patterns in a museum environment, able to manage the complexity of enhancing and improving the use of technology in cultural heritage.

The Civic Museums of the City of Rome, Italy – Musei Capitolini, Museo dell’Ara Pacis and Mercati di Traiano-Museo dei Fori Imperiali – have been equipped with a highly innovative video guide created by ETT S.p.A, which combines the characteristics of a traditional audio guide with innovative technologies, thereby creating a “multimedia tour”.

The description of the artwork preserved in the three museums is aided by the wise use of storytelling combined with modern technologies of augmented reality (AR) and virtual reality (VR). The innovative video guide is a versatile and dynamic tool allowing visitors to enjoy museum environments in a completely original way. An indoor location system, based on Bluetooth BLE technology, is able to detect the visitor’s mobile device position, create a direct interaction with it and suggest, almost like magic, content related to nearby points of interest (POIs), without spoiling the location’s visual appeal.

In this way, tourists who may not be accustomed to visiting museums or using technology can easily find informative content and find their way around museums, even very large ones.

Another main aspect of the tourism experience is temporal variability. If the duration of the stay is important to describe, quantify and qualify the tourism experience, it is indisputable that the tourist is psychologically stimulated long before the journey actually begins, as well as after it.

In fact, anticipating and preparing the journey, then documenting it in real-time, is a way of producing an expectation [5] of a tourism experience, since media and mediations build our interpretations and practices, to the extent that they sometimes even originate them [6]. They also represent a preview experience of the destination itself.

Afterwards, recalling memories of the journey and sharing them with family and friends is a cognitive, emotional and social need and is, in itself, an experience.

## **Museums as cultural conveyors**

Tourist engagement and the development of a new global culture in the field of cultural heritage enhancement takes place above all in museums; places traditionally associated with the preservation of artefacts testifying to past cultures, where it is possible to enjoy beauty and acquire knowledge.

ICOM, the International Council of Museum, defines a museum as “a permanent, non-profit institution serving society and its development, open to the public, which has the objective of acquiring, preserving, researching, communicating and displaying for the purposes of study, education and pleasure, the material testimonies of humanity and the environment” [7].

This definition truly embodies the evolution that museums have faced over the years. They integrate new knowledge, create a new relationship with the public and embrace new systems of use, increasingly supported by technological tools and storytelling techniques. The modern museum system is the result of profound changes. Development and diffusion of new technologies, new forms of cultural tourism and new forms of entertainment characterise the renewal that is still happening in culture.

Museums are no longer plain exhibition places and unfeeling containers of objects, but they play a growingly important social role, both in culture and tourism. Over the years, following a request from ever more demanding users, museums have become real engines of a new culture. From places where artistic masterpieces and artefacts were kept distant from the public, museums have become places of learning, through the creation of new experiences that aim to be more and more emotional; helped by the use of cutting-edge technology and storytelling techniques.

Cultural fulfilment is typified by two distinct but complementary areas: the exhibition object, which presupposes knowledge of museum architecture; and the narration, which presupposes a profound knowledge of the artist, of the work of art or of the territory that is being shown. These are consequently linked to the transmission of this knowledge. These two aspects profoundly influence the relationship between the physical container and cultural content and, thanks to the use of ICT, evolve in an increasingly participatory sense. Through interaction, users become the fulcrum that links these two themes together.

New technologies applied to historical heritage can play a fundamental and positive role in improving the quality of the experience. They increase public enhancement of cultural heritage, as well as the level of psychological and social satisfaction deriving from the visit, and modernise the cultural offer. A museum is, therefore, a modern institution, open to innovation and capable of actively contributing to the development of thought and culture in contemporary society.

In today's society, digital technology has changed the way visitors interact with museum institutions. Users try to investigate the exhibited content as much as possible, continuously seeking information and using web platforms, such as forums, blogs and social networks. They are well-informed and able to recognise the reliability of information circulating on the web. Tourists, before visiting a museum, wonder about what they will experience and develop greater expectations than in the past. It is up to cultural operators to create wider and more articulated proposals to satisfy tourists' thirst for knowledge and pleasure.

Museums are moving away from traditional tools, even though captions, information panels and group guides are still in use, to digital and technological tools such as touch screens, interactive paths, mobile applications, virtual tours and interactive installations. The revolution has also involved those traditional instruments linked to museum visits, audio guides, which provided recorded audio content. These have evolved into increasingly innovative devices such as video guides, tools that allow the reproduction of visual content such as images and videos, also combining augmented reality (AR) and virtual reality (VR) experiences on various types of devices like smartphones and tablets [8].

From simple actions like using a touch screen or listening to a conference, to complex involvement in a workshop or a theatrical event staged within the exhibition space, we are witnessing a growing articulation of visitor multiform experience when using the “machine museum” [9].

Technology contributes to the safeguarding of cultural identity in places, the dissemination of culture and the production of new cultural offerings. It can be an important driver supporting competitive growth and the development of innovative and profitable business models, with the advantage of spreading cultural and artistic knowledge more easily, without causing harm to the original artefacts and architecture [10]. The digitalisation of cultural content and their virtual use allows anyone, at any time and place and with extreme ease, to encounter cultural heritage that is preserved in cultural institutes around the world. From a socio-cultural point of view, this helps the recovery and easier transmission of the cultural identity of countries and populations to future generations while, at the same time, promoting the knowledge of other cultures. The challenge that museums face is to make access to content increasingly simple, natural and complete in terms of quality and quantity of information for all types of user.

Although the presence of technology is fundamental if this goal is to be reached, it needs to be discreet so that users can focus on interacting with content rather than on the technological tools. The way forward is to create digital devices that are capable of meeting the needs of museum visitors by adapting technology to people; not the other way round.

This aspect can be related to the concept of **presence**, a cognitive construct believed to be strictly related to **immersion** and connected to involvement and interest in learning [11]. While immersion is an effect of technology, presence is a psychological, perceptual and cognitive consequence of immersion, the psychological perception of “being in” the mediated environment that the user is immersed in [12]. Immersion in virtually enriched environments is related to the substitution of real sensorial stimuli with synthetic ones. The wider the range of perceptions and the higher the extent to which a real sensation is replaced by a synthetic one, the more immersed a user will feel. A virtually enriched environment is defined as vivid when the technology succeeds in creating a realistic and sensory rich environment [13]. The creation of virtually conveyed environments in Cultural Heritage needs to reproduce a historically accurate and credible world, where visitors can experience a genuine sense of being there. Inducing a genuine sense of presence requires a sensory rich digital environment that provides an immersive experience that is appealing for users to explore. Another crucial aspect in Cultural Heritage learning experience is in fact motivation, linked to engagement and, post-experience, to the concept of perception, determined by a combination of automatic processes that begin with properties of the stimuli, individualistic processes that depend on a person’s past experiences, knowledge, and expectations.

The new video guide of the Civic Museums of Rome is, therefore, an innovative tool aiming at breaking down barriers that may arise between visitors and their enjoyment of a cultural experience in a touristic environment that is none other than the city itself. From this point of view, the contribution of technologies adds benefits to a simple touristic visit, enriching it with new interactive and multimedia experiences. The importance of creating a multimedia tool that uses storytelling and narrative to excite and spark curiosity is that the tourist is no longer an accidental museum visitor but a participant in what is going on.

### **Technology meets cultural storytelling**

The starting concept was that “although we had already tried to put the common visitor in the forefront since the 1920s, this was done [...] without all the paraphernalia intended to discover the desires of visitors. The difference lies in the reference to a broader and new ethos in public services which is clearly summarised by the phrase “the customer is always right”. Museums, although not exactly working to the principle that customers are always wrong, have in the past tended to operate with a more paternalistic ethos [...] the public was conceived as a child who needed to be educated and raised appropriately. To make an analogy with school, it was more like that way of teaching in which the teacher stands in front of the class and imparts notions, rather than the so-called child-centred pedagogical approach, in which children are encouraged to organise their own time and to follow their lines of research” [14].

Considering the progressive hybridisation and multidimensionality of cultural participation, it is clear that the audience-centred approach is now fundamental to the realignment of cultural institutions with their audiences, overcoming the traditional transmission of knowledge linked to top-down logic and favouring horizontality of the process of creating cultural value. Stimulating imagination by the use of storytelling techniques during a visit is the key to emotional engagement. Continuously updated creativity creates the starting point leading to an experience that is enriching and satisfying.

Culture has become accessible to a wider variety of audiences, thanks to the use of technology that makes complex content easier to communicate by increasing the level of interaction and involvement and creating new experiences that can enrich the psychophysical well-being of the user.

The modern culture-seeking tourist requires more freedom in the exhibition itinerary, a need that some museums have listened to by getting rid of fixed narrative paths and freeing the visit from a pre-established order of the exhibits. A further consequence of the introduction of technology in the cultural sector is how visit-time is managed. Visits can be organised directly by the user, with customised tours of a predefined duration. As well as this, technologies have expanded the visit-time to both before and after the actual visit. Some tools allow the planning of itineraries online, by selecting the cultural sites and museums to be visited in advance and to renew and deepen the experience after it has ended.

One of the tools capable of making the visit even more complete is the use of storytelling techniques, capable of transmitting and enhancing even complex cultural content. Narration techniques have developed in parallel to the history of human culture and turn out to be the privileged communicative form both for the dissemination of the tradition and cultural identity of a people and for the creation and sharing of a system of values, symbols and ideas that will be left as a testimony to posterity. History, therefore, defined as a succession of events, is a set of narratives communicated through primordial forms of dissemination: from the great hunting trips of rock engravings to the adventures of mythical heroes praised and set to music by Greek bards, from religious poems to antique cosmogonies, in which the origins of the universe are theorised. After that, even with the birth of more articulated thought, including philosophy, we continue to favour the narrative form as an explanatory tool, as can be seen in Platonic myths. In later times, thanks to the development of new communication media, such as the press, cinema, radio, TV and the Internet, stories have been enriched with other meanings, values and symbols. Nowadays smartphones and other mobile devices have become the favoured tools through which the

technique of digital storytelling is implemented, and in which the story is accompanied by 3D reconstructions, augmented reality (AR) and virtual reality (VR) experiences. It appears clear that the use of technologies in the Cultural Heritage sector requires more than mere realism, it needs historical accuracy. All aspects of content, including storytelling, must be supervised by domain experts, who guarantee the validity of reconstructions and contents. Storytelling needs to be supported by realism, achieved by adding virtual replicas of real artefacts and even entire geographical areas [15].

### **Interactive video guides**

The museums that benefit from the new interactive video guides – Musei Capitolini, Museo dell'Ara Pacis and Mercati di Traiano-Museo dei Fori Imperiali – are part of the Roma Capitale museum system, which consists of an extremely diversified set of museums and archaeological sites of great cultural value.

The Musei Capitolini complex is distinguished in that it is considered to be the world's oldest public museum. It is Rome's most important civic museum and was opened to the public in 1734 when Clement XII was Pope. In 1471, Pope Sixtus IV donated to the Roman people some bronze statues previously kept in the Lateran Palace (the world-famous She-wolf, the Spinario, the Camillo and the colossal head of Constantine, with the globe and the hand). These were initially installed on the external façade and in the courtyard of the Palazzo dei Conservatori. The oldest exhibits were added to over the following centuries and they were joined by successive finds from urban excavations closely linked to the history of ancient Rome. They may now be seen in Palazzo dei Conservatori, Palazzo Nuovo and the Pinacoteca Capitolina.

The so-called "Mercati di Traiano" (Trajan's Market) is a unique archaeological complex and is perhaps one of its kind anywhere in the world. This unusual architectural work has followed the city's evolution from the Imperial age until today. It has been constantly reused and transformed and is part of the history of Rome. Since 2007, the Mercati di Traiano area has hosted the Museo dei Fori Imperiali, dedicated to the architecture and sculpture of the Imperial Forums, with its layout highlighting the ancient volumes and functions of the building. In the museum, ancient monuments are reconstructed, giving an idea of the original spaces and their functions. Today, the museum exhibits some architectural reconstructions of the Forum of Caesar, the Forum of Augustus, the Forum of Nerva, the Templum Pacis and the Forum of Trajan.

The Museo dell'Ara Pacis, designed by Richard Meier and inaugurated in 2006, houses the Ara Pacis Augustae, the altar dedicated by the emperor Augustus in 9 BC to the Roman Pax, a divinity and symbol of peace and prosperity of the Augustan age. On the new multimedia tour, emotional and lively storytelling informs tourists about the Capitoline Museum collections. They also learn about the original location of pieces coming from the Imperial Forums and understand the meaning of the friezes decorating the Ara Pacis.

The multimedia device uses sustainable technologies, with low environmental impact, based on BLE-Beacon technology that provides support for simple and immediate use. The indoor locating system, consisting of small Bluetooth signal repeaters – called Beacons – are almost invisible and are easy to install.

They have no impact on museum environments and exhibited works of art are not overshadowed by technology. BLE Beacons have been installed in these three

museums, all near points of interest (POI). This means that visitors no longer have to enter a number on an audio guide, nor do they have to frame a QR code for in-depth information. Content associated with a nearby POI is automatically triggered and shown on the video guide. The choice of using BLE-Beacon Technology is related to the concept of **presence** as “the perception of non-mediation” [16], a psychological state in which the person’s subjective experience is driven by some form of media technology with little awareness of the manner in which technology shapes this **perception** [17]. Bluetooth technology interacts in an “invisible” way with the video guide and makes it possible to guide visitors through museum environments, without diverting their attention from the beauty of the surroundings, even if the user still perceives a sense of being physically located in a mediated space.

This solution allows to maintain a profound sense of immersion in the surroundings, letting visitors to focus about the exploring and learning experience, avoiding the cognitive load deriving from having to autonomously orientate in the museum spaces. The visit experience is now less traditional, where visitors stand and watch, but increasingly encourages active, even if facilitated, participation.

In order to create the best possible use in terms of tourism, visitors are offered a choice of itineraries, created and organised to respect their available time and/or whichever specific cultural aspects they wish to learn more about.

For each museum, an extended and complete itinerary has been designed to include the most important artworks kept in that museum complex. Other available itineraries explore specific themes, such as the protagonists of the ancient world and the human and divine vicissitudes of legend and myth, the architecture of the Imperial Forums or the hidden meanings of the Ara Pacis bas-reliefs.

In order to create a cultural and leisure network within the city of Rome’s museum circuit, with all the touristic and cultural experiences that this offers, the video guide has a specific sector on current exhibitions. This section is constantly updated to increase public involvement in what is on locally so that people may see cultural activities that might not otherwise be discovered.

The video guide presents innovative augmented reality content that integrates information on an individual POI in a new and immediate way. For example, by framing the artwork with the device camera, the virtual environment of augmented reality can make further levels of information visible, such as in-depth videos, historical photos, reconstructions or textual information. The video guide augmented reality POIs have four ways of activating AR experiences: the discovery mode, through explorable, in-depth features that give text information and facts on details of the works; the narrative/animation/AR planar mode, for some paintings, the audio narrative follows the AR animation that reveals details of the work; pure recognition, recognition of the work activates related content; an AR logo, by pointing with the device camera at the easily recognisable AR logo associated with the multimedia tour, visitors can activate videos relating to some of the museum collection exhibits and get additional information and content.

In the new video guides, the use of augmented reality aims to lead to a deeper perception of the exhibited works, also connected to a greater awareness of the original shapes and volumes of the Roman world, by creating a cultural environment in which users are not simply instructed, but become active learners by feeling integral part in the experience. The use of reconstructions in augmented reality does not only show the physical context of the artifact and its surroundings, but also provides a vivid sense of its overall cultural background and the society that produced it. Within the applications of augmented reality and 3D reconstructions in Cultural Heritage, it can be beneficial for the visitors to perform a virtual restoration of the artwork, either because the real counterpart is damaged, or due to missing pieces,



which may be missing or held in different collections. Indeed, virtual reconstructions of artefacts and environments can be used to communicate Cultural Heritage to a wider public, allowing it to experience the past as a form of learning in non-formal and informal contexts.

For example, the videoguide uses augmented reality to show how the remains now housed in the Courtyard of the Palazzo dei Conservatori of the Musei Capitolini once formed Colossus of Constantine, a huge acrolithic statue of the late Roman emperor Constantine the Great that once occupied the west apse of the Basilica of Maxentius near the Forum Romanum in Rome. By the size of the remaining pieces, it is believed that the seated, enthroned figure would have been about 12 meters high. The use of augmented reality and 3D reconstructions allows visitors to visualize the size and the volumes of the statue in its original position and lets them perceive and actively engage with the cultural content, learning about tangible and intangible elements.

Furthermore, to guarantee accessibility for users with hearing impairments, the video guide also has adapted and simplified texts for the hearing impaired who would otherwise be unable to enjoy the informative content of the video guide. This aspect embodies the prospect of inclusion of all social categories.

Another innovative aspect of the new video guide, regarding the seeking of information before the journey and recalling emotional memories after it, is the chance that the user is given to enjoy appealing and informative content before and even after the actual visit, also by using virtual reality (VR). Virtual reconstructions can also concern real, existing locations of architectural and artistic value and can help users to remotely appreciate and learn about that site, or even motivate them to engage in a real experience [18].

The video guide application can be used on tablets provided by the three museums but can also be downloaded onto personal mobile devices before the visit. The three museums can be explored through exclusive 360-degree virtual reality content, accessible from the “panoramic” section of the application. Panoramic photos provide new and suggestive perspectives and points of exploration of museum spaces. This ploy can also have a promotional role, anticipating the visit and creating desire and curiosity, but it is also useful following the actual visit, becoming an unusual and innovative travel souvenir.

This solution diversifies a classic museum visit, creates a high level of curiosity in the visitor, promotes learning and supports the recalling and sharing of emotional memories.

The entire project reflects the aim of creating a technological and sustainable model representing a tool able to assist a visit to a museum by highlighting the collections of each museum and their specific characteristics. Visitors can no longer be considered passive users; they are active and free to choose their tour itinerary or personalise it based on their interests, needs and time availability.

## **Conclusions**

The diffusion of ICT in the tourism approach to culture has been bi-directional: it has allowed the transformation of a cultural institution through the acquisition of new tools for the enhancement and administration of heritage, but it has also permitted a change in the ways that visits are experienced. This has led to the redefinition of the “tourist - cultural heritage” relationship. Technological innovation is an essential opportunity for the diffusion of culture and knowledge. In this new perspective, the cultural sphere assumes relevance and importance not only for the conservation and protection of artworks but also concerning the creation of a global and heritage-aware

travelling community. New parameters for the diffusion and fruition of knowledge are being explored and it is therefore clear that engaging cultural experiences are exponentially linked to the use of new technologies and the evolution of the concept of a tourism experience. The video guide designed for three of the Musei Civici in Rome – Musei Capitolini, Museo dell’Ara Pacis and Mercati di Traiano-Museo dei Fori Imperiali – is, therefore, a visiting tool able to revive the tourist experience, sharpen curiosity and enhance knowledge. Among the aspects that can be most appreciated in the project is the sustainability of the BLE Beacon system that has no impact on museum spaces and aesthetics. The innovative and easy to use video guide, and the storytelling that involves users in the narrated stories, allowing them to identify and memorise abstract and complex concepts, is also well-liked. Added to this, the use of augmented reality (AR) and virtual reality (VR) have further enriched the visitor experience within the three museums. This instrument can make visitors feel fully involved and they become active; no longer a passive part of a museum experience. This follows the idea that “antiquity is not given to us all by itself - it is not there to hand; on the contrary, it is up to us to know how to draw it out” [19]. New technologies and storytelling techniques must always aim at the creation of engaging and rich tourism experiences in Cultural Heritage.

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