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Evolution of Archaeological Site Narratives in China

Zhao na

Executive Curator,Jinsha Site Museum
fduzhaona@163.com

Abstract

In China, the presentation of archaeological sites began with spontaneous on-site exhibitions organized by archaeologists, evolving over time into structured archaeological site museums. Over the past 70 years, the narrative of archaeological site displays in China has undergone exploration, development, and transformation. The initial stage (1953-1978) focused on site protection with a narrative colored by specific political ideologies. Its objective was to propagate Marxist ideology, elucidate social developmental laws, and objectively depict the evolution of human society. The second stage (1979-2004) saw simultaneous excavation and display, emphasizing interpretation and showcasing the historical and cultural significance of sites. The third stage (2005 to the present) introduced archaeological site parks as a novel display model, marking two narrative shifts. Firstly, there was an emphasis on public engagement and societal representation. Secondly, it adopted a holistic approach, considering both the site and its surroundings, thereby evolving into a "three-in-one" presentation system comprising "site display + museum display + site landscape display". Today, archaeological site parks have emerged as new public cultural spaces where site presentation no longer entails one-way value transmission but fosters a two-way communication process, satisfying public historical memory and emotional resonance.

Keywords: Site Narratives, Archaeological Site Park, Presentation System, China

Introduction

Over the past century, China has made significant advances in archaeology, with major discoveries consistently emerging. As a result, archaeological site museums—established based on these discoveries—have become a prominent category within Chinese museums. Although incomplete statistics indicate that the number of such museums in China has surpassed 120, accounting for approximately 2% of the total , research on these institutions has developed concurrently with their growth. Over the past seven decades, scholars have extensively examined topics such as the definition, characteristics, exhibition categories, display methods, and audience engagement of archaeological site museums. Nevertheless, systematic studies on the narrative evolution of Chinese archaeological sites remain limited.

The narrative surrounding Chinese archaeological sites not only flourishes within the context of Chinese cultural traditions but is also shaped by the global evolution of museological and cultural heritage ideas. This interplay has given rise to the distinctive "archaeological site park" model. These sites play a crucial role in promoting the collective protection of archaeological sites, offering accessible and intuitive educational resources, and facilitating the widespread sharing of site protection outcomes.

Conservation-led Display of Sites (1953-1978)

This period was marked by the establishment of the Zhoukoudian Exhibition Hall in 1953 and the Xi'an Banpo Museum in 1958. The Zhoukoudian Exhibition Hall represented a departure from previous practices, setting a precedent for establishing on-site museums to showcase excavations. The opening of the Xi'an Banpo Museum in 1958 further solidified this approach by presenting the site as a permanent exhibition. Notably, this marked the first time an archaeological site was presented to the public as a contemporary museum.

The "site-hall and exhibition-hall" format became a standard during this period, with a clear emphasis on-site presentation as the central feature. Exhibition halls assumed secondary roles, primarily focused on the conservation and display of movable cultural artifacts.

On-site Display

During this period, archaeological sites were displayed in their original state. For instance, the Dingling Museum opened the tomb chamber directly to the public. The Xi'an Banpo Museum constructed a large structure on the site itself, which has been described by Japanese scholars as epoch-making（Fig.1). In terms of presentation and interpretation, the Banpo Museum employed comprehensive display techniques with an

emphasis on explanatory content, facilitating an intuitive understanding of the site's specific significance. In the corridors housing key relics, explanatory signs were used to clarify the artifacts, while each independent relic unit provided the audience with a more detailed understanding of the site.

Fig.1 The permanent exhibition of Banpo Site

Exhibition Hall Display

In this type of exhibition, the focus remained on the basic arrangement and organization of artifacts, with the initial incorporation of supplementary techniques such as figure restoration and models, exemplified by the "Banpo Girl"(Fig.2) display at the Banpo Museum. However, the primary approach continued to prioritize the straightforward presentation of objects, rather than offering a comprehensive dissemination of information.

Fig.2 The "Banpo Girl" display at the Banpo Museum

Concept 1: The Display Concept is Dominated by a Specific Political Hue

The Zhoukoudian Exhibition Hall and the Banpo Museum were established with official state endorsement. Their creation was pivotal in affirming Marxism's ideological role, uncovering social development patterns, and emphasizing human significance in societal progress. These principles have since become central to the display concepts at archaeological sites. For example, the exhibits at Zhoukoudian in the 1960s focused on themes such as "Human Evolution," "Labor's Role in Human Development," and China's paleoanthropological advances after 1949[1]. However, this politically charged approach risks diminishing the uniqueness of the exhibits, rendering them more akin to general museum presentations rather than site-specific displays.

Concept 2: The Dichotomy Between On-site Display and Museum Exhibition

Although the "on-site display & museum exhibition" model was established early on, it can be inferred from the relevant discourse that, according to the prevailing values of the time, immovable archaeological sites and movable cultural relics in museums were regarded as distinct. During this period, the role of museums as instruments of patriotic education took precedence over their function in conveying information about the sites, thereby contributing to a division between the content displayed at the site itself and that shown in the museum.

Concept 3: Preservation Research Takes Precedence, with Display Lagging Behind

The prevailing value orientation prioritizing preservation significantly influences the construction of archaeological site museums, with exhibition design typically scheduled only after the site's high value has been recognized through excavation and research. Preservation remains the primary goal at the outset of construction. This approach generates the maximum amount of research data from archaeological excavations, but it also results in the irreversible fragmentation of the site, leaving only a disjointed array of excavated units with limited space for exhibition once the excavation concludes.

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[1] Liu,Y.J.(2016).*Study on the Development of Museum Display and Exhibition in Chinese Site museums*. Xi'an: Northwestern University,pp.12.

- **Comprehensive display from on-site to surroundings (1979-2004)**

As archaeological efforts advanced alongside the development of infrastructure, a series of significant discoveries and excavations emerged. This period saw the proliferation of archaeological site museums, with their scope expanding to include not only tomb and settlement sites but also city sites and museums dedicated to ancient science and technology site museums.

Simultaneously, the presentation of archaeological site parks became more diversified. In 1987, the Yin Ruins Museum in Anyang, Henan, was established, integrating the ruins with modern landscaping to extend traditional exhibition methods into the open-air environment. In 1988, the Yuanmingyuan Site Park was inaugurated, marking the establishment of China's first archaeological site park.

On-site Display

Preservation displays evolved beyond protective sheds and open-air exhibits to focus on informational descriptions, leading to the 'layered contrast' exhibition model. At the No. 3 Pit of Emperor Qinshihuang's mausoleum site museum, half of the artifacts were restored, while the other half remained in their freshly excavated state. This method allowed visitors to experience the pre-, during-, and post-excavation stages, conveying historical and archaeological insights. Other museums soon adopted this approach. The Yinxu Museum reconstructed the Shang dynasty halls and Fu Hao's tomb(Fig.3), while the Dabaotai Western Han Tomb Museum combined restoration with excavation to preserve site authenticity and recreate the tomb's original appearance.

Fig.3 The restoration of Fu Hao's tomb

Regarding the display content, this phase emphasized the excavation and presentation of site-related information. In addition to identification displays, the No. 3 Pit Hall at the Emperor Qinshihuang's Mausoleum site Museum utilized light boxes around the walls to present information about the architecture, pottery figurines, weapons, and other artifacts in distinct sections.

Museum Exhibition

During this period, museum displays shifted from general education to deeper analysis of site culture and the popularization of archaeological research. The Zhoukoudian Exhibition Hall was renovated to highlight the cultural significance of the site, focusing on early hominid life. Display methods included sculptures, paintings, photographs, reproductions, and multimedia. For example, the Xinle Site Museum used models to show the function of a spinning wheel. Interactive elements, such as the Banpo Museum's reproduction of stone axes and human-face fish basins, allowed visitors to engage directly with the exhibits[2].

Shen,Z.R.(1998). Forty years review of Banpo Museum Exhibition. *Prehistoric Studies*,pp.449-453[2]

Extended Display

During this phase, the concept of site display evolved beyond the traditional museum setting, extending into outdoor environments and adopting a park-like presentation. In 1987, the Yinxu Museum was established, emphasizing site reconstruction in combination with garden art and cultural landscapes, thereby integrating large-scale archaeological sites with landscape design. In May 1994, the Banpo Village reconstruction was completed, allowing visitors to experience a recreated Banpo village and the daily life of its inhabitants. Visitors could also engage in activities such as fishing, pottery-making, and archery. These innovations laid the foundation for the development of archaeological site parks.

Concept 1: Enhancing the Display Initiative During Excavation

In this phase, there was a noticeable increase in the initiative of archaeological work aimed at the display of archaeological sites. Some institutions and archaeologists began to plan for the protection and exhibition of sites at the outset or during the excavation process. In certain cases, excavation was only initiated after the construction of protective structures and exhibition halls. For example, the excavation of the No. 2 Pit at the Qin Shihuang Terracotta Warriors and Horses site only began after a protective exhibition hall was established. This period also saw the creation of a new "excavate and exhibit" model, bringing the often-mysterious process of archaeological excavation to the forefront. This approach allowed audiences to engage more closely with the archaeological work and contributed to the popularization of archaeological knowledge.

Concept 2: Exhibition Shift Toward the Historical and Cultural Significance of Sites

In contrast to the previous phase, which focused primarily on ideological propaganda, this period saw a shift toward the dissemination of cultural and historical narratives tied to the site itself. For instance, the Yaozhou Kiln Museum in Tongchuan was organized around five key systems: the history of Yaozhou kiln production, an interactive demonstration area, a research section, an antique production workshop, and an ancient site showcase. Each of these elements contributed to a deeper understanding of the its cultural and historical significance.

The hierarchical transmission of information directly from the site, changes in the content of museum exhibits, and the addition of auxiliary materials alongside restoration displays were significant efforts aimed at enhancing audience comprehension of the site's historical and cultural value. However, this shift in the approach to information dissemination, while notable, appeared to be more of an attempt at formal innovation rather than one based on systematic scientific analysis.

Concept 3: The Emergence of the Park Model Prototype

With the onset of the 1980s, the integration of Western site presentation methods with tourism and cultural industries led to a growing recognition of the economic value of heritage sites, both academically and in practice. This period witnessed the emergence of a park-like exhibition model, which significantly expanded the concept of site display. A notable example of this trend was the construction of the Yin Ruins Museum in 1987, which successfully integrated the ancient ruins with modern garden design. The subsequent establishment of the Yuanmingyuan Site Park in 1988 marked the first archaeological site park in China. The shift towards the park of heritage sites during this period reflects a broader societal transition in site presentation, from a focus on the dissemination of knowledge and patriotic education to a greater emphasis on meeting public entertainment needs.

- **Universal Sharing of Protection and Utilization of Archaeological Sites (2005-present)**

The year 2005 marked a turning point in Chinese museum history, coinciding with the centenary of modern museums in China. A key development was the introduction of *the Measures for the Management of Special Funds for the Protection of Great Heritage Relics*, issued by the Ministry of Finance and the State Administration of Cultural Heritage. This policy shift changed heritage conservation practices. The State Administration of Cultural Heritage later implemented the 11th through 14th Five-Year Plans, guiding local efforts in archaeological research, relic protection, and the creation of archaeological site parks for advanced site conservation.

On-Site Display

During this phase, on-site displays evolved to embrace a more holistic interpretive approach. A notable example of this shift is the renovation of the Banpo Museum, which restructured the site into seven thematic units: "Prologue," "Home," "Ritual," "Construction," "Pottery," "Funeral," and "Pursuit." This reorganization aimed to present a comprehensive narrative of the Banpo people's world. Additionally, the integration of multimedia and 3D animations enhanced the interpretive experience, allowing for a multifaceted understanding of the site（Fig.4）.

Fig.4 Digital display of Haihunhou Tomb

In this context, the priority in on-site display shifted toward ensuring the safety and stability of the sites themselves. Consequently, the presentation of site remains is largely static, with common methods including in situ display, exhibition hall protection, signage, backfilling for protection, and restoration displays. These strategies ensure that the integrity of the site is maintained while providing meaningful interpretation for visitors.

Table 1. List of on-site display modes

On-site display modes	**The case**
Original state display	 Zhoukoudian National Archaeological Site Park
Protection hall display	 Jinsha National Archaeological Site Park

Sign display	 Panlongcheng National Archaeological Site Park
Backfilling protection display	 Erlitou National Archaeological Site Park
Restoration Display	 Suitang Luoyang City National Archeological Site Park

Museum Exhibition

The rapid growth of the museum sector has elevated the role of displays in archaeological site exhibitions, with museum construction often prioritized alongside site preservation. Influenced by evolving exhibition concepts, many displays now adopt thematic storytelling approaches, using diverse media to convey socio-cultural narratives and historical contexts. Exhibitions are organized around themes that explore a site's social, historical, technological, and artistic significance.

Modern museums have expanded both in space and content, with renovated and newly constructed museums increasing display areas. For example, the Yinxu National Archaeological Site Park's museum will feature six halls dedicated to different aspects of the Shang Dynasty. Some museums, such as the Science Popularization Experience Hall at Zhoukoudian(Fig.5), incorporate interactive experiences to enhance visitor engagement and education. These developments aim to offer comprehensive narratives about archaeological sites and artifacts, with digital multimedia helping to enrich learning through participatory and immersive methods.

Fig.5 Science Popularization Experience Hall at Zhoukoudian

Site Landscape Display

Archaeological site parks have become a key model for preserving and utilizing archaeological heritage. These parks go beyond traditional displays by incorporating distinctive site landscapes that enhance the presentation of findings. Site landscapes, which include both natural and cultural elements, embody the cultural essence of the site. Natural landscapes reflect the environment of the era, while cultural landscapes highlight significant aspects of the site through thematic or narrative interpretations. For example, the Daming Palace National Archaeological Site Park features sculptures and miniature models that capture the Tang Dynasty's cultural essence. Similarly, the Hemudu Site recreates scenes of life from 7,000 years ago. The Jinsha National Archaeological Site Park integrates landscapes like the "Jade Path" and the "Jinsha Deer Garden" to provide visitors with a deeper understanding of ancient Shu civilization and its ecological environment(Fig.6).

Fig.6 "Jade Path" Landscape of Jinsha National Archaeological Site Park

Concept 1: Attention to the Presentation and Utilization of Sites

During this phase, the presentation of archaeological site parks evolved from an introspective focus within the discipline to a broader national strategy, marking a significant shift. The "14th Five-Year Plan" outlines two primary objectives: "enhancing the level of presentation and utilization of Great Heritage Relics" and

"promoting the high-quality development of national archaeological site parks."[3] Specific practices, such as the increase in the number of archaeological site parks and museums, the expansion of exhibition areas, and the diversification of display methods, all point to a heightened attention to the presentation and utilization of sites, reflecting a new level of development.

Concept 2: Shifting to Interpretation

Major societal changes have consistently influenced the evolution of museum philosophies. In the 1960s, the rise of the civil rights movement infused museums with a more populist tendency. The global economic crisis in the late 1970s and subsequent public funding cuts in the 1980s forced museums to seek self-sufficiency and societal support. By the 1990s, postmodern influences led to a widespread crisis and reflection within the humanities, including the museum sector[4]. This shift resulted in a move from an object-centered to a people-centered approach, recognizing that audiences were no longer passive recipients of knowledge. Exhibitions had to adapt, transitioning from mere dissemination to active interpretation. This transformation also impacted site displays, leading to a focus on narrative and informational exhibition practices. Curators began to organize exhibits around thematic frameworks, using archaeology as the core, and conducting multi-level, multi-angle, and multi-disciplinary interpretations of the relics. This approach connected the artifacts to specific historical and cultural contexts, imbuing them with situational relevance and storytelling.

Concept 3: Establishment of the Trinity Presentation System

The concept of site presentation within archaeological site parks has evolved and expanded significantly. The **"Xi'an Declaration"** in 2005 emphasized the integration of archaeological sites with their surrounding environments, while the **"Liangzhu Consensus"** and **"Luoyang Declaration"** in 2009 reinforced the role of government leadership in site protection and park construction. The introduction of the **"National Archaeological Site Park Management Measures"**[5] established a new model for large-scale site protection, focusing on the site and its environment as a public space for research, education, and recreation, with national exemplary significance.

In this context, the entire park is conceptualized as an exhibition space, with site landscapes integrated into the presentation. These landscapes become essential components, accurately conveying the cultural essence of the site. Together with museum exhibitions and on-site displays, they form a comprehensive and multifaceted presentation system within the park. This system enables visitors to engage with cultural heritage while also enjoying a recreational experience.

• Conclusion and Recommendations

Over the past 70 years, China's archaeological site narratives have transformed significantly. From informal meetings to the establishment of museums and site parks, a tripartite display system—on-site displays, museum exhibitions, and landscape displays—has developed. Influenced by national policies and fields like archaeology museology, and heritage conservation, two key shifts are evident: a holistic approach integrating the site, artifacts, and environment, and a shift toward interpretive narratives that foster two-way communication rather than one-way value transmission. These changes enhance both public historical memory and emotional connections to sites. Based on this evolution, recommendations are made to further improve archaeological site museums and parks.

1. Strengthening Interdisciplinary Collaboration

To further enrich the narrative and interpretative dimensions of archaeological site exhibitions, it is essential to foster deeper collaboration between archaeologists, museologists, cultural heritage experts, urban planners, and technology specialists. This interdisciplinary approach will ensure that exhibitions are not only scientifically rigorous but also engaging, innovative, and responsive to public interests. Collaborative efforts should also emphasize the integration of new technologies, like virtual reality (VR) or interactive digital displays to improve visitor experiences.

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[3]The State Administration of Cultural Heritage.(2021,October 12). Notice on the Issuance of the '14th Five-Year Plan for the Protection and Utilization of Major Heritage Sites'.Retrieved November 11,2024， from https://www.gov.cn/zhengce/zhengceku/2021-11/19/content_5651816.htm.

[4] Yin, K.(2018).Reinventing and Transforming the Museum:A General Overview of Contemporary Ideas of the Museum. *Southeast Culture*,(264)4:82.

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2. Emphasizing Sustainability and Site Preservation
Continue focusing on the long-term preservation of archaeological sites. Future plans should include strategies to protect sites from environmental damage and reduce the impact of tourism. It's important to balance visitor access with conservation efforts.

3. Expanding Public Engagement and Education
As the role of archaeological site museums and parks increasingly shifts towards interpretation, more efforts should be directed at engaging the public in active learning. This includes developing educational programs for various audiences, and interactive and participatory exhibits should be expanded to allow visitors to "dig" into archaeological processes, simulate artifact restoration, or contribute to ongoing research through citizen science initiatives. Additionally, developing outreach programs that bring archaeological knowledge to underserved communities.

4. Integrating Cultural and Natural Landscape Features
As seen in examples like the Jinsha Site and the Daming Palace Site, the fusion of physical site restoration with landscape architecture offers visitors a more complete and immersive experience of historical settings. Future archaeological site parks should continue to explore creative ways of blending natural and cultural elements, using landscape features to enhance the storytelling of the site's historical and cultural significance.

5. Adapting to Emerging Global Trends
Given the global interest in heritage conservation, Chinese archaeological site museums and parks should consider international collaboration and adaptation of best practices from around the world. Participating in global dialogues and adopting internationally recognized standards for conservation, accessibility, and exhibition design will improve the global standing of Chinese archaeological heritage. Additionally, adapting to emerging trends in eco-tourism and cultural tourism will allow Chinese archaeological sites to appeal to broader audiences and attract sustainable tourism.

6. Enhancing Accessibility and Inclusivity
It is critical that archaeological site museums and parks make their exhibitions more accessible to a diverse range of audiences. This includes providing multilingual signage and guides for international visitors, as well as ensuring physical accessibility for individuals with disabilities. Additionally, special programs should be developed for marginalized or underserved groups to ensure equitable access to the educational and cultural opportunities these sites provide. Making heritage sites more inclusive will help foster a deeper connection to the past and promote cultural awareness.

7. Long-Term Research and Continuous Evaluation
Long-term research should assess how different presentation methods impact visitors' understanding and appreciation of archaeological sites, focusing on engagement, knowledge retention, and emotional responses. This research will guide improvements in exhibition practices and refine the overall narrative. Regular feedback through visitor surveys and consultations with academic and local communities will ensure displays remain relevant and dynamic.

As China's archaeological site museums and parks evolve, these recommendations aim to promote an integrated, sustainable, and public-oriented approach to heritage presentation. By preserving archaeological treasures and making them accessible, China can safeguard its cultural heritage while fostering global appreciation of shared human history.

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TRAVELLING BACK TO THE FUTURE: MUSEUMS AS TIME MACHINES

Ayça Bayrak Uluğ

Dokuz Eylül University, Museology PhD Candidate
aycabayrak@gmail.com

- **Abstract**

The analogy of museums functioning as time machines is pervasive in museological discourse. Despite the frequent use of this metaphor, the theoretical underpinnings of how museums facilitate temporal navigation and the nature of these experiences remain underexamined. Conventionally, time is perceived as a linear continuum encompassing the past, present, and future. Museums are predominantly viewed as vessels that transport audiences to the past. However, this dominant narrative requires critical reevaluation to include broader and more nuanced temporal representations. There is a need for a critical museological perspective that scrutinizes the implicit and explicit temporal constructs within museum exhibitions. The key question is whether museums can go beyond their traditional role of preserving history to also help us think about the future. Can museums create experiences that take us not only to the past but also to potential pasts and futures? Developing such dual temporal experiences within museums could significantly enhance their role in shaping public understanding of both history and future possibilities.

Keywords: ***Time Machines***

• Introduction: Researching the Meanings Beyond a Metaphor

Have you ever traveled in time? Or seen a time machine? Perhaps you have—if you've visited a museum. The metaphor of the museum as a "time machine" is both popular and evocative, likening visits to museum halls to journeys across different historical eras. Yet, despite its frequent use, the theoretical underpinnings of this metaphor remain underexamined. The concept of time is so intrinsic and embedded to the modern museum experience; it has been rarely questioned. The commonly held notion that museums primarily "travel" to the past time needed to be assessed critically as it limits our understanding of how museums display and interpret time in peculiar ways which can be called museum temporality. This paper thus seeks to analyze the relationship between the time machine and museum temporality in tandem with the direction of time travel in order to contribute the critical museum studies.

As cognitive linguists George Lakoff and Mark Johnson illustrate in their book *The Metaphors We Live By*, the metaphors are more than just a linguistic device; they serve as a certain way of seeing and practicing (1980:4-7). Lakoff and Johnson assert that most fundamental concepts such as life, time, discussion etc. are metaphorically structured. In other words, metaphors are shaping not only the language but also the conceptual frameworks which are central to human understanding and reveal invisible connections between seemingly disparate things. Because of that, metaphors are not merely analogies; they are intuitive methods that open new avenues for research, allowing us to explore the unknown by relating it to the known or vice versa.

• Time Travel, Time Machines, and the Modern Museum

To better understand the concept of the museum as a time machine that traditionally travels to the past, it is essential to first explore the historical context in which the ideas of time travel and time machines emerged, especially as themes in science fiction. Literary historian Franco Moretti emphasizes how literary works mirror and influence the ideologies and values of their societies. In his *Signs taken for wonders: On the sociology of literary forms (1983)*, Moretti highlights how literature reflects social, political, and cultural developments. Building on this idea, we can explore time travel as a theme shaped by the sociocultural forces of the 19th century. In other words, situating time travel within a broader historical framework is crucial to understanding the sociocultural context that gave rise to this early theme in science fiction and its enduring popularity.

The long 19th century period starts in the second half 18th century and ends with the first world war. This roughly 164-year period between 1750 and 1914 is a period of great transition and change which is marked a pivotal shift in the modernization processes. The revolutions in England and France had a profound influence, particularly in Europe, and played a significant role in shaping the contemporary world. This era, marked by accelerating mechanization, industrialization, and urbanization in Western societies, saw social classes become more defined through industrialization, an increasing emphasis on science, numerous technological and scientific discoveries, and the expansion of global trade,

fueled by advances in transportation, communication, colonialism, and imperialism. Additionally, the emergence of nation-states during this period led to it being known as the "Age of Empires."

The so-called Long 19th Century witnessed profound transformations in the understanding of various concepts, driven by the aforementioned changes. Notably, the latter half of the 19th century stands out for the emergence of groundbreaking theories about time. One of the most distinctive features of these theories was the idea that time and past events do not simply vanish but rather exist in a different realm from what we call the present. This perspective led to the conceptualization of time as a "fourth dimension," comparable to the three spatial dimensions, thus sparking debates about the spatial nature of time. John Bigelow explains, "*Treating time as a 'fourth dimension' in this way opens up the possibility of imagining time travel fictions. Under these new theories of time, the thought can arise that—since we can imagine being a Venetian listening to Marco Polo recount his adventures in distant China—so too should it be possible to imagine, say, Scrooge McDuck leaving 20th-century America, traveling to Ancient Egypt for a visit, and then returning to share his experiences here and now*" (2013, p.152). In short, this view of time as a fourth dimension made time travel imaginable, igniting the imagination of many writers. Consequently, from the late 19th century onward, time travel narratives became increasingly common, giving rise to a distinct genre of time travel within science fiction.

Andrea L. Bell and Yolanda Molina Gavilán argue that the concept of time travel in literature predates the invention of the time machine itself. In their exploration of time travel narratives and their "prehistory," they trace the origins of this genre back to earlier traditions involving imaginary journeys to unknown or fantastical realms (2012, p.xii). While fictional journeys to distant or imaginary realms can be found as far back as Ancient Greek literature, the first story explicitly referring to time travel is thought to be *Lumen*, written by French astronomer Camille Flammarion and published in 1875. However, it was not until the latter half of the 19th century that time travel began to be portrayed as a technological phenomenon rather than as something facilitated by divine intervention or chance. However, by the late 19th century, as the increasing mechanization of daily life became more evident, fiction began to feature devices or machines explicitly designed for time travel. "*Time travel feels like an ancient tradition, rooted in old mythologies, old as gods and dragons. It isn't. Though the ancients imagined immortality and rebirth and lands of the dead, time machines were beyond their ken. Time travel is a fantasy of the modern era*" (Gleick, 2016, pp. 7-8). This perspective underscores that, while timeless themes like immortality and the afterlife have ancient roots, the concept of traveling through time via a machine is distinctly modern phenomenon.

The period's intellectual landscape, shaped by Auguste Comte's positivist philosophy and Charles Darwin's theory of evolution in *On the Origin of Species* (1859), laid the groundwork for a modern understanding of historical progress. This influence wasn't limited to science; it spurred the emergence of human sciences like sociology, anthropology, and archaeology, which began to systematically interpret human history. This intellectual evolution also coincided with significant technological advancements, establishing a framework in which the passage of time and human development could be understood scientifically. These shifts set the stage for the concept of time as a dimension to be studied and experienced, influencing how museums and exhibitions—such as the Expositions universelles—began presenting historical artifacts to engage the public in a form of temporal exploration.

The concept of time machines can be better understood by examining early classics of science fiction literature (Kutach, 2013, p. 30). When we think of the time machine, British author H.G. Wells often comes to mind, as he is regarded as one of the pioneers of the science fiction genre. However, it is noteworthy that Spanish diplomat and playwright Enrique Gaspar created *El Anacronópete* in 1887, one of the earliest known examples of a machine specifically designed for time travel—roughly eight years before Wells' famous work. While H.G. Wells' *The Time Machine* (1895) played a central role in popularizing the time travel genre, it also, as Bigelow notes, ignited a rapid surge in the genre's popularity, spreading like wildfire (2013, p.153). In this context, Edith Nesbit's *The Story of the Amulet* (1906) dedicated to the curator of Egyptian and Assyrian Antiquities at the British Museum Sir E. A. Wallis Budge, stands out as a seminal work that inspired by both time travels and archeaology, which is described by James Gleick as "*time travel catalyzed by archaeology*" (2016, p.167) and it includes scenes set in a museum, particularly the British Museum as a portal, which are instrumental in understanding this metaphor. Notably, the British Museum later hosted an exhibition titled *Time Machine* in 1994, curated by James Putnam. The aim of this exhibition was to show that artifacts from Ancient Egypt are not merely static relics of the past. By juxtaposing these ancient artifacts with works by contemporary sculptors, Putnam sought to demonstrate the potential for complex connections between historical objects and the present. This exploration continued in 1995 with *Time Machine 2*, an exhibition at the Museo Egizio in Turin, Italy. Here, Putnam expanded on the concept of time travel within the museum setting, encouraging visitors to consider how historical artifacts might transcend their temporal origins to engage with contemporary culture.

The concept of museums as "time machines" has evolved over centuries, with notable theoretical and practical contributions from the 19th century to the present. As mentioned, the origins of this metaphor can be traced to the 19th century, but its popularization accelerated particularly in the 20th century, with new museum practices that transformed the visitor experience and shifted focus onto the audience. In museological literature, Jay Anderson's *Time Machines: The World of Living History* (1984) is one of the earliest works to evaluate museums as time machines. Similarly, Robert Lumley's The Museum Time Machine: Putting Cultures on Display (1988) addresses how museums function as vehicles

for representing and interpreting cultures. Lumley examines how cultural artifacts are selected, organized, and displayed to construct narratives about history, identity, and society, emphasizing the role of the audience in the meaning-making process shaped by visitors' perspectives. A more recent example would be the 2016 book *The Archaeology of Time Travel: Experiencing the Past in the 21st Century*, which explores the concept of time travel in archaeology, focusing on how people experience the past through various forms of interpretation and engagement in the 21st century.

The analogy of museums as time machines has gained prominence, also leading to a variety of examples that explore this metaphor in practical fields of the museum. A recent instance is found in the Netherlands at the Discovery Museum, where a daily event centers on the theme of "time travel." Digital tools have also been applied to enhance the experience of time travel within museums. For example, the Städel Museum in Frankfurt, Germany, has employed 3D reconstruction techniques based on historical visuals from 1816, 1833, and 1876 to recreate its exhibition halls. The Helsinki City Museum introduced a Time Machine exhibition in 2019, commemorating the 150th anniversary of Finnish photographer Signe Brander (1869–1942), combining Brander's historical photographs with virtual reality technology. Similarly, the Metropolitan Museum of Art in the United States developed an online digital time machine for children. More recently, the Ludwig Museum in Hungary has hosted an exhibition titled Time Machine, curated by Krisztina Szipőcs, running from September 1, 2020, to January 5, 2025. This exhibition presents works from the museum's collection that reflect contemporary interpretations of the time machine metaphor; each artwork is designed to function as a "time machine," inviting viewers to embark on a cognitive journey, according to the exhibition's educational booklet. Examples are numerous. Collectively, these examples demonstrate that the metaphor of museums as time machines remains relevant. They illustrate how modern museology continues to shape innovative approaches to exhibiting time, artifacts, and knowledge.

- ## Modern Museum: A heterochronic time machine

French thinker Michel Foucault's seminal works *Discipline and Punish* (1977) and *The Birth of the Clinic* (1973) were instrumental in developing institutional critiques that examined institutions like hospitals and prisons through the lens of power, knowledge, and authority. Foucault's impact on museum theory emerged with the application of his philosophical approach and concepts to museums. This paper employs his heterotopology approach to establish a theoretical foundation for an archaeology of time in museum which is critical to understanding the "museum as time machine" metaphor in a peculiar way.

Heterotopia, a neologism derived from the Greek words hetero (meaning "other" or "different") and topos ("place"), was introduced by Foucault in his 1967 lecture *Des espaces autres* (Of Other Spaces). Foucault conceptualize heterotopias through six principles and the fourth principle of heterotopias centers on their connection to "slices in time," or what he terms *heterochronies*. In modern societies, heterotopias and heterochronies are complexly structured. One prominent example of this are spaces that accumulate time indefinitely, such as museums and libraries. Unlike in the 17th century, when collections reflected individual preferences, the modern museum and library represent a collective effort to gather and archive "all times, all epochs, all forms" into a single, timeless space. This modern notion of preserving and containing time in an "immobile place" exemplifies the unique role that museums play in 19th century Western culture as heterotopias, creating an endless accumulation of time detached from the passage of conventional time and this peculiar type of time can be named as museum temporality.

As historian François Hartog states "*the museum has always been a powerful temporal agent for Western civilization*" (2020, p. 2). It appears that time is uniquely constructed within modern public museums. More specifically, museum temporality has evolved in close connection with historicity, shaping how museums present and interpret time. This relationship influences both the narrative frameworks used to display artifacts and the ways in which audiences engage with the past, highligting the museum's role as a dynamic mediator of temporal experience. In other words, it is a byproduct of the 19th-century practices that shaped the modern public museum as we know it today. After the French Revolution, the Palais du Louvre was transformed into a museum, making formerly private collections—previously assembled according to the preferences of religious and political leaders, aristocrats, and later the bourgeoisie—accessible to the public. This transformation introduced the concept of a shared national heritage and historical past, laying the foundation for what is now recognized as the modern public museum (Schubert, p. 18; Macdonald, 2006, p. 86; Huyssen, p. 13; Duncan, 1995, p. 22) and museum temporality.

In the national project, modernity and conservatism coexist in a paradoxical yet complementary manner. On the one hand, the rapid pace of progress brought by the Industrial Revolution spurred interest in preserving the material past and inspired new ways to conceptualize the "uses of the past." Confronted with monumental technological advancements, visitors sought reassurance in the permanence of certain elements. As Sharon Macdonald notes, this was a "*rescue attempt to save what would otherwise vanish in what was now increasingly perceived as swiftly coursing, transient time*" (2006, p. 88). Similarly, Andreas Huyssen remarks that "*In Lübbe's theory, the museum compensates for this loss of stability*" (1995, p. 26). The rise of nationalist movements following the French Revolution enhanced historical awareness, leading to an increase in research and excavations aimed at uncovering the ancient past, and giving rise to disciplines such as art history and archaeology. Tony Bennett refers to these as "exhibitionary disciplines" (1995, p. 75), emphasizing the interwoven relationships between exhibitions, scientific inquiry, and knowledge construction. During this time, national

museums became prevalent as sites for historical narrative, emphasizing the study of the past to understand the present. National museums showcase nationalism and progression through their collections, and chronological and taxonomic methods became dominant in exhibitions (Guerrieri, 2002; Schubert, p. 24)

Universal Exhibitions illustrates modernity-conservatism paradox quite well. For instance, 1878 Paris Universal Exposition's theme was new technologies at the same time in this exposition the concept of retrospective exhibits emerged, leading to the creation of spaces designed to recreate the past. Living rooms were displayed as living spaces filled with period objects, artifacts, and even people to offer a holistic representation of the culture at a specific moment. As citated by Stoklund de Jong and Skougaard explain, "*It was arranged in such a way that it was not only possible to look into the living room but also to step into it, which gave a strong personal feeling of visiting a past world*" (1993). This approach also influenced the development of folk and open-air museums across various European countries (Stoklund, 1994). A notable example of this preservationist approach is seen in the work of Swedish teacher Artur Hazelius, who feared that the Industrial Revolution was threatening Scandinavia's unique ways of life. Determined to preserve the furniture, tools, costumes, buildings, and artwork of earlier times, he opened Skansen in 1891—the first open-air museum—which was envisioned as a "kaleidoscope time machine", enabling travel through both time and space.

It is important to note that the time machine was a prominent theme in 19th-century science fiction, with literary works often reflecting the social, political, and cultural developments of their time. In Enrique Gaspar's novel The Time Ship named as *El anacronópete*, the protagonist, Dr. Don Sindulfo, unveils his time-traveling invention at the 1878 Paris Universal Exposition. The story begins with setting off to showcase *El Anacronópete* at the 1878 Paris Universal Exposition. This exhibition's theme, "New Technologies," promised to "*satisfy basic curiosities and display technical advancements in science and industry*" (Gaspar, 2012, p.15). Known exhibits at the 1878 Paris Universal Exposition included Alexander Graham Bell's telephone, Edison's phonograph, and Émile Reynaud's praxinoscope, regarded as a precursor to cinema. Given the impact of technological advancements like the telephone and cinema in shaping new ways of thinking about and experiencing time and space in Western culture (Kern, 2003), it is hardly surprising that Gaspar, about nine years after the 1878 exhibition, imagined a time-traveling machine and chose to set it within the Universal Exhibition in Paris. In this context, the name Gaspar chose for his time machine is noteworthy. *El Anacronópete*, a neologism, combines three Greek terms: *'ana,*' meaning 'to go back'; *'cronos*,' meaning 'time'; and *'petes*,' meaning 'flying' (Bell & Gavilán, 2012, p. xi).

The metaphor of the museum as a time machine, rooted in the 19th century mentalité, positions museums primarily as keepers of the past. This metaphor emerged during a time of heightened historical awareness, when museums were seen as tools for consolidating national identities and heritage, anchoring them firmly in a retrospective role. Although the concept of a time machine suggests movement through both past and future, the 19th-century context limited its application to a backward journey—reflecting a cultural tendency to memorialize rather than to envision forward.

In this framework, museums became 'immobile places' that preserved and accumulated time, embodying the unique role of heterotopias in 19th century Western culture. However, as spaces of both history and knowledge, museums are also capable of inspiring future-oriented thought. By curating artifacts that highlight past achievements, technological advances, and societal shifts, museums encourage visitors to reflect on how these narratives might evolve. This dual function—of safeguarding the past while prompting reflection on future possibilities—positions museums as dynamic temporal spaces. Rather than serving as static repositories, they engage visitors in a continuum where the past informs an ongoing dialogue about the future.

• Conclusion: Travelling Back to the Future

The museum-time machine metaphor, though rooted in the 19th century—a period often described as both the "Age of Empires" and the "Age of Museums" due to the rise of nation-states and the proliferation of museums in Western societies—captures the era's dual focus on historical preservation and national identity. This metaphor illuminates the unique temporal character of museums as places where time, like space, is curated, contextualized, and made accessible. Modern museums are not only spaces that display objects but also dynamic, contested arenas where social relationships and historical perspectives are both shaped and reflected. Time in modern museums represents a distinctive temporal dimension where time is encapsulated, curated, and exhibited as past time or history.

Museums collect, preserve, and interpret artifacts from the past, creating narratives that serve as bridges to history. As Theodor Adorno states, "*Museums arose not from necessity, but out of respect for history*" (1981, p. 186). So that modern museums are not just heterochronic time machines but also retrospective. Modern museums as retrospective heterochronic time machines producing historicity is resonance with 19th centuries obsession of history as Foucault states and this obsession is traditionally inherited by contemporary museums.

We can ask different questions inspired by Agamben's statement, "*Every culture is first and foremost a particular experience of time, and no new culture is possible without an alteration in this experience. The original task of a genuine*

revolution, therefore, is never merely to 'change the world', but also – and above all – to 'change time'" (1993,91). Making archaeology of museum temporality by analyzing roots of museum time machine metaphor encourages us to question whether museums can balance their commitment to preserving the past with a vision oriented toward the future. It also invites a reexamination of fundamental museological questions and the societal roles museums play. Can they serve as spaces where time travel is imagined not only to re-experience history but also to confront the complexities of an unknown future? This dual orientation—embracing both past and future—could position museums as dynamic participants in the temporal continuum, aiding society in navigating the challenges and possibilities of a constantly evolving world.

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Resurgence Of The Excavation Site And Museum Engagement: (A Case Study Of Mongchontoseong Earthen Fortification In Seoul, South Korea)

MinSeong Kim

Korea, Seoul Baekje Museum
kims86@seoul.go.kr

- **Abstract**

This presentation will examine how museum-directed excavations have been used in various social ways over time, and how the role of the civic museums transformed into public history engagement through long-term excavation. Focusing on the excavation of Mongchontoseong Earthen Fortification site(hereafter Mongchontoseong) in Seoul, South Korea. This case study will provide insights into the changing role of museums as dynamic social/public spaces associated with prolonged fieldwork projects. Mongchontoseong was first identified by South Korean academia through the surveys in 1916 and 1917, and was designated as National Historic Site No. 297 in 1982. Subsequently, a six-year excavation was conducted from 1983 to 1989, led by university museums to build a large-scale stadium for the 1988 Seoul Olympic Games. In 2013, academic excavation resumed along with the construction of the Seoul Baekje Museum.
As of 2024, the 11-year-excavation of Mongchontoseong shows significant advancements from the past efforts. While earlier excavations helped archaeologists understand the history of the early Baekje state (c. 300-475), the archaeological findings had been confined to the archaeologists' discourse However, after the 2010s, increased interaction between the museum and public has revealed the region's history, encompassing education on excavation sites, exhibitions of excavated artifacts, the use of VR and AR to restore the historic landscape, and many events related to Baekje.

Keywords: Mongchontoseong, Baekje, Three kingdoms era, Hanseong, Earthen fortification, 1988 Seoul Olympic, Olympic park, Plow, Wooden tablet, Reservoir, Rammed earth technique, Worked wood, Timber, Animal bone

- **Introduction**

I aim to explore how the excavation findings of Mongchontoseong earthen fortification, currently being conducted by the Seoul Baekje Museum, are being utilized in comparison to past research outcomes. By examining various examples, I will also reflect on how these changes are resonating with the public today.

- **Overview of Mongchontoseong earthen fortification excavation**

A brief explanation of Mongchontoseong earthen fortification (hereafter mongchontoseong) in Seoul, which serves as a case study for this presentation. MongchonToseong is a site from the Baekje period of Korea's three Kingdoms era. The Three Kingdoms period refers to the time when Goguryeo, Baekje, and Silla were rivals for dominance, with Baekje being one of the prominent states among them. Baekje was the first of the three kingdoms to flourish, and it can be divided into three periods based on the periods of its capital: the Hanseong period, the Ungjin period, and the Sabi period. The Hanseong period of Baekje refers to the time from its founding in AD 18 until its fall to Goguryeo in AD 475, before the capital was moved to Ungjin.

After the conquest of Goguryeo, in AD 676, Silla unified the Three Kingdoms and incorporated the territories into its realm. Through this process, various archaeological remains and artifacts from Goguryeo, Baekje, and Silla (Unified Silla) have been excavated together at the Mongchontoseong site.

After Seoul was selected as the host city for the Olympics in 1981, major changes began to take place in the Bangi-dong area of Songpa-gu, as it was designated as the site for the Olympic Stadium. To construct the stadium and park, a total of six excavation campaigns were led by the Seoul National University Museum from 1983 to 1989. Subsequently, academic excavations resumed 30 years later in 2013 with the establishment of the Seoul Baekje Museum.

- **11 Years of Monchontoseong earthen fortification excavation achievements**

The excavation of Mongchontoseong, which started in 2013 as the fourth phase of excavation, is ongoing. During the first excavation phase, numerous Unified Silla settlements, wells, and road features were discovered. Especially, while Unified Silla settlement sites have previously only been found in the outskirts of Seoul, more than 20 settlement remains were identified within the limited excavation area at Mongchontoseong. This suggests that the area continued to be an important site even after the fall of Baekje.

The second excavation phase provided insights into the internal structure and spatial utilization of the North Gate area of Mongchontoseong, as well as the civil engineering techniques used in the construction of roads. Additionally, a large water reservoir was discovered inside the roundabout. As the excavation area expanded, a variety of artifacts were unearthed. in particular, the human face-shaped lid knob and the Baekje jar with inscription of '宮'(宮=palace)discovered during this excavation are now considered some of the most representative artifacts of Mongchontoseong.

Inside the water reservoir of the roundabout, wooden structure with post holes was found, along with a horse skull that was placed close to the floor of the reservoir. The upper part of the skull shows signs of a depressed indentation and the lower jaw of the horse was removed.

Additionally, on the outer side of the North Gate area, a living surface was identified with numerous traces of animal and human footprints, providing further evidence of past human activity. The third excavation phase focused on investigating the roads, water reservoir, and pit building sites. So far, the identified roads can be broadly classified into the inner circulation road that runs along the fortress walls and the north-south and east-west roads that cross through the inner area of the fortress. The presence of numerous building remains inside these roads suggests that the area was subdivided by the road network.

In addition, through the study of the water reservoir, it was confirmed that they were wooden-walled reservoir. The excavation also revealed patterns of disposal and later use of these reservoir, with various worked wood materials, including animal bones, shellfish, and bone implements, being unearthed. The ground sills and large timbers excavated from the floor of the reservoir. It can be observed that the ground sills were used to connect the floor and the walls, enhancing structural stability. In particular, a wooden tablet from the Goguryeo period and a plow were discovered during this excavation. These items are currently recognized as the oldest wooden tablet and plow ever found in Korea.

The fourth excavation phase is currently focused on the final stages of investigating the fortress walls and the water reservoir. Research related to the construction of the reservoir is ongoing, with efforts to understand the structure of the wooden-walled reservoir and the extent of the area occupied by the reservoir prior to the use of wooden-wall. During this excavation, another wooden tablet and plows were uncovered. A total of two plows were found, bringing the total number of plows discovered at the reservoir to four. These are the oldest plows ever found in Korea, and they represent the largest number of plows discovered in a single site. The excavation of the fortress walls began this year, so progress is still limited. However, meaningful results were obtained, as traces of rammed earth construction were discovered within the walls.

- **Utilization of Excavation Results**

In the 1980s, only archaeologists and journalists had direct access to the excavation findings. The public could only learn about the results through news outlets, which offered limited, one-way communication. The current excavation is also being made public through advisory meetings, academic conferences, and on-site reporting; however, it can be said that there are significant differences in terms of the quantity and quality of information, the target audience, and communication methods compared to the past. Public access is now open to a wide range of social groups and age demographics interested in archaeology and Mongchontoseong. Since its initiation for public audiences, the number of applicants for site visits has rapidly increased each year. Moreover, information is delivered through various media formats, going beyond the fragmented details often shown in news reports. In particular, documentaries provide more in-depth and specialized content, while instant communication is achieved through platforms like YouTube Shorts and Instagram.

In the field of exhibitions, artifacts uncovered at excavation sites are now being connected to other historical sites or cultures. Exhibitions are not only published as catalogues but are also available in digital formats, such as e-books that can be easily downloaded. Moreover, for those unable to physically or temporarily visit the exhibitions, online exhibition guides and VR exhibitions are provided.

Digital technology is widely used in the research and application of excavation results. What you're currently viewing is a digital model of landscape restoration. Mongchontoseong, Seokchon-dong tombs, and Pungnap-toseong are

representative archaeological sites of the capital city of Hanseong. These sites are sequentially undergoing environmental and archaeological verification and restoration.

The study and restoration have provided essential foundational data to identify the structure of the Baekje royal capital and to visually reconstruct its features. Moreover, such materials are being utilized not only for research purposes but also to offer experiential exhibitions in museums. Additionally, such materials are being used not only for research but also to provide experiential exhibitions at the museum. The photos you see are of the exhibition experience machine on the first floor of the museum. Through this machine, citizens can experience the digital content of the restored Baekje royal capital landscape, linked to the exhibition.

The Seoul Baekje Children's Museum, which officially opened in 2024, has transformed the previously exhibition-centered Mongchon History Museum (established in 1991) into an interactive museum designed for children. the Seoul Baekje Children's Museum, which also offers another type of experiential exhibition. This change reflects not only the aging of the facilities but also the situational characteristics resulting from the construction of large apartment complexes around the museum since 1991, which has led to an increased demand from a diverse range of visitors, particularly children and family.

The new exhibition space combines cutting-edge digital displays with analog hands-on experiences in outdoor areas, fostering curiosity and critical thinking about historical and cultural topics. Moreover, the museum provides relaxation spaces and various cultural experiences for visitors. In particular, the exhibition room that replicates an archaeological research lab offers materials and experiences related to the post-excavation work that cannot be seen elsewhere. It also displays items that our excavation team actually used in the excavation site right next door. There are many other activities such as artifact assembly, pottery making, and block wall construction.

The app "Everyone's Mongchontoseong," is developed by the Seoul Baekje Museum. This app is a digital experience program utilizing cultural heritage, combining history and new technologies to provide citizens with opportunities to experience digital content and learn about the significance of Mongchontoseong. By selecting a tour course and completing game missions, the app uses AR technology, allowing anyone to enjoy the experience using only a smartphone camera, without the need for a headset or high-performance PC.

• Conclusion and Recommendations

As exemplified by the Seoul Baekje Museum and the Mongchontoseong excavation, museums are increasingly striving to create opportunities for citizen participation, engagement, and information sharing. With the invention of various digital technologies that did not exist in the past, they are not only assisting in excavation and research but also playing a major role in communication with the public. These technologies allow people to visit archaeological sites and museums that may be difficult to physically access or closely examine artifacts that are hard to view in person, thus enhancing immersion and interest.
These changes are bringing museums and excavation sites closer together, while also positively transforming the public's perception and image of both Museums like the Seoul Baekje Museum and the Mongchontoseong excavation are increasingly embracing digital technologies to boost public engagement and participation. These advancements enhance access to archaeological sites and artifacts, allowing for virtual visits and detailed exploration, even from afar. As a result, museums are fostering greater connection with the public and reshaping perceptions of cultural heritage.

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Public-Facing Archaeology—A Case Study of the Archaeological Special Exhibitions at the National Museum of Prehistory

Shuyuh, Yao

National Museum of Prehistory(Taiwan)

Shuyu417@nmp.gov.tw

- **Abstract**

Archaeological research often faces limitations due to its specialized nature and the lack of professionals in Taiwan, resulting in fewer archaeological exhibitions in the early days. Additionally, political influences have led to a general unfamiliarity with Taiwan's prehistory among the public. However, in recent years, Taiwan's archaeologists have shifted towards promoting public archaeology, with scholars stepping out of their ivory towers and engaging with the public. The National Museum of Prehistory has been actively promoting archaeological exhibition education, using the land as a link between prehistoric and contemporary populations, and attempting to present research findings in accessible and engaging ways to the public.

This article will use the 2024 special exhibition "Micro Perspective, Historical Perspective" as an example to share how the National Museum of Prehistory in Taiwan translates and promotes research findings on microscopic evidence such as Phytoliths, Nephrites, Glass, and Minerals. By combining psychedelic and colorful styles with interactive installations, the museum aims to reach and engage a more diverse audience.

Keywords: Archaeological Exhibition, Public Archaeology, Archaeological Museum

- **Introduction**

The findings of archaeological research, such as excavation reports or academic articles, often tend to use overly complex language. Traditionally, academia emphasized professional, academic, and authoritative discourse, and museums frequently adopted a textbook-like approach to unidirectionally convey knowledge. This style has made it challenging for the public to access and understand archaeological knowledge, rendering prehistoric history—which is already quite unfamiliar—more rigid and less approachable.

However, in recent years, with the rise of public archaeology, Taiwan's archaeological community has also begun actively introducing archaeology and the importance of cultural heritage to the public. Archaeology departments in universities have started offering courses focused on teaching students how to promote archaeology to the public. Some excavation projects also incorporate educational outreach, allowing the public to visit and learn about the process as it unfolds. Museums, of course, were among the earliest institutions to take on this mission of public outreach and education.

The challenge lies in the method of translation—how to transform complex and critical academic content into forms that the public can easily understand. This has been a primary goal for archaeologists at the National Museum of Prehistory (NMP) in recent years. The concept of "Public-Facing archaeology" is one we have aimed to express in the planning of our archaeological exhibitions.

- **Background**

(1) Introduction to the NMP

In July 1980, construction for a new train station in Taitung, located in southeastern Taiwan, uncovered a lot of precious artifacts—pottery, jade, slate coffins, and architectural structures buried underground for thousands of years. After nine years of intensive salvage archaeology the site yielded abundant artifacts and valuable research findings. This site, known as the Peinan Site, has since been designated as a national heritage site. Recognizing its significance and the abundance of artifacts uncovered, experts and scholars advocated for establishing the "Peinan Cultural Park" at the site. Alongside this, plans were made to establish Taiwan's first national archaeological museum to preserve, research, and exhibit these artifacts. Since construction at the actual site was deemed unsuitable, the museum was built at a nearby location. In 2002, the NMP and the on-site Peinan Cultural Park officially opened to the public.

In addition to protecting the site and preserving artifacts, the museum also displays the outcomes of archaeological research to the public and continues to promote educational outreach.

Taiwan's archaeological and cultural heritage preservation efforts entered a new phase due to the destruction and subsequent salvage of the Peinan Site. The remarkable jade, pottery, and stone artifacts unearthed from the Peinan Site made headlines in Taiwan, sparking unprecedented public interest in archaeology. This fascination extended beyond archaeology to a surge in the collection of ancient artifacts. In response to this public enthusiasm and the government's growing focus on cultural heritage preservation, Taiwan passed the "Cultural Heritage Preservation Act" in 1982, establishing more concrete protections for monuments and artifacts.

After reviewing the history of Taiwanese archaeology and observing the ongoing salvage excavation of the Peinan Site, Miyazawa Eiichi (1987) suggested that the Peinan excavation served as a turning point for archaeology in Taiwan, making the field more accessible to the public. The Peinan artifacts were even displayed to the public at the time, providing what Eiichi described as "enlightenment, fostering public awareness of archaeology". The salvage excavation of the Peinan Site laid the foundation for connecting archaeology with the public, while the establishment of the NMP signified a new chapter in which archaeology moved beyond academic research, embracing its role in sharing discoveries with society.

(2) Recent Efforts in Knowledge Translation at the Museum

Since the NMP officially opened to the public in 2002, the "Prehistoric Taiwan" exhibition hall has served as a vital medium for presenting archaeological findings to the public. However, the traditional display style in the early years primarily consisted of static text and image panels combined with artifact displays. While this format made information more accessible compared to research reports, it often felt like a history textbook, which could come across as monotonous, limiting the museum's ability to reach a broader audience.

In recent years, we have made efforts to translate archaeological knowledge in different ways, aiming to expand beyond our usual audience and spark wider public interest in archaeology. For instance, we collaborated with novelists and comic artists to release *Son of the Storm: The Lost Ancient Civilization of Taiwan (風暴之子：失落的臺灣古文明*) and *Jue: Separate Twins(玦-孿生)*. These works reframe archaeological materials as vivid narratives through the creators' perspectives, allowing the public to connect with prehistoric cultures in a more approachable and engaging manner..

Image 1: The novel and comic book used archaeological material into vivid narratives

Additionally, we launched a series of archaeological exhibitions in collaboration with an illustrator, featuring adorable cats transformed into archaeological team members, museum staff, and prehistoric figures. Through these charming illustrations, we introduce archaeological work and key research findings in a fun, accessible manner, successfully attracting many individuals who previously had little interest in archaeology to learn more about the field. This approach has proven effective in breaking through the conventional audience base and expanding interest in archaeology among new and diverse visitors.

Image 2: A series of archaeological exhibitions in collaboration with an illustrator, featuring adorable cats transformed into archaeological team members, museum staff, and prehistoric figures.

- **Introduction to the special exhibition: Content and Approach**

In 2024, we presented the “Micro Perspective, Historical Perspective” archaeological special exhibition series in two of our museum venues, offering an archaeological perspective on the narrative of "Taiwan’s 400-Year History." The year 1624, marking the beginning of Dutch colonial rule, is often considered the start of Taiwan’s documented history and its emergence onto the global stage. This period is heavily emphasized in Taiwanese history textbooks, which cover major events from these four centuries.

However, archaeological findings suggest that people have inhabited Taiwan since the Paleolithic period, around 30,000 years ago. Furthermore, by the late Neolithic period, over 4,000 years ago, Taiwan’s inhabitants were already interacting with groups beyond the island, leaving behind material evidence of this exchange. Accordingly, our Taiwan Prehistory permanent exhibition hall, which reopened in 2023, tells the rich and complex stories of the people who lived on this land from 30,000 to 500 years ago. Building on this, the special exhibition reveals how archaeology uses microscopic analysis to uncover Taiwan’s connections to the broader world thousands of years ago. Throughout history, the ocean has not been a barrier for Taiwan but rather a pathway connecting it to the world.

This exhibition invites visitors to view history through the microscopic lens of archaeology, offering a broader understanding that challenges the traditional, text-based narrative of Taiwan’s history and highlights the island’s ancient global connections.

(1) Core Concepts and Content of the Exhibition

The main focus of the exhibition revolves around archaeological findings of microscopic evidence, sometimes as small as micrometers (μm), which reveal significant historical developments from Taiwan's prehistoric past. The exhibition highlights recent major findings and research in Taiwan archaeology, including scientific analyses of materials such as phytoliths, nephrite, glass, and minerals. These findings illuminate the ways of life of people who lived in Taiwan thousands of years ago and their connections with the outside world, highlighting Taiwan’s unique role in prehistoric global history.

At the beginning of the exhibition, we showcased phytoliths. Phytoliths represent an emerging field of research in recent years. Through experimental techniques and microscopes, archaeologists can extract these tiny silicate particles from archaeological sites. While plants decompose over time, phytoliths remain preserved due to their durability. The distinct shapes and characteristics of phytoliths enable researchers to identify various plant species, thus offering insights into ancient environments, prehistoric diets, and plant utilization.

Image 3: Vibrantly Colored Phytolith Exhibition Area

Traditionally, archaeologists have inferred aspects of prehistoric life, such as the presence or absence of agricultural practices, through the artifacts, particularly tools associated with farming. Phytolith research, however, offers new perspectives. For instance, the discovery of abundant indica rice phytoliths

at the Peinan Site reveals that, as early as 3,500 years ago, agriculture in Taiwan's eastern region was well-established, allowing us to reconstruct vivid scenes of prehistoric fields and villages.

The second part of the exhibition focuses on nephrite. In Chinese culture, the term 'jade' refers to various precious stones, with green nephrite being particularly cherished throughout history. Taiwan has its own nephrite deposits, primarily located in the eastern region of the island. Chemical analysis of inclusions in Taiwanese nephrite reveals unique elemental ratios that differ from nephrite found elsewhere, distinguishing Taiwan jade. This characteristic enables researchers to trace the origin of nephrite artifacts and determine whether they were sourced from Taiwan or other regions. Prehistoric jade artifacts have been discovered throughout Taiwan, and similar ornaments have also been found in Southeast Asia. Comparative analyses confirm that certain Southeast Asian jade ornaments share the distinct elemental composition of Taiwan nephrite (Hung,2007). This suggests that some of these artifacts, despite their Southeast Asian style, were crafted from Taiwan jade, unveiling a prehistoric network of jade production, processing, and export, along with intercultural exchanges. Archaeological research thus reveals that, as early as 4,000 years ago in the Neolithic period, there were products "Made in Taiwan" exported to Southeast Asia.

Image 4: Dynamically showcasing the exchange of Taiwan Jade within and beyond the island

The third part focuses on glass. Colorful glass beads in red, blue, green, orange, and yellow began to appear in Taiwan during the Iron Age, gradually replacing the dominant jade culture. These simple, small beads, typically no more than 1 cm in diameter, are difficult to trace based on their appearance alone. However, chemical analysis of glass composition provides crucial clues. Since glassmaking primarily uses silica sand, which has a high melting point, various additives are needed as fluxes to lower the melting temperature and as colorants to create vivid colors. Different chemical compositions indicate different origins. By analyzing these tiny glass beads excavated in Taiwan, researchers trace them back through intermediate trade routes in Southeast Asia and ultimately to distant origins in South Asia or West Asia. Such findings reflect extensive prehistoric trade and interaction networks. Through microscopic analysis, archaeology uncovers layers of cultural diversity and connections, expanding our understanding of ancient social interactions.

The final section focuses on minerals. Pottery research is fundamental to archaeology, as pottery serves as a medium for exploring ancient craftsmanship and culture. By comparing shapes and forms, archaeologists can identify potential functions, regional relationships, and relative dating. Microscopic examination of pottery surfaces reveals details such as manufacturing techniques, decorative methods, and surface treatments, offering valuable insights into the craftsmanship of prehistoric potters. Additionally, geological analysis of thin pottery slices (0.03 mm thick) offers a deeper look into the mineral composition of clay and temper materials, revealing the probable sources of the clay. Different geological environments yield distinct clay mineral compositions, allowing researchers to identify whether the clay was sourced locally or transported from elsewhere. Thus, pottery research extends beyond stylistic studies, using microscopic mineral analysis to map potential networks of interaction among ancient communities.

Image 5: Visual imagery of the minerals and thin section exhibition area

(2) Visual Effects and Experience

In designing the overall visual effects of the exhibition, we embraced a vibrant and colorful approach, inspired by the fascinating microscopic world of archaeological materials. Each thematic area features magnified, often invisible, micro-evidence to ignite visitor curiosity. These bright colors and striking lighting effects draw people in, encouraging them to take photos and share their experiences on social media, enhancing the exhibition's visibility.

Alongside authentic archaeological specimens for close observation, we have incorporated touch and interactive elements. In Taiwan, strict conservation standards in museums require display cases to control humidity and maintain stable temperatures, which limits opportunities for visitors to physically handle artifacts. However, hands-on experiences, along with visual and auditory ones, play an essential role in helping visitors appreciate the texture of artifacts or experience how jade ornaments were once worn. In the jade section, we display both exquisite jade artifacts and raw material directly from mining areas, as well as thin nephrite slices backlit in panels, allowing visitors to touch the material and observe its natural textures. In the minerals section, we provide rocks from different geological environments for visitors to handle, enabling them to feel the differences among stones and to understand how archaeologists trace the origins of materials through mineral analysis.

Image 6: Touchable jade ore display

Image 7: Touchable rocks displayed according to geological environment

Jade ornaments held cultural significance in Taiwan's prehistoric period, but they are usually too delicate to be handled. Fortunately, our museum's advanced 3D lab enables us to scan and model artifacts, producing realistic replicas in resin or similar materials. We created 3D-printed replicas of selected jade pieces, allowing visitors to wear and experience them firsthand.

Image 8: 3D-printed replicas of selected jade pieces, allowing visitors to wear and experience them firsthand.

In the phytolith section, we introduce the shapes and types of plant phytoliths, which are typically difficult to connect to actual plants. To bridge this gap, we designed an interactive pull-tab display that allows visitors to compare phytoliths with the real plant specimens, follow the perspective of archaeologist—each unique phytolith represents an ancient plant.

Image 9: We designed an interactive pull-tab display that allows visitors to compare phytoliths with the real plant specimens

Another interactive feature is found in the glass section. Here, we present how the chemical composition of glass reveals its origin, with different glass colors indicating compositional differences. To deepen understanding, we created a simple interactive game that guides visitors through the process of making glass by selecting ingredients and steps, simulating the experience of ancient glassmaking.

Image 10: Simulating the experience of ancient glassmaking

Whether in visual or interactive design, we have carefully considered the visitor's perspective. Our goal is to convey archaeological research findings in accessible ways, inviting a broader audience to connect with the exhibits and sparking the interest of diverse groups who might otherwise not engage with archaeology.

- ## Discussion: Towards an Engaging Archaeology

Kotler (1999) observed that museum models have shifted from collection-centered to education-centered, and ultimately to experience-centered approaches. The term "public archaeology" was first introduced in 1972, and after years of discussion and practice, the field has recently expanded its focus beyond academia to engage with diverse audiences (Matsuda, 2004:66-71). Consequently, archaeological museums must adapt to contemporary society by considering visitors' experiences and needs, moving beyond a mere unidirectional transmission of research findings.

While the NMP is located far from metropolitan areas and has limited accessibility, its visitor base is mainly composed of tour groups, local school field trips, and family groups, whose primary motivation is leisure (Hsia, 2003). Taiwanese people's historical knowledge has long been influenced by political factors, and school history curricula often provide only minimal coverage of prehistory, leading to a widespread lack of knowledge about Taiwan's prehistoric past. In contrast, many people in Taiwan are more familiar with Chinese history. This lack of background knowledge, combined with the complexity of archaeological findings, has left the public relatively disengaged from Taiwan's prehistory."

Hood (1983) categorizes museum visitors into frequent visitors (three or more visits per year), occasional visitors (one to two visits per year), and non-visitors (those who do not visit museums within a year). Frequent visitors generally value learning and new experiences, while occasional and non-visitors seek social interaction, relaxed settings, and active engagement. Lin (2006) found that non-visitors often lack interest in museums due to their strong educational and learning-oriented purpose, preferring instead more relaxed and enjoyable leisure experiences, which often creates a psychological distance from museums.

We strive to bridge this gap. Despite having a rich collection and substantial research findings, most visitors remain occasional, and residents or tourists in Taitung often find museums uninspiring or overly educational. Thus, the key to change may lie not in the richness of the content but in its attractiveness and entertainment value. As Hong (2005) suggests, museum visits are a leisure activity that includes learning, socializing, and entertainment, and museum design should blend education with enjoyment, avoiding information overload, which can lead to "museum fatigue." Chen (2022) similarly suggests that incorporating entertainment and social elements into exhibitions can enhance visitors' retention of knowledge.

In our satisfaction survey for this special exhibition, 51.7% of visitors visited the NMP for the first time, and 40.1% visited specifically for this exhibition, indicating that our diverse design approaches may have successfully attracted new audiences.

In summary, archaeological museums should work to translate knowledge in various ways, using multimedia, videos, and tactile interactive experiences. While these methods have been applied in various aspects, the challenge remains to effectively combine the authenticity of archaeological findings with engaging, entertaining elements. By making prehistory more interesting and transforming the experience of visiting archaeological exhibits into a fun activity, museums can break beyond traditional audiences, encouraging more people to engage actively and develop the comprehension of preserving cultural heritages.

Image 11: Museum design should blend education with enjoyment

- ## Conclusion and Recommendations

Compared to permanent exhibitions, which require substantial funding and rigorous planning for long-term display, special exhibitions offer great flexibility for experimentation. Their short-term nature allows for innovative designs aimed at attracting diverse audiences. By engaging visitors through

interactive and storytelling methods, these special exhibitions make archaeology more accessible and enjoyable, encouraging a willingness to learn and absorb new knowledge.

Beyond making archaeological knowledge engaging, fostering a sense of empathy among visitors remains a key objective. Taiwan's prehistoric culture can feel distant from contemporary society, and in Taiwan's predominantly Han population, prehistoric history is often perceived merely as ancestral stories of Indigenous peoples, making it challenging to establish an emotional connection. Our recent efforts focus on centering the land itself, linking the people who once lived on this land with those who live here today. Although there may not be a direct ancestral connection between contemporary society and prehistoric communities, we all share this land. Understanding and respecting the past fosters a deeper appreciation for Taiwan's diverse and inclusive society.

Currently, we are also developing a new permanent exhibition hall, the "Contemporary Archaeology Hall," scheduled to open in 2025. This hall will focus on significant contemporary themes, including disaster, gender, cultural rights, and food, addressing modern issues through archaeological research and reflecting on our future. This approach allows visitors to see the social relevance of archaeology and to engage with the exhibit more easily through their own experiences.

Ultimately, archaeology must return to the public, and we aim to present it in diverse and engaging ways that inspire people to understand the past of this land and recognize the importance of preserving cultural heritage.

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MICMAH ICOM International Committee for Museums and Collections of Archaeology and History

Digitalization as Decolonization: new strategies to multivocality in archaeological sites and museums

Marta Lorenzon

Centre of Excellence in Ancient Near Eastern Empires, University of Helsinki

marta.lorenzon@helsinki.fi

• Abstract

This paper examines the potential of digital applications in archaeological settings, such as museums and archaeological sites across different geographical contexts in southwest Asia. Digitalization combined with community archaeology is presented as an essential tool for decolonization with a particular emphasis on issues of data availability, collective curation, and practical implementation.
I discuss three case studies in diverse countries—Jordan, Iraq and Egypt—to showcase how these newly developed methods not only offer opportunities for multivocality and collaborative curation, but they also raise concerns about heritage protection. This perspective, however, may underestimate the capacity of local communities to safeguard their heritage.

Keywords: decolonization, archaeology, computational archaeology, digitalization

• Introduction

The decolonization of archaeological practices has gained critical importance over the past 20 years, fostering an environment of respect and reciprocal exchange with local and indigenous communities and supporting the co-creation of narratives in museums and at archaeological sites (Abu-Khafajah and Miqdadi 2019; Lorenzon, Bonnie and Thomas 2022; Lydon and Rizvi 2010; Smith and Wobst 2004). In previous contributions, I identified community archaeology and the digitalization of cultural heritage as the two key factors in decolonizing the discipline (Lorenzon, Bonnie and Thomas 2022). These aspects play a vital role in providing communities with access to their heritage and enabling their active participation in its management (Lorenzon and Zermani 2016; Lorenzon and Miettunen 2020; Lorenzon, Bonnie and Thomas 2022). Here, decolonization refers not to a politically motivated movement (Rizvi 2006, 2019) but to a social movement that recognizes and incorporates local narratives into archaeological knowledge, while simultaneously dismantling outdated stereotypes to encourage collaborative, inclusive approaches in heritage studies.

The ethical discourse within archaeology increasingly emphasizes the need to decolonize the profession, both in museum contexts and at archaeological sites. Essential to this shift is digitalization as a key instrument to participatory practices around data ownership, accessibility, and transparency in archaeological information, all of which should be prioritized in new projects (Bernbeck and Pollock 2005, 2008; Lorenzon, Bonnie and Thomas 2022). In recent decades, artefacts, monuments, and cultural objects have come to be understood not only as historical remains but also as representations of diverse stories, emotions, and identities. The rising demand for digital modelling and visualization technologies has transformed archaeological museums and sites, enabling these tools to play a vital role in community engagement. By integrating digital techniques with community archaeology, local communities can participate actively in decision making about their heritage—guiding its preservation and shaping research questions that resonate with their lived experiences (Atalay 2012; Lorenzon and Miettunen 2020; Joudeh and Lorenzon 2023).
However, southwest Asian archaeology has historically struggled with digitalization of cultural heritage and open access as data frequently remains unpublished and inaccessible to the public (Bernbeck and Pollock 2005; Lorenzon, Bonnie, and Thomas 2022; Steele 2005). This approach, though sometimes defended as heritage protection, perpetuates significant inequalities between archaeologists, local communities, and western institutions, hindering the progress of decolonizing narratives.

Community archaeology has often bridged the gap between different stakeholders, pushing the discipline towards a more inclusive local narrative not only in including local communities in archaeological research but in making them a vested partner in designing questions and management strategies (Naser and Tully 2019; Lorenzon and Zermani 2016; Thomas 2017). Therefore, community-digital archaeology has evolved into a collaborative endeavour where archaeologists and communities co-create archaeological narratives, fostering a multivocal, inclusive, and decolonized approach to the discipline. This digital shift not only enhances the

preservation of cultural memory but also empowers communities to redefine the interpretation and meaning of their own heritage, challenging archaeology's colonial roots (Jeffrey et al. 2020; Lorenzon, Bonnie, and Thomas 2023; Mohareb, Alsalloum and Webb 2023).

In this contribution, I discuss three case studies from different areas of the Southwest Asia (or Middle East) and North Africa— the TYRAS project in Jordan, Kalar and Slemani in Iraqi Kurdistan and the Tell Timai in Egypt—which illustrate the importance of integrating digital methods with community archaeology to create a more inclusive, multivocal interpretation of the past.

• TYRAS case study: Archaeological excavation and digitalization in Jordan

The Tell Ya'moun Regional Archaeological Survey (TYRAS) project is a collaborative field and community project coordinated by the University of Helsinki's Centre of Excellence in Ancient Near Eastern Empires (ANEE) and the Department of Anthropology and Archaeology at Yarmouk University, Jordan. This project aims to explore connections between regional centres in the southern Levant and the capitals of southwestern Asian Empires in the 1st millennium BCE. During our 2022 survey, we covered nearly 300 km², confirming and documenting previously identified sites through satellite imagery, a method frequently applied in Southwest Asian and North African surveys (Casana 2014; Comer, Harrower and Ur 2013). Following this survey, we began excavations at the sites of Tell Ya'moun and Tell al-Assara to better understand the roles of rural centres in northern Jordan (Lorenzon et al. 2023; Lorenzon et al. forthcoming).
One of our primary objectives was to use advanced digital technology to document excavation findings, including artefacts. This documentation had two main goals: first, to gain insights into the materials' forms and manufacturing techniques; and second, to create an accessible database of materials that we could share with both local and wider academic communities. During the excavation, we engaged in multiple community activities with local residents from the village of Shatana and schools of the Balila area, coordinated by Päivi Miettunen, ANEE community archaeology coordinator, and Mohammed Shunnaq, a scholar from Yarmouk University.

Initially, we applied photogrammetry on the exposed architectural walls to assist in the digital reconstruction of the site, enhancing our understanding of the structural layout and helping visualize how these spaces may have appeared in antiquity. Our architectural reconstruction of Tell al-Assara not only helped us understand the relationship of the fortress to the landscape but also provided a concrete tool to illustrate the ancient architecture to the local communities and schools that visited the site during fieldwork (Figure 1).
Then, we also applied this method to artefact reconstruction such as the incense burner we discovered during excavation at Tell Ya'moun and an inscribed pottery sherd we found during the survey at Tell al-Assara (Figure 1). The 3D models of these objects and structures serve not only research and educational purposes but also function as tools of decolonization, granting access and agency to diverse audiences who can build narratives and contribute to a multivocal reconstruction of the past. For instance, we documented the inscribed sherd through photogrammetric analysis and 3D modelling, but we also analysed micro-traces to determine the direction of the script, thereby enhancing our understanding of the inscription. To achieve this, we employed photogrammetry and infrared photography to make the inscription legible and accurately capture each letter, particularly those near broken edges (Kautonen et al. 2024). We then had a discussion with local specialists about traditional inscription and pottery practices and their opinion on how the script and the pot were created. This was incredibly beneficial in understanding not only the script but also in detecting a fingerprint impression close to the script and its use as well explained by members of the local community in Shatana.

Figure 1. 3D model of Tell al-Assara walls (on the left) and inscribed sherd (on the right) (Courtesy of the Centre of Excellence in Ancient Near Eastern Empires).

To engage the broader community, including our collaborators on- and off-site, we are making 3D models of diverse artefacts from excavation, which are publicly available on Sketchfab (https://skfb.ly/p8AFX) and can be accessed and downloaded by the public. Since these fragile materials are currently in storage due to the abundance of materials from the excavation and lack of suitable display facilities, digitalization offers the most effective way to share our discoveries with colleagues and the public. This approach allows us to extend access to valuable archaeological insights beyond the physical limitations, promoting wider educational and cultural engagement, but also involving the communities in the interpretation of the site and its finds (al-Smadi et al. forthcoming; Bonnie, Gheorghiade and Al-Sababha forthcoming).
A similar successful case study employing 3D reconstruction and community engagement was conducted by Safa' Joudeh at the Jerash Museum. Her brilliant work focuses on the reception of 3D models of classical statues from Jerash, created as part of a conservation campaign to restore and publicly display nine marble figures from the Great Eastern Baths (Joudeh and Lorenzon 2023). These models allowed viewers to better understand the restoration process and visualize the intended display, generating questions and follow-up discussions—particularly among students—that led to a collaborative approach in planning the future exhibit (Joudeh and Lorenzon 2023). Within the TYRAS project our aim is to combine digitalization and community archaeology not only in museum settings but also at archaeological sites, involving the local communities in the interpretation of the past (al-Smadi et al. forthcoming; Bonnie, Gheorghiade and Al-Sababha forthcoming).

- **Comparative case studies: Iraq and Egypt**

The use of digital tools in archaeology, intertwined with community outreach initiatives to make the field more inclusive, is not a new development in MENA research, and multiple case studies have successfully linked digitalization and community archaeology, highlighting how technology can empower local communities, broaden participation, and enrich archaeological interpretation through collaborative efforts.
The "Archaeological Practice and Heritage Protection in the Kurdistan Region of Iraq" initiative, led by Professor Claudia Glatz (University of Glasgow), regional antiquities departments (i.e., Sulaymaniyah Department of Antiquities, the Slemani Museum, the Garmian Department of Antiquities, the Garmian Civilizations Museum) and international partners like the University of Glasgow and INHERIT, develops innovative museum spaces and outreach strategies to strengthen public engagement with local heritage. These efforts aim to empower communities by making archaeology accessible and interactive, using digital tools to transform the museum experience (Glatz et al. 2024a; Glatz et al. 2024b).
A central component of this initiative is the "Are You an Archaeologist?" exhibit at the Garmian Civilizations Museum in Kalar. This exhibit invites visitors to become active participants in the archaeological process through hands-on and digital experiences. For example, life-size landscape photography and immersive displays guide visitors through the archaeological process from data collection to site interpretation (Glatz et al. 2024a; Glatz et al. 2024b). The exhibit includes 3D trench models and an interactive excavation area, where visitors can physically dig and explore a digital reconstruction of a room believed to have been used for feasting. This use of digital augmentation not only helps convey the archaeological process but also emphasizes the significance of context—demonstrating how artefacts and spatial associations contribute to understanding past cultures (Glatz et al. 2024a; Glatz et al. 2024b). Likewise, the project also created a children space at the Slemani Museum, which supports local outreach through "heritage boxes," educational kits for school use. These boxes contain replicas of pottery, cuneiform tablets, and other tools related to ancient life and writing practices, designed in collaboration with Iraqi and international educators, moving beyond the traditional curricula and expanding the access to cultural heritage across urban and rural communities (Glatz et al. 2024b).This case study demonstrates how digitalization can foster multivocality in museum settings, featuring displays tailored to specific audiences, such as children, while extending its impact to engage the broader community and invite feedbacks.

The third case study centres on Tell Timai, an ancient city in Egypt's Nile Delta, where conservation efforts were conducted in collaboration with the local community of Timai El-Amdid during field seasons in 2013, 2014, and the summer of 2023. Together with local residents, and under the guidance of the Supreme Council of Antiquities, we produced thousands of mudbricks for the preservation of the site's standing earthen architecture, which, despite multiple occupation phases, predominantly dates to the Late Roman Period (Hansen, Soghor, and Ochsenschlager 1967; Lorenzon et al. 2020; Lorenzon, Littman and Silverstein forthcoming). The architecture, consisting of mudbrick buildings, streets, and *insulae* with walls that still rise to two or three stories is extremely fragile due to modern urbanization and progressive desalination.
The community initiative developed since 2013 has grown into a multivocal community engagement that combines earthen architecture research, a possible open-air museum and digitalization (Lorenzon et al. 2013). The local community, mainly based at the neighbouring village of Timai El-Amdid, not only has a key role

and a shared partnership in the conservation process, providing know-how and guidance during mudbrick manufacturing, but also has moved into a full partnership to help with the digitalization and develop an informal guided tour of the site, taking a vested role in its preservation (Lorenzon et al. 2013; Lorenzon and Zermani 2016; Lorenzon, Littman and Silverstein forthcoming). Specifically, the community has worked on creating some basic signs and providing informal local tours to visitors which benefit from the created architectural and 3D reconstruction of the architecture of the sites. This choice respects both the current needs of the surrounding community and the fragile environmental and architectural conditions of the site, prioritizing practical conservation over the risks associated with sustained, large-scale visitor access.
In this case, the conservation efforts illustrate a model of community archaeology in which local stakeholders actively participated in the preservation of their heritage. This approach emphasizes collaboration and sustainable heritage management, focusing on long-term preservation and community engagement rather than commercialization or heavy visitor traffic, which could further impact the already vulnerable archaeological site.

Figure 2. Local community, archaeologists and SCA employee at Tell Timai (Courtesy of the Tell Timai Excavation Project)

• Preliminary observations

Digital approaches in archaeology offer significant opportunities for decolonization by reshaping traditional power dynamics, amplifying marginalized voices, and promoting inclusive interpretations of the past. The projects discussed—TYRAS Project, "Are You an Archaeologist?" in Iraqi Kurdistan, the Tell Timai conservation initiative—each illustrate how digital tools and community engagement can transform archaeological practices.
Another example spearheaded by the Centre of Excellence in Ancient Near Eastern Empires and funded by the Finnish Cultural Foundation is the project “Make a Home Abroad,” directed by Rick Bonnie, which has strong similarities to the projects presented here. This was an interdisciplinary project that brought together specialists and local communities to explore and share the Southwest Asian histories and heritage now present in Finland (Dataset - etsin.fairdata.fi). This initiative sought to trace the often-undocumented journeys of Southwest Asian objects within Finnish museum collections—objects frequently intertwined with legacies of western colonialism. By using 3D digitization and printing, the project was an excellent example of how to create hands-on educational tools, making these historical artifacts more accessible and engaging for contemporary audiences. Through these resources, the project fostered a deeper understanding of Southwest Asian heritage, prompting reflection on cultural exchange, memory, and belonging in Finland today.

Despite differences in geographic locations, community contexts, research questions, and local priorities, these cases reveal multiple common themes. One major commonality was the clear understanding of the intricate but rewarding possibilities in combining digitalization and community archaeology.
Second, the case studies highlight a consistent drive among local communities and archaeologists to create a multivocal interpretation of the past, which contributes to the ongoing decolonization of the field.

Third, the projects all described how engaging local communities from the start in decision-making processes and site management can lead to a more collaborative environment. This participatory approach contrasts with traditional top-down archaeology where narratives were often imposed by external researchers (Thomas 2017). Programs like "Are You an Archaeologist?" in Iraqi Kurdistan and the Tell Timai conservation project show how immersive, interactive experiences can educate and empower local communities (Glatz et al. 2024; Lorenzon and Zermani 2016; Lorenzon, Littman and Silverstein forthcoming). These programs help clarify the archaeological process and invite participants to contribute their perspectives, encouraging a sense of ownership and involving communities in preservation and interpretation efforts. It also clearly demonstrates the discipline's goal to move beyond simple tokenism in community participation, making citizen involvement a priority in the archaeological decision-making process (Lorenzon and Miettunen 2020). Power and agency, therefore, do not rest only with specialists but with the entire community.
Forth, digital tools democratize access to archaeological data, shifting authority from traditional, often Western, institutions to local communities and broader audiences (Lorenzon, Bonnie, and Thomas 2022). Platforms like Sketchfab used in the TYRAS project enable 3D models of artifacts to be publicly available, allowing local and global communities to engage directly with archaeological findings. This accessibility helps to erode the top-down approach that has traditionally defined archaeology, where interpretations were restricted to academia or museums and where local communities were rarely involved in interpreting their own heritage (Thomas, 2017). By making artifacts available online, community digital archaeology invites multivocal participation, empowering diverse stakeholders—including those historically excluded from the process—to contribute insights, interpretations, and personal connections to the material culture.

Although digital tools and community outreach have wide potential to support decolonization, access to these technologies remains unequal, particularly in regions where infrastructure, funding, and digital literacy may be limited. This inequality is evident in some Southwestern Asian areas where access to digital tools and open-access data remains constrained. This lack of access and knowledge limits the participation of local communities in digital projects and restricts their ability to shape interpretations of their own heritage (Bernback and Pollock, 2008; Lorenzon, Bonnie and Thomas 2022). This limitation calls for policies that encourage open-access initiatives, which are crucial for transparency and inclusivity in archaeology (Lake 2012; Lorenzon, Bonnie, and Thomas 2022). Although the majority of the population in the MENA region has access to broadband accordingly to the ITU report (see table 1; Datahub.itu), digitalization often requires open access policies alongside digital literacy providing the information for the community to have their voice in interpreting the past.

Table 1. Active mobile-broadband subscription (Data: Datahub.itu)

Country	2018	2019	2020	2021	2022	2023
Egypt	53.1M	59.6M	66.3M	67.3M	72M	79.1M
Iraq	15.3M	16.5M	18.5M	20.7M	20.5M	23.8M
Jordan	8.73M	7.78M	6.99M	7.28M	7.63M	7.73M

• Conclusion and Recommendations

This short contribution highlights some key factors concerning how digitalization can encourage decolonization in archaeology by democratizing access to data and enabling diverse communities to engage with and interpret material culture, shifting control away from traditional narratives. Through digital tools like 3D modelling, open-access databases, and virtual reality, archaeology becomes more inclusive, allowing broader participation and valuing local and indigenous perspectives in the preservation and interpretation of history. When local voices contribute directly to archaeological storytelling, it challenges the traditional narrative authority held by external researchers and instead promotes a shared, pluralistic interpretation of history that respects indigenous and local knowledge systems.
It follows that one key recommendation is to extend local participation beyond conservation and site management to active involvement in interpreting findings. This can be facilitated through workshops, focus groups, or collaborative storytelling sessions that invite community members to share their interpretations and knowledge.
The wide Internet access in the MENA region also creates the perfect environment for sustained engagement and the possibility of developing a comprehensive digital archive accessible to both academics and local communities. Beyond 3D models, this archive could include oral histories, traditional knowledge, and localized interpretations of artefacts and sites.
Another key improvement would be to strengthen collaboration across different regions in the Southwest Asia and North Africa to share best practices, resources, and training opportunities. Such collaboration could bridge the digitalization gap between regions and create a more unified approach to decolonizing archaeology in the MENA region.

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MICMAH ICOM International Committee for Museums and Collections of Archaeology and History

Becoming an Archaeologist: Exploring Archaeology through a Digital Immersive Campus

Chung-Chun Wang

National Museum of Prehistory, Taiwan
ccwang@nmp.gov.tw

- **Abstract**

The digitization of museums has become a trend, the pandemic has accelerated this transformation. This article takes an e-learning website planned by National Museum of Prehistory in Taiwan as an example, which created and designed a 3D immersive campus online, setting up the fields including archaeological sites, laboratories, museums, and adopting the concepts of role-play game and education simulation game, attempt to attract and raise up the interest of school children to explore the world of archaeology, and can even get closer to it. On the other hand, the general website interface designed several functions for the public to share their ideas, or check in at an archaeological site and leave a comment, browsing digital exhibitions or 3D collections via the internet, making online interaction and discussion possible.

Through the above ideas, we can discover that digital resources can become a powerful tool for informal learning, and can also make up for the shortcomings of archaeology that are often absent or less in formal learning. Thereby, expanding the boundaries of museums, strengthening their multiple functions of public services, and enhancing the accessibility and friendliness which can furthermore, embracing different types of groups to learn, experience, and communicate in the museum.

Keywords: public archaeology; museum education; digitization; e-learning; informal learning

- **Introduction**

In the context of ongoing technological advancements, the functions of museums have evolved accordingly. At the 2022 ICOM (International Council of Museums) General Conference in Prague, a new definition of museums was adopted, emphasizing the role of museums in being open to the public, promoting accessibility, emphasizing community engagement, and offering varied experiences for education, enjoyment, reflection and knowledge sharing (ICOM 2022). Contemporary technological innovations and the use of digital media have not only enhanced the display and visitor experience in museums but have also transcended the physical limitations of museum spaces, extending their services and reach. The onset of the COVID-19 pandemic in 2020 further accelerated the adoption and transformation of digital applications in the museum sector.

Located in eastern Taiwan, the National Museum of Prehistory (hereafter referred to as "NMP") is a national museum focused on archaeology. It was established following the discovery of rich archaeological remains at the Peinan site during the construction of the new Taitung railway station. After years of excavation, the decision was made to protect the site by creating a site park at the original location and building a museum nearby to further collect and display the unearthed artifacts, as well as to present the prehistoric development of Taiwan. Since its official opening in 2002, the museum has been in operation for nearly two decades. In 2020, it closed for comprehensive renovations to update both the building and its exhibitions, and it reopened in May 2023.

Due to Taiwan's small geographic size and dense population, most people reside in the western part of the island. In contrast, the eastern region is geographically more isolated and faces challenges in transportation infrastructure, which contributes to the relatively low accessibility of the NMP. As a result, its visitor numbers are far fewer than those of other national museums, with the majority of visitors concentrated around the Lunar New Year and school holiday periods, limiting the breadth and frequency of audience engagement. The global pandemic has had a profound impact on museum operations. Despite the ongoing renovations of the main museum, the Tainan branch and the archaeological site park were still affected, experiencing significant declines in visitor numbers and requiring strict crowd control and health measures during events. During this period, the Ministry of Culture launched the "Smart Upgrade Program for Museums," aimed at introducing emerging technologies to enhance museum's services in exhibition, collection, education, and other areas,

creating new possibilities. In this context, the NMP developed an e-earning and immersive experience platform—a website designed to offer the public an alternative way to explore archaeology.

This paper will explore the "Taiwan Prehistoric Culture Digital Campus" website constructed by the NMP, detailing the website's structure, planning, and design, while discussing the underlying conceptual framework. Through game-based learning and immersive experiences, the website aims to popularize and share archaeological knowledge. The establishment of this website responds to the new definition of museums, significantly expanding the museum's reach and services, and overcoming the limitations posed by its location in eastern Taiwan. Moreover, it will demonstrate that gamified learning methods can serve as an accessible entry point to academic knowledge, lowering the barriers to understanding professional concepts. This paper will first present a case study on the planning of the "Taiwan Prehistoric Culture Digital Campus," followed by a discussion of how its details enhance and augment museum functions. Finally, a conclusion will be drawn regarding the contributions of the case and its future prospects.

- ## The Taiwan Prehistoric Culture Digital Campus: Exploring the Past Through the Eyes of an Archaeologist

During the initial planning phase, we defined the website's purpose as a resource integration hub, aimed at consolidating and linking various resources from different websites to facilitate user search. As such, we integrated resources including the NMP's "Heritage Inquiry Information System," the "3D Database of Archaeology," the Ministry of Culture's Bureau of Cultural Heritage's "National Cultural Heritage Database," and the "National Archaeological Site Excavation Artifacts Collection System," among others.

At the same time, to cater to the user experience of different groups, we designed different browsing experiences for the same content: a standard web version and an immersive web version. A standard web version typically follows conventional browsing formats, such as text and image layouts, paired with simple graphic design. In contrast, the immersive learning park version is tailored for a target audience ranging from elementary to middle school students. Therefore, its interface is designed to be fun and engaging, with a lively style. The following section will focus primarily on the immersive learning park version, providing an overview of its planning concepts and key design details.

A. Style Design

To attract a younger audience, the design style is centered around cute, playful elements such as LEGO blocks and building bricks. The color scheme is intentionally vibrant to capture attention. Since the initial plan does not include the development of a mobile app, the website is designed to integrate both versions (standard and immersive) using a web-based approach. To optimize loading speeds and avoid slow page performance, the homepage utilizes 3D graphics, while the interior pages are presented in 2D with a 3D-like effect.

The homepage features an immersive campus scene that combines actual architecture with local landmarks from Taitung. The design draws inspiration from various thematic architectural styles, each reflecting a unique aspect of the museum and its surroundings. For example, the library is designed as an open book (Figure 1), the train tunnel is depicted as an overturned pottery vessel (Figure 2), and a local elementary school in Taitung, with its Mediterranean-style architecture, is used as a classroom setting. Additionally, the prehistoric crescent-shaped stone pillars from the Peinan site are incorporated as a landmark (Figure 3). These creative elements not only enhance the visual appeal but also create an engaging, context-rich experience for the visitors.

Figure 1: The library building is designed as an open book.

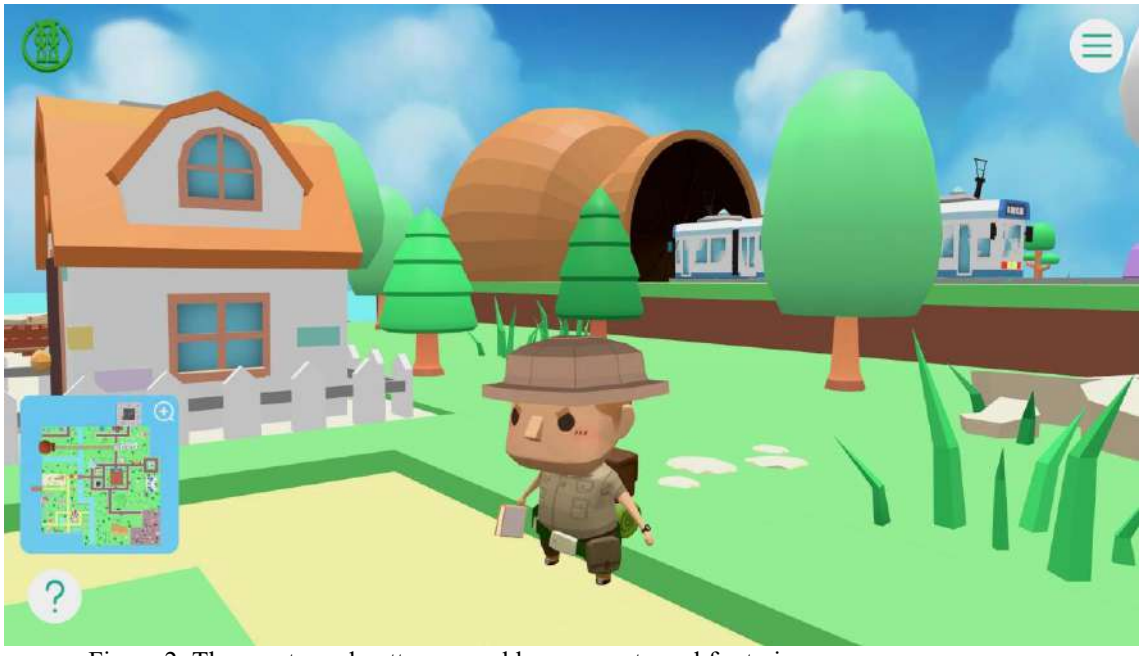

Figure 2: The overturned pottery vessel becomes a tunnel for train passage.

Figure 3: The blue-and-white Mediterranean-style Fengli Elementary School, a distinctive landmark in Taitung, is incorporated into the scene, along with the crescent-shaped stone pillars from the Peinan archaeological site.

B. Scene Setting

The scene is set in a digital campus with a core theme of archaeology. Several exploratory areas are designed within the campus, and the content is organized accordingly into various sections, including: "News," "Museum," "Library," "Laboratory," "Classroom," "Activity Center," and "Prehistoric Sites" (Figure 4).

The "News" section is designed as a bulletin board to present updates on the latest archaeological research, excavation findings, and exhibitions related to archaeology, including new exhibition openings (Figure 5). The "Museum" section recreates three spaces: the exhibition hall, special exhibition gallery, and the collection storage room. The exhibition hall features a 360-degree virtual tour of the Taiwan Prehistory Hall from the National Museum of Prehistory, combining both virtual and physical display spaces, allowing users to visit online. The special exhibition gallery is modeled after an actual exhibition area, where the text, images, and artifact displays can be updated according to the theme of the current exhibition (Figure 6). The collection storage room is designed based on real-life settings and integrates the "Heritage Inquiry Information System," and the "3D Database of Archaeology," enabling users to explore artifacts, which include images, 3D models, and interpretive information in a unified format.

The "Library" section incorporates entries related to archaeology from the Ministry of Culture's "Taiwan Encyclopedia," as well as the museum's newsletters, journals, and excavation reports. These resources are interconnected, allowing for cross-referencing and strengthening the database's horizontal integration, particularly within the "Prehistoric Sites" section.

In the "Laboratory", themed spaces are set up for "Composition Analysis," "Phytoliths," and "3D" experiments. In addition to introducing the equipment and procedures used in these analyses, raw experimental data is made publicly available (also accessible on the standard web version), allowing interested researchers to access and utilize this data. The "Classroom" serves as the foundational space for browsing, focusing on providing basic archaeological concepts, such as explaining research methodologies and the steps involved in archaeological fieldwork.

The "Activity Center" features two games. The main idea and storyline of one game is based on the tasks and tools used in archaeological fieldwork, while the other, developed in collaboration with the original illustrator SINKCOMIC, involves an interactive game featuring the museum's IP characters in a "Where's Wally?" style. By identifying the character, users can learn more about the tasks performed by that character in the archaeological field.

The digital campus also includes three "Prehistoric Site" areas, designed based on the Peinan, Chiuhsianglan, and Blihun Hanpen sites. Each includes an introduction to the site, unearthed artifacts, and

references with all data interconnected with the “Collections Storage” and “Library” sections mentioned earlier (Figure 7).

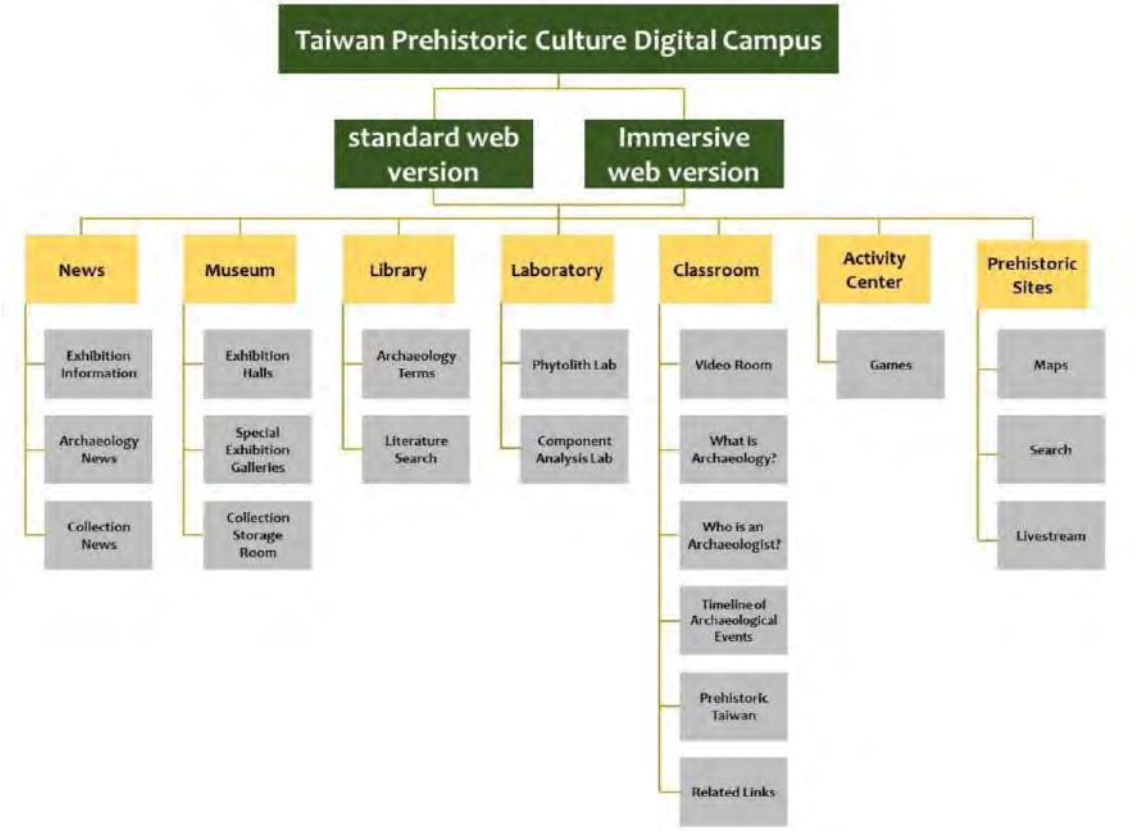

Figure 4: Website architecture diagram

Figure 5: The bulletin board format is used to showcase the latest archaeological news.

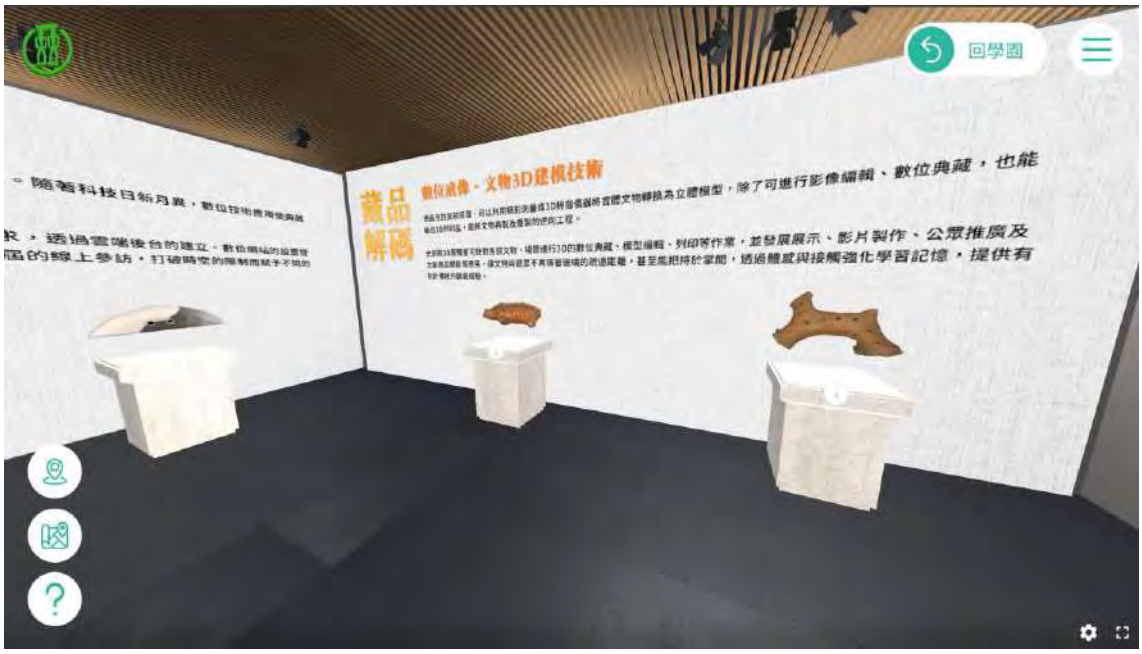

Figure 6: The virtual space of the “Special Exhibition Gallery,” where wall texts and display items can be updated.

Figure 7: The design concept of one “Prehistoric Site” is based on the Chiuhsianglan site.

C. Learning Points

Inspired by the concept of a “progression game,” we designed a system for earning learning points. Each action taken on the website can earn different amounts of points. For example, simply logging in grants 1 point, writing a learning note earns 5 points, and watching a video rewards 5 points, among other actions. As users accumulate points, they can reflect in character upgrades, as well as the unlocking of cards in the archaeological tools catalog (Figure 8).

Figure 8: Acquiring learning points can level up the character.

D. Character Design

In line with the concept of a "progression game," character design plays a crucial role. As an educational website aimed at promoting archaeology, the central character is an archaeologist, allowing users to navigate the digital campus through a virtual character and explore archaeological knowledge.

Users can choose between male or female characters, with six different outfits available. As they accumulate learning points, they can unlock various items that the character can hold, such as a notebook and a trowel, providing users with the fun of customizing their character.

Along with the learning points system, characters can level up and transition into more professional roles. The starting character is an archaeology intern. After accumulating 500 points, the character can be upgraded to an archaeology graduate student. Finally, upon reaching 1500 points, the character becomes an archaeologist.

As the character's status increases, the available items they can hold also change. For instance, the archaeology intern can only carry a notebook, while the archaeology graduate student has access to additional items like a trowel and a camera. As the character reaches the level of archaeologist, they can carry even more advanced tools, such as a pickaxe, a ranging pole, and a spade, alongside the previously unlocked items.

E. Archaeological Tools Catalog

We also designed an Archaeological Tools Catalog (Figure 9), where users can unlock cards as their learning points increase, allowing them to collect the tools gradually. The catalog includes a total of 65 different tools, covering those used in outdoor fieldwork, indoor conservation tasks, and artifact restoration.

The catalog features common fieldwork tools such as a ranging pole, trowel, total station, hoe, brush, line level, sunshade, soil color chart, and excavation record forms. It also includes indoor conservation tools like Paraloid B-72 for artifact restoration, 3D scanners, and acid-free packaging materials. These tools are presented in the catalog to provide users with a comprehensive understanding of the various instruments used in archaeological practices.

Figure 9: Unlock the tool cards, and can read the descriptions to understand their use in archaeological work.

F. Archaeological Notebook

In this digital campus, we also aim for users to engage more deeply than just browsing. We encourage them to observe, reflect, explore further, and take note of their thoughts. To achieve this, we designed the "Archaeological Notebook."

In the notebook, users can add items or topics of interest after browsing artifacts or reading the latest archaeological news. They can then write observational notes, reflecting on their learning. Users also have the option to make their entries public, sharing their insights with others.

Additionally, when visiting archaeological sites, users can take photos and check in at the location. These photos and notes can be uploaded to the notebook, transforming it into a tool for documenting site visits, much like a field journal used by archaeologists during excavation work. This feature enhances the immersive experience, allowing users to engage in the field research process and record their own archaeological observations.

G. Learning Progress

In the digital campus, all browsing activities and learning progress are recorded. In addition to displaying the current character level and learning points, users can also review their completed records, such as the number of artifacts collected and the number of reflection notes written. Furthermore, users have the option to generate learning certificates, serving as a recognition of their achievements.

Through the various design and settings mentioned above, users can engage in an immersive experience within this digital campus, exploring and browsing content. They can further enhance their learning by independently recording reflections and interacting with the public by sharing their notes. In addition to the virtual digital environment, offline physical elements are also integrated, such as the ability to check in at archaeological sites. This feature allows the digital space to intersect with real-life experiences, creating a mutually beneficial relationship between the two.

- **Discussions**

The functions of museums evolve in tandem with societal developments, and for archaeologists working in museums, one of the most important responsibilities is bridging the gap between academia and the public. They are tasked with interpreting and translating research findings for wider audiences. How to use exhibits to tell stories and how to inspire public interest in archaeological research through outreach activities are key goals of public archaeology in museums. Under this core mission, it becomes crucial to leverage technology and integrate concepts from various disciplines (such as education) to achieve these objectives—an important duty for professionals in the field of archaeology.

With the rapid advancement of technology, digital applications in museums have become increasingly sophisticated. Whether it's basic online exhibitions, 360-degree virtual displays, or even podcast production, museums now utilize a variety of platforms to promote their content. The application of 3D technology has also assisted in artifact restoration and exhibition, significantly enhancing the functions and potential of museums. The key challenge lies in how to integrate these technological resources and digital media to shape

them into a medium for public engagement with archaeology. This is the central purpose behind the development of the "Taiwan Prehistoric Culture Digital Campus."

A. The Digital Campus as a Resource for Informal Learning

Compared to formal (school-based) learning, which is typically teacher-driven, museum learning is more self-directed (Chen 2003; Li 1997). Unlike traditional assessments, museums provide resources and opportunities for autonomous exploration (Kratz & Merritt 2011). In Taiwan's educational environment, there is often a strong focus on formal academic subjects, with limited emphasis on fields such as archaeology in recent curricula. The challenge, then, is how to provide access to archaeological topics within these core subjects, and in doing so, enhance students' understanding and interest in archaeology. One effective approach is through a game-like, easily accessible website that encourages engagement. Moreover, there are no assessments or failure mechanisms in place; instead, the system utilizes motivational learning points to reduce apprehension about engaging with unfamiliar academic fields and to make the entry process more approachable.

By leveraging this digital campus, content can be disseminated widely via the internet, increasing the efficiency of academic outreach and expanding its reach. As part of informal learning, the digital campus offers a more flexible and self-directed path for acquiring knowledge, allowing users to explore according to their own objectives and pace.

At the same time, by integrating digital applications and technological advancements into the museum's many physical functions, the content, experiences, and services can achieve a seamless integration of the virtual and the physical. This expands the museum's functions and breaks through the limitations of its physical boundaries, aiding its transformation and supporting its expansion as a platform for informal learning and continuing education.

B. Digital Platforms for Promoting Cultural Equity

In the past, participation in cultural activities and the accumulation of cultural capital were privileges largely reserved for the elite. However, as time has passed and with increasing emphasis on human rights, the idea of universal participation in and sharing of cultural life has become a mainstream advocacy, and the policy is also gradually shifting from exclusion to inclusion. This includes accommodating diverse groups and actively providing access to cultural resources. Taiwan's Cultural Fundamental Act (2019) outlines key elements of cultural equity, such as expanding cultural participation, emphasizing the significance of multiculturalism and cultural diversity, ensuring equal cultural rights for all groups, and actively providing cultural resources, communication, promotion, and preservation. Museums, as public spaces, have also been involved in these efforts, striving to plan and improve practices for cultural equity.

The digital campus built for this project specifically targets the youth and adolescent demographic. This design decision arises from the fact that, while the NMP's audience generally includes the public, the focus is often on adults, particularly those in high school and above, with less attention given to younger audiences. In addition to providing accessible resources for participation, digital platforms lower barriers to entry, such as the physical accessibility limitations of the NMP itself. A key concern of this project is how to attract and maintain the interest of children. Through strategies like accumulating learning points and character upgrades, children are encouraged to continue exploring and learning.

In addition to promoting independent exploration among children, teachers can also utilize the materials on this platform as supplementary educational resources. For example, in the standard website interface, a special section for teachers has been created, containing resources such as board games, lesson plans, and worksheets, which can be downloaded or borrowed. This integration of online and offline resources enhances the overall effectiveness of the learning experience. Moreover, we have introduced this digital learning resource to the Department of Digital Media and Education Industry at National Taitung University, allowing future educators to familiarize themselves with the platform and use it as a tool to support their teaching.

C. Constructing Game-Based Learning to Deliver Knowledge

Compared to the one-way knowledge transmission in traditional classrooms, more engaging game-based methods can better stimulate participants' learning motivation, encouraging them to take an active role in their learning and deepening their learning experiences through the integration of fun and education (Teed 2004; Prensky 2007). Additionally, immersive environments, along with rules that include challenges or rewards, can further enhance users' motivation to learn (Whitton 2011). Beyond entertainment, games can serve as a learning tool that facilitates deep learning while allowing exploration in a relatively relaxed atmosphere (Kiili 2005; Yang 2012).

Although the digital campus is not a pure game, as it is primarily structured as a database with a character-based navigation system, it incorporates the principles of game-based experiential learning. The design includes challenges and goal achievement elements to create a sense of accomplishment (Kiili, 2005). Features such as learning points and character leveling are integrated into the design to stimulate users' intrinsic motivation for active learning.

Conclusion

The functions of museums have evolved in tandem with societal dynamics, and the impact of the COVID-19 pandemic has further expanded the role of digital applications. This paper uses the design concept of the Taiwan Prehistoric Culture Digital Campus as a case study to illustrate how immersive and game-based learning design not only promotes autonomous exploration and learning through an engaging, playful approach, but also motivates users through systems such as learning points and progression game. Furthermore, various design elements enhance the appeal of knowledge exploration, such as the use of Archaeological Tools Catalog, which accumulate learning points. Upon collecting these cards, users can read detailed descriptions to understand the tools' applications in archaeological research.

Museums are rich in resources, and as venues for the intersection of academic and public engagement, they can be further developed with the aid of digital media. By presenting academic knowledge in diverse interpretive formats, museums can overcome spatial and temporal limitations, reaching a broader audience and advancing the concepts of cultural equity and accessibility.

Looking ahead, the integration of online and offline experiences will undoubtedly become a key direction for development. The website created for this project is continually promoted to school teachers at various events, and there are plans to produce cultural and creative products based on characters and scenes from the digital campus. Additionally, the project intends to collaborate with children's archaeology camps, allowing the digital campus to be integrated into physical activities, creating a mutually reinforcing value between the virtual and the real.

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