



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, AI & 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.⁵¹¹ 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.⁵¹² In 2018, a collaboration between Google and CyArk, a non-profit 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.⁵¹³ In 2021, during COVID-19 restrictions, UNESCO launched its World Heritage Site Virtual Tours⁵¹⁴ 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:⁵¹⁵

- Tower of London, UK⁵¹⁶
- Fort Siloso, Singapore⁵¹⁷
- Japan's many heritage sites during Expo 2020⁵¹⁸
- 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.⁵¹⁹ Accessible by smartphone, AR is transforming traditional displays, making them more interactive and engaging and attracting diverse global audiences.⁵²⁰

By 2030, the value of the metaverse could reach nearly \$5 trillion,⁵²¹ offering a \$20 billion opportunity for the travel industry.⁵²² Innovations in AR technology have also increased, with patent growth doubling between 2018 and 2022.⁵²³ The AR market is expected to grow at a CAGR of some 24% until 2035.⁵²⁴

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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 history⁵²⁵ 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 issues⁵²⁶ and carbon emissions.⁵²⁷



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