

Shaping the Future of Preserving History Through Advanced Technology in Dubai

WHY THE PRESERVATION AND DIGITISATION OF ANCIENT MANUSCRIPTS IS A GLOBAL CHALLENGE

Preserving and interpreting ancient manuscripts is a global challenge due to the fragility of these documents and the complexities of deciphering old scripts and languages. Traditional methods of text recognition and preservation are labor-intensive, time-consuming, and prone to human error. Many manuscripts are damaged, faded, or written in obscure languages, making accurate transcription difficult and risking the loss of valuable historical knowledge. In the Arab world, this issue is particularly urgent, given the region's vast collection of Islamic and Arabic manuscripts that hold immense historical, cultural, and scientific value. Initiatives like the Khazaaen digital archive and the Bibliotheca Alexandrina's projects are working to digitise and preserve these manuscripts, but the scale of the task remains daunting in the face of these challenges¹.



KEY STATISTICS



AI text recognition tools can improve the accuracy can achieve a

62%

accuracy rate in restoring damaged texts. However, when used in conjunction with historians, the accuracy improves from 25% to 72%, demonstrating a substantial improvement when AI and human expertise are combined.²



The Leiden University Libraries hold approximately

6,500

manuscripts from the Middle East and other parts of the Islamic world. Additionally, the UCLA Library has a significant collection of Islamic manuscripts, with around

8,000

volumes primarily in Arabic, Persian, and Ottoman Turkish.^{3,4}



AI-powered Optical Character Recognition (OCR) systems have **significantly improved transcription accuracy, achieving levels as high as**

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for complex scripts like the Carolingian Minuscul.⁵

HOW DOES IT LOOK LIKE IN DUBAI?

Dubai, a city that values both its rapid progress and rich cultural heritage so the preservation and digitisation of manuscripts are being addressed through initiatives like the Dubai Digital Library (DDL) and the Mohammed Bin Rashid Library. The DDL aims to digitise over 1,600 books, including manuscripts, to preserve national heritage and facilitate cultural exchange⁶. Despite these efforts, challenges remain, such as the high costs of digitisation and the technical difficulties of accurately digitising Arabic scripts. These initiatives are crucial for preserving Dubai's rich cultural heritage and making it accessible to future generations.



HOW AI WILL SOLVE THIS CHALLENGE

AI is revolutionising the preservation of ancient manuscripts by automating the recognition and transcription of old texts. AI algorithms, trained on vast datasets of ancient scripts, can accurately identify and transcribe even the most challenging manuscripts, including those written in obscure languages or damaged over time. This technology drastically reduces the time needed for transcription, allowing for the preservation of a larger number of manuscripts. For instance, the AI tool Ithaca, developed by DeepMind, has been shown to significantly enhance the accuracy of restoring ancient Greek texts. **On its own, Ithaca can achieve a 62% accuracy rate in restoring damaged texts. However, when used in conjunction with historians, the accuracy improves from 25% to 72%, demonstrating a substantial improvement when AI and human expertise are combined**². Additionally, AI-powered Optical Character Recognition (OCR) systems have significantly improved transcription accuracy, achieving levels as high as 94.61% for complex scripts like the Carolingian Minuscule⁴. The use of AI also facilitates the creation of searchable digital archives, making these manuscripts more accessible to researchers and the public.





THE IMPACT OF AI FOR DUBAI

Dubai employs AI for managing its extensive manuscript collections, the city could see significant benefits, including enhanced digitisation efficiency by automating up to 80% of tasks, and improved transcription accuracy reaching up to 95%, particularly for complex Arabic scripts. Using AI would also reduce digitisation costs by 50%, making large-scale projects more feasible. Furthermore, AI would ensure long-term preservation and global accessibility of manuscripts, facilitating cultural exchange and scholarly research. Additionally, AI would improve data management and retrieval, allowing easier access to specific documents or information for researchers and the public in Dubai.

CITATIONS

¹ Bibliotheca Alexandrina, "DAAW Colloque," www.bibalex.org/daiaw/en/Attachments/LivretA4_ColloqueDAAW.pdf, accessed 2024.

² Nature, "Scientific Report," www.nature.com/articles/s41586-022-04448-z, accessed 2024.

³ Leiden University Libraries, "Earliest Middle Eastern Manuscript Collections in Leiden Now Available in Open Access," www.library.universiteitleiden.nl/news/2023/07/earliest-middle-eastern-manuscript-collections-in-leiden-now-available-in-open-access, accessed 2024.

⁴ UCLA Library Guides, "Middle Eastern Manuscript Collections," guides.library.ucla.edu/c.php?g=180194&p=1185888, accessed 2024.

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⁶ The National, "Dubai Digital Library," www.thenationalnews.com/arts/the-dubai-digital-library-aims-to-preserve-national-heritage-culture-and-identity-heres-how-1.176593, accessed 2024.