

# **OPPORTUNITY**

21

SCOPE

TRANSITIONAL

### **UNCERTAINTIES**

Technology, Values

### **MEGATRENDS**

**Digital Realities** 

#### **TRENDS**

Brain-Computer interfaces (BCI)
Culture & heritage
Extended Reality
Future of education
Immersive Technologies & Wearables

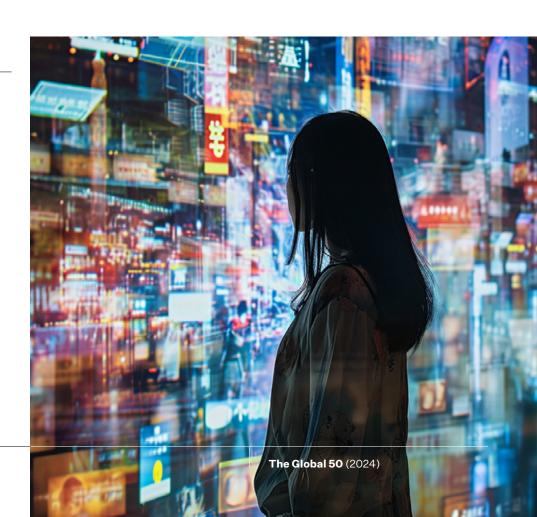
### **SECTORS IMPACTED**

Communication Technologies & Systems
Consumer Goods, Services & Retail
Data Science, Al & Machine Learning
Digital Goods & Services
Education
Government Services
Immersive Technologies
Art, Media & Entertainment
Professional Services
Sports
Travel & Tourism

# What if digital realities provided deep insights into history and culture?

# STEPPING THROUGH TIME

Digital realities enhanced by brain—computer interfaces change how we experience history and culture, providing real-time immersive insights into the development of communities and cities helping to enrich education and preserve cultural heritage.





### WHY IT MATTERS TODAY

Extended reality dates from the early 1800s and the original concept of binocular vision. <sup>511</sup> Fast forward to the 21st century. In 2016, Pokémon GO, an augmented reality (AR) game, enabled users to find and capture Pokémon in their surrounding environment through their mobile devices. <sup>512</sup> In 2018, a collaboration between Google and CyArk, a nonprofit in California, created online three-dimensional (3D) models of 26 heritage sites in 18 countries based on CyArk's documentation of the sites since 2003 using digital photography, drones, and 3D lidar. <sup>513</sup> In 2021, during COVID-19 restrictions, UNESCO launched its World Heritage Site Virtual Tours <sup>514</sup> in collaboration with Google Arts & Culture to enhance access to 12 cultural sites.

Other countries have also brought historical sites to life through AR that dynamically and interactively overlays information onto physical reality in real time, including:<sup>515</sup>

- Tower of London, UK<sup>516</sup>
- Fort Siloso, Singapore<sup>517</sup>
- Japan's many heritage sites during Expo 2020<sup>518</sup>
- Saudi Arabia's Royal Commission for AlUla

Museums have also begun integrating AR as a means of bringing objects or scenes to life, adding layers of information from detailed explanations to 3D artist information and additional narrations. <sup>519</sup> Accessible by smartphone, AR is transforming traditional displays, making them more interactive and engaging and attracting diverse global audiences. <sup>520</sup>

By 2030, the value of the metaverse could reach nearly \$5 trillion, <sup>521</sup> offering a \$20 billion opportunity for the travel industry. <sup>522</sup> Innovations in AR technology have also increased, with patent growth doubling between 2018 and 2022. <sup>523</sup> The AR market is expected to grow at a CAGR of some 24% until 2035. <sup>524</sup>

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2021

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Enabled by extended reality (XR), advanced machine intelligence, and haptic technologies – and in the opportunity's more advanced form, BCI – digital realities transform how we experience and preserve history<sup>525</sup> and culture. Mixed reality technologies enable people to visualise historical contexts alongside the physical reality, instantaneously bridging the past and the present.

Educators and researchers could leverage these technologies to make historical accounts, culture, and scientific and technological transformations more tangible and engaging for students and develop a new form of ethnographic research.

Tourists would be able to obtain a richer understanding of the evolution of communities through time, adding substantial depth and context to their travels, while residents may discover a renewed appreciation and connection to their locales. Future generations could maintain a connection to historical landmarks, fostering an understanding of shared pasts and promoting discussions about collective futures.

# **BENEFITS**

Experiencing the past in a more immersive manner enhances our understanding of the past and the present, offering essential perspectives for tackling contemporary and future challenges.

# **RISKS**

Varying interpretations of the past lead to the emergence of new divisions in society instead of laying the foundations for dialogue. Increased tourism to sites and cities that adopt digital realities for history and culture poses additional tourism-related environmental issues<sup>526</sup> and carbon emissions.<sup>527</sup>