**Special Issue for 3rd International Conference on Information Literacy**
**Issue 73, December 2024**
DOI: 10.70000/cj.2024.73.625

Cybrarians Journal
E-ISSN 1687-2215

# Digital transformation at the Grand Egyptian Museum

Articles – Full text

**Dr. Nancy Ali**
Director of Innovation, Legacy Co. Operator of the Grand Egyptian Museum, Egypt
nancyali@gmail.com
nancy.ali@hassanallam.com

**Ayman El-Sayed**
Head of Learning and Outreach Programs, Legacy Co. Operator of the Grand Egyptian Museum, Egypt
a.m.elsayed@gmail.com
ayman.melsayed@hassanallam.com

**Amr Abdel Nasser**
Strategic Planning & Temporary Exhibitions Manager, Legacy Co. Operator of the Grand Egyptian Museum, Egypt
amrabdelnasser@gmail.com
Amr.Abdelnasser@Hassanallam.com



**Abstract**

The Grand Egyptian Museum (GEM) represents a transformative addition to Egypt's cultural and heritage landscape, set to redefine the traditional museum experience through immersive, interactive, and technology-driven exhibits. As the largest museum globally dedicated to ancient Egypt, the GEM aspires to inspire future generations, fostering creativity and innovation while addressing the scarcity of cultural institutions in Egypt. Its extensive collection spans over 700,000 years, featuring thematic exhibits that narrate the evolution of Egyptian society, religion, and governance.

The GEM is pioneering digital integration in tourism, introducing virtual and augmented reality experiences, online tours, and cashless systems to enhance visitor engagement and accessibility. These advancements, alongside initiatives like the Children's Museum, leverage gamification and STEM-focused programs to captivate younger audiences, making learning both entertaining and impactful. The museum's

dedication to fostering curiosity and critical thinking is evident in its innovative approaches to education and heritage interpretation.

Temporary exhibitions, such as the immersive Tutankhamun showcase, demonstrate GEM's commitment to merging technology with cultural storytelling. By employing cutting-edge tools like digital projection mapping and AI art, the museum creates multi-layered, inclusive experiences that engage diverse audiences while advancing scientific research and scholarly collaboration.

The GEM is poised not only to be a cultural hub but also a global benchmark for integrating heritage, education, and technology. Its multifaceted approach ensures relevance for contemporary audiences and secures its role in shaping the future of cultural tourism and learning.

**Keywords**
Digital transformation, cultural heritage, Grand Egyptian Museum

## Introduction

The Grand Egyptian Museum will be the first of its kind in Egypt, looking to break the boundaries of the traditional museum by providing an all-encompassing engaging and interactive experience.

A cultural platform and destination, the GEM is vested in inspiring future generations and helping to cultivate a thriving creative landscape in Egypt, particularly important given the scarcity of cultural institutes in the local ecosystem. Worldwide, the GEM is bound to be the biggest addition to the heritage landscape.

Currently, the GEM is gearing up to welcome visitors this year, generating excitement both locally and globally as it prepares to become the largest museum dedicated to ancient Egypt. As Egypt's first museum of its kind, GEM aims to revolutionize the traditional museum experience with engaging and interactive exhibits. The GEM aspires to be a cultural platform and destination that inspires future generations and fosters a thriving creative landscape in Egypt.

## The GEM Collection


DOI: 10.70000/cj.2024.73.625

The Grand Egyptian Museum (GEM) is set to be the largest museum in the world dedicated to the people, history, culture, and beliefs of Ancient Egypt. Its extensive collection spans over 700,000 years, from the Prehistoric Period to the end of the Roman Empire in Egypt.

The museum's unique curation is organized by themes and trails, offering visitors a narrative journey through ancient Egyptian life, kingship, and beliefs. The Grand Hall, with its colossal statues, and the Grand Staircase, which explores the royal journey from public representation to the afterlife, are central features. The Main Galleries, located at the top of the Grand Staircase, cover the evolution of Egyptian society, kingship, and religious beliefs across 18,000 square meters. These exhibits provide an immersive experience, showcasing the unification of Upper and Lower Egypt, the rise of royal authority, and the spiritual world of gods and goddesses, with artifacts that reveal the innovations and influences that shaped this enduring civilization.

Additionally, the museum is home to the expansive Tutankhamun Galleries, where over 6,000 artifacts from the boy king's tomb are displayed, many for the first time. This 7,500-square-meter exhibition offers a detailed narrative of Tutankhamun's life and legacy, divided into themes such as Identity, Lifestyle, Funeral, Rebirth, and Tomb Discovery. The GEM's dedication to storytelling is evident throughout, with exhibits designed to connect the past with the present in ways that are relevant and accessible to modern visitors.

**Egypt Going Digital**

The Grand Egyptian Museum (GEM) is at the forefront of Egypt's digital transformation in the tourism sector, serving as a key player in the country's efforts to modernize and streamline the tourist experience. Situated just feet from the iconic Giza Plateau and conveniently close to the Sphinx International Airport, the GEM is positioned as a launchpad for visitors to explore the rest of Egypt in a seamless, technology-driven manner. As part of this transformation, Egypt is moving towards a cashless, fully online booking system that enhances convenience and efficiency for tourists. The GEM leverages advanced technology


DOI: 10.70000/cj.2024.73.625

not only to streamline visitor experiences but also to reinvigorate the heritage sector by making it more accessible and engaging, particularly for younger generations—a demographic that museums globally struggle to attract. Through innovative content and digital tools, the GEM is helping to redefine Egypt's cultural tourism, ensuring that it remains a vibrant and integral part of the country's future.

At the GEM, a range of digital activations is being developed to create an immersive and engaging environment for visitors. This includes 3D itineraries for literary, artistic, scientific, and musical events, which allow visitors to engage with content in an entirely new way. Digital storytelling, interactive installations, and historical visualizations through maps and timelines will significantly enhance the educational experience. Visitors will be able to explore 3D reconstructions and interactive scans of artifacts, providing deeper context and re-imagining missing parts of these ancient treasures. The museum s immersive halls will feature AR, VR, and mixed reality experiences that bring Egypt's rich heritage to life, including a VR festival or hackathon centered on ancient Egypt and King Tutankhamun, poised to attract significant crowds.

The introduction of virtual and augmented reality technologies at GEM aligns with global trends in museums and cultural heritage sites, where these tools are increasingly used to enhance visitor experiences, improve learning outcomes, and boost overall satisfaction. Virtual reality immerses users in computer-generated worlds, offering significant educational potential and providing opportunities for virtual tours and interactive exhibits (Bachiller et al, 2). Augmented reality, on the other hand, overlays virtual elements onto the real world in real time, enhancing real-world experiences with additional content and providing interactive and educational experiences that improve visitor engagement (Bachiller et al, 3).

Additionally, the GEM is expanding its reach to online audiences through VR walkthrough" tours of the museum and monuments, digital collections, and premium online offerings such as members-only events and virtual galas. Revenue-generating online interactions will include masterclasses,


DOI: 10.70000/cj.2024.73.625

conversations with Egyptologists and curators, and exclusive behind-the-scenes content, ensuring that the museum remains a dynamic hub for cultural engagement both on-site and online. This approach not only draws in the younger demographic, who make up a significant portion of Egypt's population, but also sets a new standard for museums worldwide in tapping into this challenging yet crucial audience.

**Using Technology to Draw in the Young**

At the heart of the GEM is the Children's Museum, a tailored space for children to explore the themes and stories of Ancient Egypt in a novel and engaging learning adventure. This experiential journey takes children back into time using tech-based edutainment and gamification. Its interactive environment allows children to choose the way they want to learn, and engages cognitives, social, emotional development.

Ground-breaking facilities such as the Children s museum promote learning outside the classroom, by offering real-world immersion in the world of Egyptology. New media such as interactive maps and timelines or edutainment activities, and new technologies such AR and VR immersive experiences augment the user experience of our youngest visitors. The learning center focuses on children's STEM education programs designed around Ancient Egyptian themes (coding, digital media, robotics, engineering, business basics, smart). A digital learning center allows children to play fun and interactive games as they learn.

At the GEM, we are harnessing technology to discover new methods for interpreting history and sharing it with our visitors. This approach allows us to re-envision our past and heritage, and provides a unique perspective for Egyptians to connect with their own history. It is sure to instill a sense of pride in the people of this land, and to reignite interest in ancient Egyptian culture among younger generations.

**On Children's Museums**


DOI: 10.70000/cj.2024.73.625

Museums now are considering children and youth as a main category of the community. In a country like Egypt, as published by Central Agency for Public Mobilization and Statistics, kids under 15 years old represents 34% of the community. As a main segment of the society, museums management put it as a priority to include programs and exhibitions that target this massive audience (McRainey and Russick, 2010). Added experiences need to include multiple cognitive and physical components, which represents a critical thinking approach that is important to attract this age category (Stewart 2014; E Phon and Ali 2014).

Augmenting the museum experience with innovative components is a crucial need for the young visitors. Technological solutions in museums help to move the learning process to be customer centric, as fulfilling their needs to learn from the objects, rather than to be an object-centric, and focusing only about the objects themselves ((Hawkey 2004). Using such approach help to attract young audience, whom are not that much interested of old museums.

Museums that change their offerings to these age categories, and add innovative components, such as simulation and immersive experiences, are able to enlarging the categories that are interested in their programs. Experiences similar to the one at the Metropolitan Museum of Art in New York City, where part of their art collections are displayed virtually in an interactive game, are attracting young visitors much better than any other techniques that are applied to improve a physical display.

On the other hand, involving Games within museums offering is so interesting for younger visitors. Having challenging activities help museums to enrich learning and involvement (Stewart 2014). Gaming in museums support experiential learning, which involve using all visitor senses, which increase motivation and interest, mainly for kids, and make the learning environment in the museums totally different, and more attractive, than formal environment in schools (Behrendt and Franklin 2014).


DOI: 10.70000/cj.2024.73.625

**The Children's Museum at the GEM**

The Children s Museum at the Grand Egyptian Museum is devoted to sparking a child s passion about ancient Egyptian culture. It is created as a safe, loving, welcoming, and imaginative environment for learning and playing. This interactive environment allows children to choose the way they learn best, fostering cognitive, social, emotional, and physical development in all areas of the museum space.

At the Children s Museum, children are engaged in a memorable learning experience, utilizing their curiosity to explore, their urge to find out how things work, and why things happen the way they do. Just like archeologists and historians, children are interested in exploring sources and reasons for anything they see in their environment, and we tap into this through playing and entertainment. The vision of the GEM Children s Museum at the Grand Egyptian Museum is to inspire future generations while instilling in them the interest in Ancient Egyptian Civilization.

Learning and programs at the GEM have an overall mission, to connect new generations with the great ancient Egyptian history, applying future sciences, with a connection to local and global recent topics. Programs focus on encouraging participants to be introduced to the great history of Egypt, get introduced to the challenges of the local community, and how they can be a part of their solutions, which needs them to acquire new generations with modern mental skills and conceptual understanding.

With an objective to offer exceptional experience, one of main objectives of the GEM is to provide exceptional and personalized visitor service that creates a welcoming and informative atmosphere for all guests, exceeding their expectations and fostering a lasting relationship. Coping with a customer-centric approach, it s highly needed to understand their needs and objectives, and provide customized solutions that meet and exceed their expectations and desired outcomes.


DOI: 10.70000/cj.2024.73.625

From this perspective, operating learning programs at the GEM needs to be oriented to the needs of new generations, their way of thinking, their priorities, and fields they focus on to approach for both education and career tracks.

**Technology as a Supporting Learning Tool**

Modern technologies have been a topic of discussion in museums for some time. This type of modern learning, including robotics, programming, simulation techniques, and much more. It gives students a unique combination of challenges and practical experiences that are adapted to their particular level. When students are challenged at just the right level, they become involved in a step-by-step development process, in which each step encourages them to continue to the next. This is how children are motivated.

As technology is becoming increasingly important in today's world, it is valuable to learn how to use it, and understand how to create it. Technology is the future of our country; developing and inventing new technologies is the easy path to creating opportunities and opening new horizons for the new generation. Being technology producers and not only consumers is the corner stone of securing sustainable development on the national and regional levels.

It s highly considered that young students should be exposed to hands-on math, science, and engineering at a young age. Robotics, computer studies, and programing introduce young students to engineering and motivate them to be involved in creating future technology. Learning through playing is valuable in that children embrace it for what it is, regardless of their age, gender, culture, and ethnicity. Creativity also supports critical thinking, sparks curiosity, and facilitates learning by doing, which are important lifelong competences necessary for children s development. Learning technology at an early age encourages the youth to indulge in research at an early age and pursue their studies and career in science and engineering. In addition, robotics allows young students to develop invaluable inter-personal skills like problem-solving, logical reasoning, critical thinking and creativity. These skills are highly desirable for children who will succeed as leaders and developers of the future.


DOI: 10.70000/cj.2024.73.625

**Temporary Exhibitions at the GEM**

Temporary exhibitions have become a pillar of contemporary museum practice. Historically, museums primarily focused on maintaining permanent collections that were curated to reflect the mission of the institution, often emphasizing a particular period, culture, or theme. However, the rigid nature of permanent collections limited the museum s ability to adapt to changing socio-cultural contexts and visitor expectations.

The concept of temporary exhibitions emerged as a solution to this challenge. By offering limited duration shows, museums were able experiment with different thematic approaches, highlight lesser-known artifacts, and engage with current events or scholarly production. Temporary exhibitions also provided an opportunity for museums to collaborate with other institutions, artists, and scholars, resulting in a richer and more diverse offering for visitors.

One of the most significant impacts of innovation and technology in the field of heritage management is observed in the development and execution of temporary exhibitions. The use of technological tools not only enhances the visitor experience but also offers new ways to interpret and present heritage, making it more accessible to a broader audience.

**Case study: The Immersive Exhibition**

A compelling example of the intersection of technology and heritage management is the Tutankhamun immersive exhibition, which was presented at the Grand Egyptian Museum. This exhibition utilized cutting-edge technology to bring the story of the young king and his world to life, in an unprecedented way in the museum s setting.

One of the most notable aspects of the exhibition was its use of digital projection mapping, which transformed a regular corridor within the museum into a dynamic environment that shifted from the richness of the Egyptian Nile Valley to the chambers of the tomb and reconstructed ancient architectural spectacles. This technology created an immersive narrative that captivated visitors and


DOI: 10.70000/cj.2024.73.625

provided a deeper understanding of the historical context of Tutankhamun's time and world.

The immersive exhibition was designed to cater to a varied range of audiences, engaging visitors of all ages and backgrounds through tailored elements within the exhibition. For younger audiences, particularly children, the dynamic floor projections featuring animated figures running across ancient landscapes captured their imagination, providing an element of play and wonder that made the experience memorable. Teenagers, accustomed to social media trends, found the exhibition's "Instagrammable" moments particularly exciting, offering opportunities for social sharing and engagement. Meanwhile, adults were drawn to the exhibition's scenic journey over the Nile and the reconstructions of temples. Scholars and specialists, however, were more focused on the exhibition's content and details, appreciating the depth of research and the accuracy of the historical representations. This multi-layered approach, only attainable through digital exhibitions, ensured that the exhibition resonated with a broad spectrum of visitors, making it not only an educational experience but also a culturally enriching one that appealed to diverse interests and varied levels of expertise.

**Temporary Exhibitions and Scientific research**

In addition to serving as a platform for innovative storytelling and facilitating the dissemination of knowledge, temporary exhibitions hold the potential to stimulate further scientific research by engaging the public in compelling ways.

One of the most promising areas where temporary exhibitions can influence scientific research is through the use of AI art. These technologies have become increasingly popular in digital exhibitions, offering new methods for interpreting and presenting data that can challenge traditional academic perspectives.

AI art can introduce an entirely new dimension to the interpretation of ancient knowledge. By using algorithms to analyze and reinterpret primary sources, AI art can generate new insights that are free from the biases of contemporary scholarly thought. This process involves feeding large datasets into machine learning models, which then produce visual representations based on patterns


DOI: 10.70000/cj.2024.73.625

identified within the data sets. For example, AI could be used to analyze ancient texts or artworks, identifying recurring themes or motifs that may have been overlooked by human researchers. The resulting AI-generated art can serve as both a reinterpretation of historical data and a catalyst for new lines of inquiry, prompting scholars to revisit and reassess their interpretations of the past.

These technologies enable a more dynamic presentation of historical content, which a broader audience can better relate to. By presenting ancient data in a way that is visually engaging and intellectually stimulating, museums can encourage a deeper interest in the subject matter among its visitors, including those who may not have a background in the field. This, in turn, can lead to increased public support for research initiatives, including potential donors, policy makers as well as inspire new collaborations between museums, academic institutions, and technology companies.

This multidisciplinary approach serves a prime goal of museums by bringing together experts from different fields. These exhibitions can facilitate the exchange of ideas that might not occur in a traditional academic setting.

**The GEM Audio guide**

One of the important upgrades we want to do to the tourist experience is supplement the in person guided experience with the Audio guide. The audio guide for the Grand Egyptian Museum (GEM) is designed to offer an immersive, educational experience that enriches visitors' understanding of ancient Egypt. It will begin by providing an overview of the museum's purpose, architectural features, and key galleries, setting the stage with essential historical context on Egyptian civilization. Iconic artifacts like Tutankhamun's treasures will be highlighted, and thematic tours will explore specific aspects of Egyptian life, enhanced by interactive elements such as quizzes and augmented reality (AR). This multi-sensory approach allows visitors to engage more deeply with the exhibits, fostering personal connections and enabling a customizable experience that can cater to diverse audiences. The audio guide's design will ensure accessibility with multilingual support and additional resources, offering visitors


DOI: 10.70000/cj.2024.73.625

the flexibility to explore the museum from their own devices both on-site and at home.

As part of GEM's broader digital transformation, the audio guide integrates advanced technology to elevate the visitor experience. Through creative storytelling, the guide links artifacts with supplementary materials, comparative images, and multimedia content, allowing users to uncover hidden details and explore collections in greater depth. The inclusion of AR and VR elements further enhances the educational impact, allowing visitors to view artifacts in greater detail and re-imagine missing parts of these ancient treasures. Additionally, features like interactive wayfinding, which helps visitors navigate the museum efficiently, and the integration with the museum's e-commerce platform, personalize the experience and drive engagement with GEM's broader offerings.

The user-friendly interface of the audio guide will act as a seamless navigation tool, offering interactive features, language options, and accessibility elements like font adjustments and closed captioning. The interface is designed to be intuitive, allowing visitors to easily select specific exhibits, control audio playback, and access descriptive content with visuals. Regular updates and collaboration with experts will ensure that the guide remains accurate and engaging, while analytics from visitor interactions will provide insights to refine the user experience further.

In addition to its primary functions, the audio guide will feature a range of innovative add-ons to enhance visitor engagement. Curator-led talks, guided tours, and concise audio tracks keep content engaging, while interactive elements like quizzes, games, and treasure hunts with rewards such as gift shop vouchers encourage deeper participation. The guide will also connect directly to the museum s programming, offering links to current and upcoming events, audio tracks for temporary exhibits, and personalized recommendations based on visitor preferences. By integrating these features, the GEM audio guide not only enriches the visitor s connection to the museum but also extends the museum's reach beyond its physical location, fostering a dynamic and lasting engagement with Egypt's rich cultural heritage.


DOI: 10.70000/cj.2024.73.625

**A Shared Content Management System**

In the context of an audio guide for a museum like the Grand Egyptian Museum (GEM), the Content Management System (CMS) plays a crucial role in organizing, storing, and delivering the content that visitors interact with during their museum experience. A CMS is a software platform that allows users to create, manage, and modify content on a digital platform without needing specialized technical knowledge. The CMS serves as the backbone for organizing the various types of content—audio tracks, images, text descriptions, multimedia elements—used in the audio guide. It allows museum staff to easily upload, edit, and update the content without needing to delve into complex coding.

One of the key benefits of a CMS is the ease of updating content. Museum curators and other staff can regularly update the audio guide with new information, correct inaccuracies, or add seasonal content without disrupting the visitor experience. This allows us to continuously upgrade the content with new exciting trails and themes.

Many CMS platforms offer built-in analytics tools that track how users interact with the content. This data can help museum administrators understand visitor preferences, which can inform future content updates and improve the overall user experience.

The development of a database that organizes the GEM collection ties into broader, strategic initiatives aimed at creating a unified national database for Egypt's museums. Such a database would facilitate the seamless integration and sharing of cultural assets across institutions, enhancing accessibility and collaborative opportunities. However, this ambition brings with it significant challenges related to safeguarding sensitive cultural data, ensuring the standardization of digital records, and navigating complex questions of data ownership.

As we explore the technical requirements for the CMS, we must also address the ethical considerations of managing and sharing cultural heritage information. This includes the protection of intellectual property, the need for rigorous security

 DOI: 10.70000/cj.2024.73.625

measures, and the responsibility of maintaining the accuracy and integrity of the data. By linking these technical aspects with the ethical imperatives, we can foster a more holistic approach to managing Egypt's cultural resources, ultimately supporting the preservation and promotion of its rich heritage in the digital age.

The ARCE (American Research Center in Egypt) Database Museums Project, particularly the Egyptian Museum Database Project, is an initiative aimed at modernizing the management and documentation of collections within the Egyptian Museum in Cairo. Launched with support from the Andrew W. Mellon Foundation and USAID, this project focused on digitizing the museum's vast collection and training museum staff in modern registrar practices. The project also aimed to improve the sustainability and accessibility of Egypt's cultural heritage through the development of a comprehensive digital database, making it easier for researchers and the public to access information about the museum's artifacts. The project reflects ARCE's broader commitment to preserving and promoting Egypt's cultural heritage through innovative technological solutions.

**The Audio guide: Accessibility and Inclusivity**

The audio guide at the Grand Egyptian Museum significantly enhances accessibility and inclusivity by addressing language barriers and catering to various visitor needs. It can be offered in multiple languages, including popular ones like English, Arabic, and French, as well as additional languages based on visitor demographics. This ensures that international visitors can access content in their native tongue. For those with hearing impairments, the audio guide could provide sign language options, closed captioning, or transcripts of the audio content, while visitors with visual impairments could benefit from audio descriptions that verbally explain the visual aspects of exhibits. Additionally, the interface can be designed to be compatible with screen readers, making navigation easier for all users. These features collectively ensure that every visitor, regardless of their background or abilities, can fully engage with and enjoy the museum's exhibits.


DOI: 10.70000/cj.2024.73.625

Inclusivity also means that we offer modes that cater to different demographics. Our plan for the audio guide include adding a mode for children. The audio guides designed for adults and children differ in content length, vocabulary complexity, and tone, with the children's version being shorter, simpler, and more playful. This approach allows for flexible family visits, where each member can choose the most suitable version based on their understanding and easily switch between them by selecting the corresponding item number. This adaptability enhances the overall experience, making it more engaging and accessible for children. (Gottesdiener and Vilatte, 3).

Furthermore, by allowing visitors to "listen from home", we open the collection of the GEM to a global audience and increase its reach. This transformation promises to increase the accessibility of the museum collection to a broader demographic, including visitors with disabilities, non-native speakers, and remote learners. Available web and app-based, audio guides can be used as a BYOD (Bring Your Own Device) by every visitor who can also access the audio content from home after their visit. Integrating features such as audio descriptions, transcripts, and multilingual support ensure the museum is inclusive for everyone.

**Engaging the Industry**

One of the significant challenges we face with the audio guide project is the potential backlash from the large community of tour guides who play a crucial role in shaping the tourist experience in Egypt. The tourism sector relies heavily on these guides, who often accompany tourists as part of operator-led packages. Introducing technology like audio guides can disrupt their traditional roles, leading to concerns about reduced footfall and income. However, this challenge also presents an opportunity to integrate tour guides into this technological revolution. By incorporating them into the digital platform, we can offer them new avenues for growth and income. Through our audio guide, which will be accessible both on-site and online, tour guides can reach a broader audience beyond physical visitors. They can create and share their own content, such as


DOI: 10.70000/cj.2024.73.625

podcasts or virtual tours, building a personal brand and following that isn t tied solely to the number of tourists they physically accompany. This approach not only mitigates potential disruption but also empowers tour guides to expand their influence and expertise in the digital realm, ensuring they remain a vital part of Egypt s tourism industry in the age of digital transformation.

**The Future of Audio guides**

The integration of an AI bot into the audio guide at the Grand Egyptian Museum represents a groundbreaking advancement in the application of large language models within Egyptology. This technology not only enriches the visitor experience by simulating the interactivity and expertise of an in-person guide, but it also opens new avenues for exploring and understanding Egypt's rich cultural heritage. The AI bot can engage visitors with personalized narratives, answer questions in real-time, and provide in-depth insights into artifacts, making the museum experience more dynamic and accessible. Moreover, this innovation showcases the potential of AI in academic research and public engagement, demonstrating how modern technology can bridge the gap between ancient history and contemporary learning, thus transforming the study and appreciation of Egyptology.

While the introduction of an AI bot to the audio guide offers exciting possibilities, it also presents significant challenges that must be carefully managed. One of the primary concerns is the potential for the AI to generate incorrect or misleading information, which could not only misinform visitors but also damage the museum's credibility. As the AI bot interacts directly with the public, any errors in the content it produces could lead to misunderstandings or propagate inaccuracies about Egypt's cultural heritage. This issue is particularly sensitive in a field like Egyptology, where precision and accuracy are paramount. Moreover, the museum could be held accountable for any misinformation disseminated by the AI, raising ethical and legal implications. To mitigate these risks, it will be crucial to implement rigorous oversight mechanisms, including regular updates, fact-checking processes, and human review of the AI's responses, ensuring that the technology enhances rather than detracts from the visitor experience.


DOI: 10.70000/cj.2024.73.625

The Centre Pompidou in Paris has implemented a cutting-edge AI-powered audio guide that not only provides information but also enhances visitor interaction through advanced features like image recognition. This AI audio guide allows visitors to take photos of artworks, which the system then recognizes, providing tailored information about the pieces as if the visitor had a personal tour guide. This innovative use of AI helps make the museum experience more personalized and engaging by allowing visitors to explore the art at their own pace, focusing on the pieces that interest them the most. The system is part of a broader trend where AI is increasingly being used in museums to create more interactive and immersive experiences (MuseumNext, Centre Pompidou Paris).

## Conclusion

For thousands of years, Egypt was the place to go for the latest and best technologies across the sciences and arts. A versatile Egyptian civilization gave our world its many firsts: The first plow. The first piece of paper, the first charm bracelet. From the world's first makeup contour to its first written history, Egyptian soil is ripe for innovation.

Today, at the Grand Egyptian Museum (GEM), we harness the power of technology to reimagine the past, organize our vast knowledge, and make our collections more accessible to the public. Our goal is to reestablish Egypt as a leader in the dialogue between heritage and technology, breathing new life into this sector in a country rich with cultural treasures.

## Bibliography

Bachiller, Carmen, Jose M. Monzo, and Beatriz Rey. "Augmented and Virtual Reality to Enhance the Didactical Experience of Technological Heritage Museums." *Applied Sciences* 13.6 (2023): 3539.

Behrendt, Marc, and Teresa Franklin. "A Review of Research on School Field Trips and Their Value in Education." *International Journal of Environmental and Science Education* 9.3 (2014): 235-245.

Dwyer, Christopher P., Michael J. Hogan, and Ian Stewart. "An Integrated Critical Thinking Framework for the 21st Century." *Thinking Skills and Creativity* 12 (2014): 43-52.

 DOI: 10.70000/cj.2024.73.625

Gottesdiener, Hana, and Jean-Christophe Vilatte. "The Use of Audio Guides in Museums." *Old Questions, New Answers: Quality Criteria* (2012): 1-18.

McRainey, D. Lynn, and John Russick, eds. *Connecting Kids to History with Museum Exhibitions*. Routledge, 2016.

Phon, Danakorn Nincarean Eh, Mohamad Bilal Ali, and Noor Dayana Abd Halim. "Collaborative Augmented Reality in Education: A Review." *2014 International Conference on Teaching and Learning in Computing and Engineering*. IEEE, 2014.


DOI: 10.70000/cj.2024.73.625