HERITAGE+
by ARCTUR

2023 Insights
into European Cultural Heritage Sector

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About Heritage+

Our heritage makes us who we are. Our past shapes the perception of our present and, in turn, how we build the future. But in a rapidly changing, increasingly digital world, this simple fact is all too easily forgotten. Indeed, new generations of 'digital natives' are, to a considerable extent, already living in a new mixed-reality world that currently has little space for our roots or cultural heritage. We want to change this.

Our mission at Heritage+ is to help society pass on cultural heritage in the digital, mixed-reality era. Established by Slovenian hi-tech company Arctur in 2019, **the Heritage+ initiative has been a pioneering force for the promotion of digital innovation in the European cultural heritage sector** ever since. By combining technical expertise with a creative interdisciplinary approach, Heritage+ helps museums and other heritage institutions to harness the power of digital technologies to their advantage. From extended reality to 3D modelling, holograms to interactive displays, Heritage+ has experience working with a wide range of technologies that can help **modernise the heritage sector and breathe new life into old stories.**

The advantages of embracing digitisation and digitalisation for the cultural heritage sector are manifold. Notably, digitisation – converting physical heritage assets into a digital format – can help to preserve cultural heritage for future generations, while also making the assets more accessible to online audiences.

3D Reconstruction of Mali Grad (Ravbar Tower)
at Planina by Postojna in Slovenia (courtesy of Arctur)

In this way, digitised assets and 3D scans can also be of great use to researchers and academics, as well for creative industries. Furthermore, digitalisation and the proliferation of digital interpretation technologies for cultural heritage represents an **exciting opportunity for museums to engage new and existing audiences in more immersive, interactive ways.**

For these reasons, we believe that digital innovation represents the future of the cultural heritage sector, and we want to support the heritage sector throughout its digital transformation. It is this commitment to collaboration, creativity, and excellence that defines the Heritage+ initiative.

Museum as a collection-holder and presenter		Museum as a learning hub & a community-builder	The end of museum as we know it
Analog Cultural heritage as-it-is + additional information	**Digitisation** Making cultural heritage available in digital format (e.g. photos, e-archives, 3D scans…)	**Digitalisation** Using new business processes for managing and presenting of digitised heritage in heritage institutions	**Digital Transformation** Societal effect of digitalisation (a new socio-cultural reality)

Heritage Showreel

Heritage Handbook

Introduction

The museum sector, as we know it, is experiencing a period of rapid change. The reasons for this are manifold, ranging from shifting visitor preferences to political instability and climate change, and indeed may vary between countries or even institutions - but **one common force for change is digitalisation.** The integration of digital technologies and digitised data within cultural heritage is having a transformative impact on the contemporary museum sector, including how museums communicate with their audiences. Such sweeping change can seem disorienting or even overwhelming, but **while digitalisation certainly comes with its challenges, it also brings new opportunities.**

However, for the museum sector to avail of all digitalisation can offer, it is first necessary to identify exactly which problems and challenges are most pressing. Only once these challenges have been properly identified and addressed will it be possible to develop meaningful solutions. At Heritage+, we want to help support the heritage sector in its digital transformation, and therefore, we decided to conduct this research to **learn firsthand from leading heritage professionals what the most pressing challenges facing the heritage sector really are.**

To achieve this goal, our research process involved carefully crafting a series of survey questions; generating leads and disseminating the survey; and analysing the survey results for useful insights. These results and insights are presented here in this report.

Structurally, the report is divided into three main sections, focusing on challenges and ambitions, digital technologies, and digitisation respectively, followed by a summary of preliminary conclusions. By sharing this research, **we hope to encourage further discussion about the role of digitalisation within cultural heritage and its great potential.**

Finally, the Heritage+ team would like to thank all the survey respondents who took the time to contribute to this study, and generously shared their knowledge and experience.
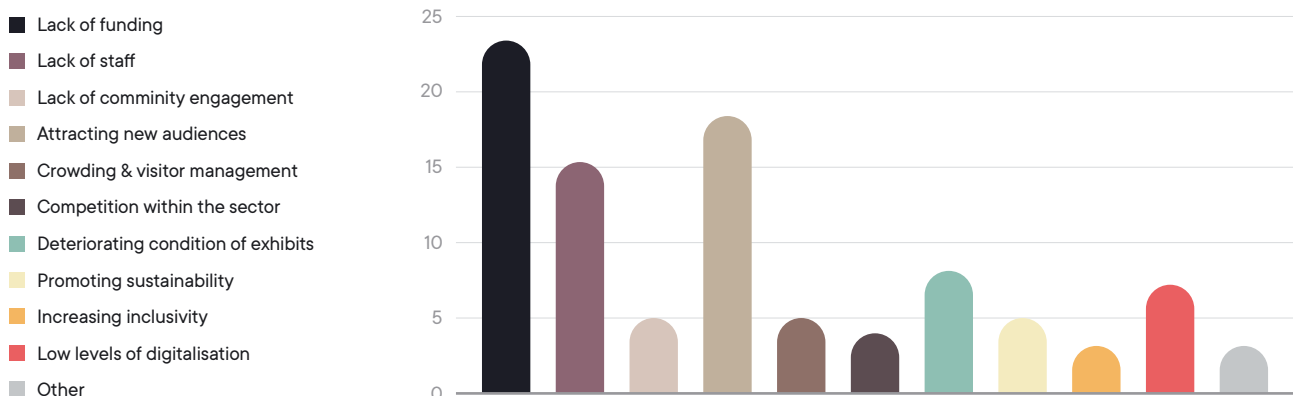
Origin of respondents to the survey

42 respondents from 42 national or regional museums and heritage institutions have participated in the survey between September and October of 2023.
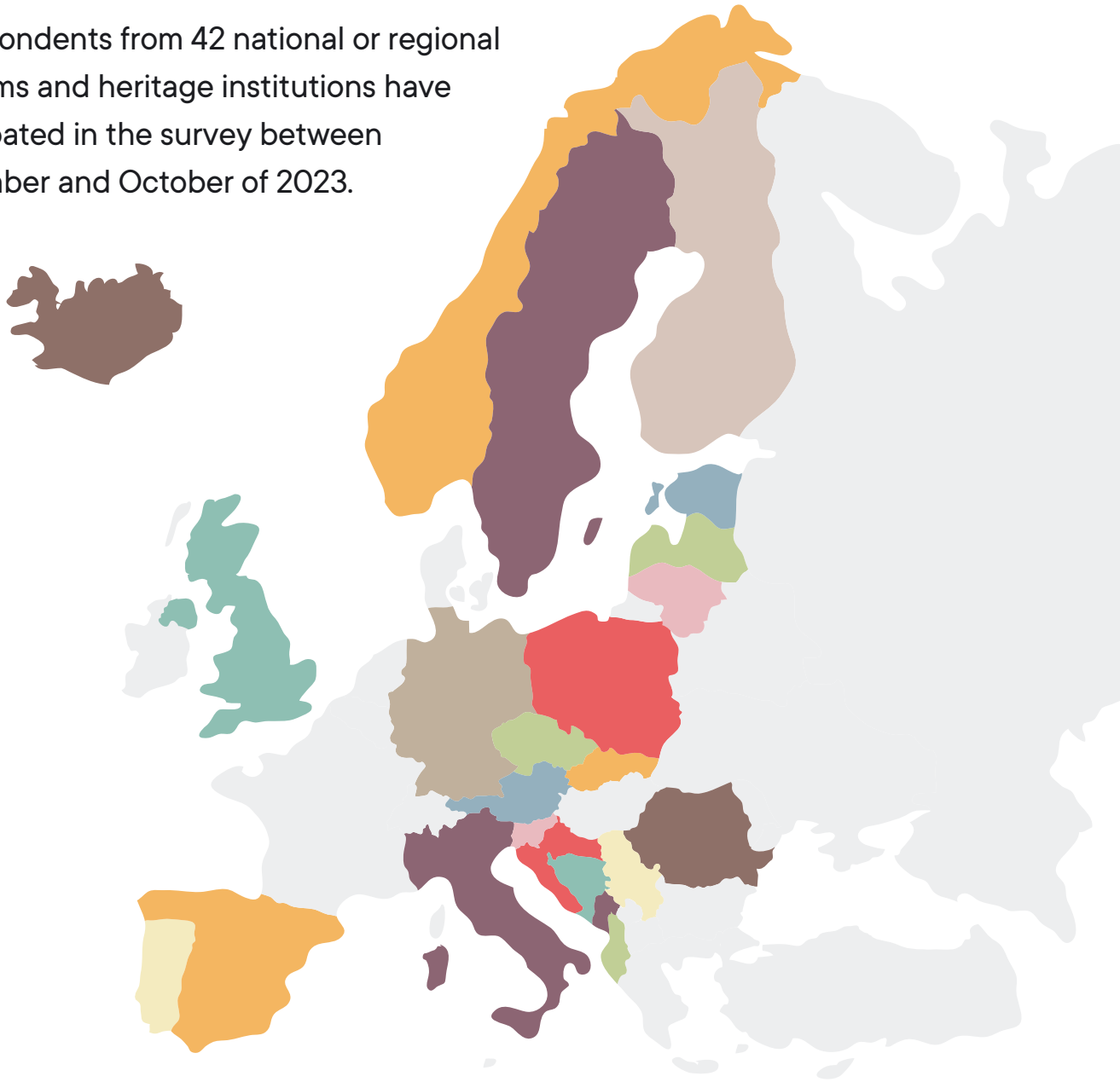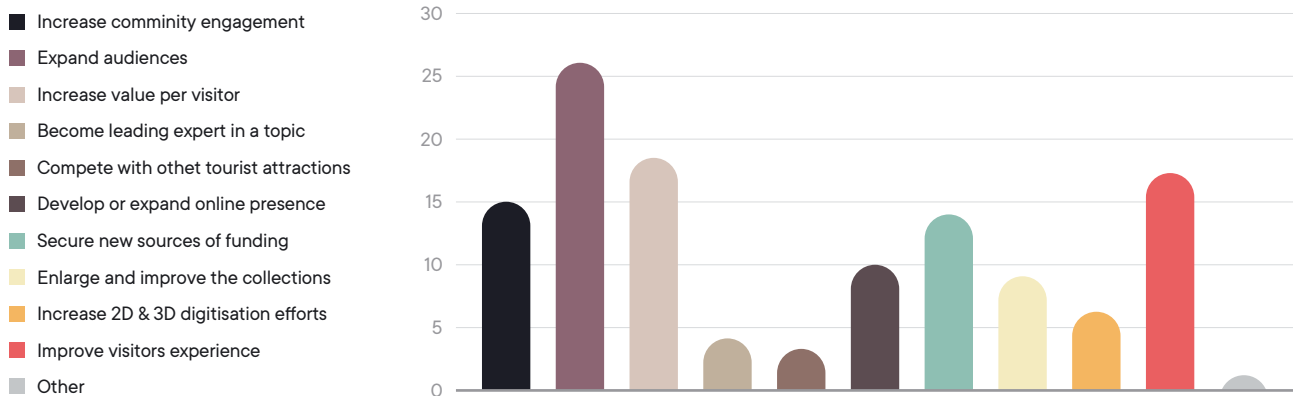
Challenges and Ambitions

It is widely acknowledged that the museum sector faces many challenges, but aphorisms like this are unfortunately too vague to be actionable. Instead, it is important to specifically identify what the main challenges are and which of these is the most pressing; likewise, which challenges are peculiar to a particular country or institution, and which issues speak to a larger sector-wide problems? Additionally, the differences between museums in terms of their ambitions is also worth considering. Effective, creative solutions most properly address these wants and needs. Key findings suggest that **inadequate funding and staffing problems represent two of the most common problems** for European museums, while expanding the museum's audience is the most common ambition.

Challenge areas of most concern

Legend:
- Lack of funding
- Lack of staff
- Lack of comminity engagement
- Attracting new audiences
- Crowding & visitor management
- Competition within the sector
- Deteriorating condition of exhibits
- Promoting sustainability
- Increasing inclusivity
- Low levels of digitalisation
- Other

Ambitions for the next five years

Legend:
- ■ Increase comminity engagement
- ■ Expand audiences
- ■ Increase value per visitor
- ■ Become leading expert in a topic
- ■ Compete with othet tourist attractions
- ■ Develop or expand online presence
- ■ Secure new sources of funding
- ■ Enlarge and improve the collections
- ■ Increase 2D & 3D digitisation efforts
- ■ Improve visitors experience
- ■ Other

Digital technologies

For museums wishing to digitalise, there is a wide range of available technologies and tools, both general and specific, for use in interpretation and internal museum management. However, implementation of these digital technologies is far from universal.
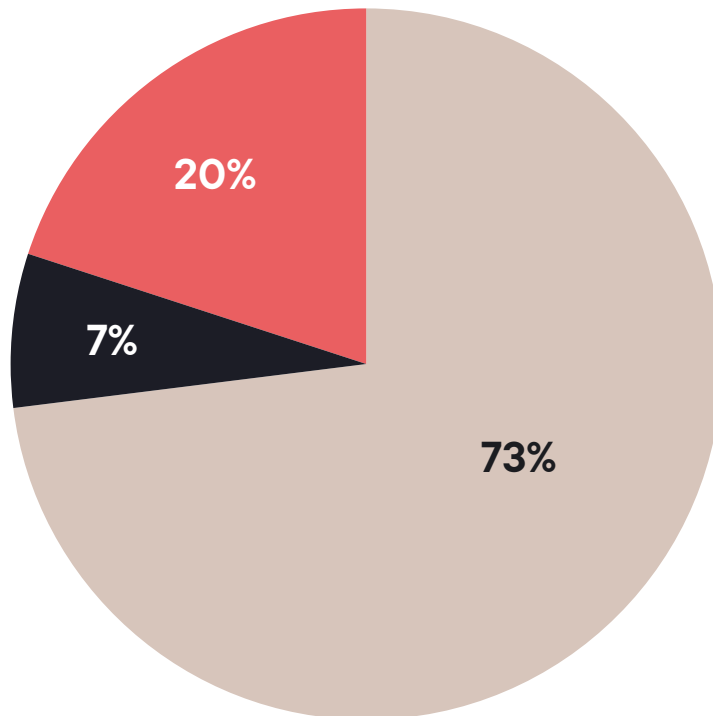
This section of the report looks at survey respondents' attitudes towards the digitalisation of cultural heritage, and seeks to identify both the most common digital technologies currently in use in cultural heritage instutions, but also those which heritage professionals are most interested in introducing in the near future. This information can offer us insight into the digitalisation journeys of several major European museums to date and their trajectory going forward.

Key findings include that the **vast majority of heritage professionals survey view the digitalisation of cultural heritage as a positive development**, and most museums have taken at least some basic steps towards digitalisation.
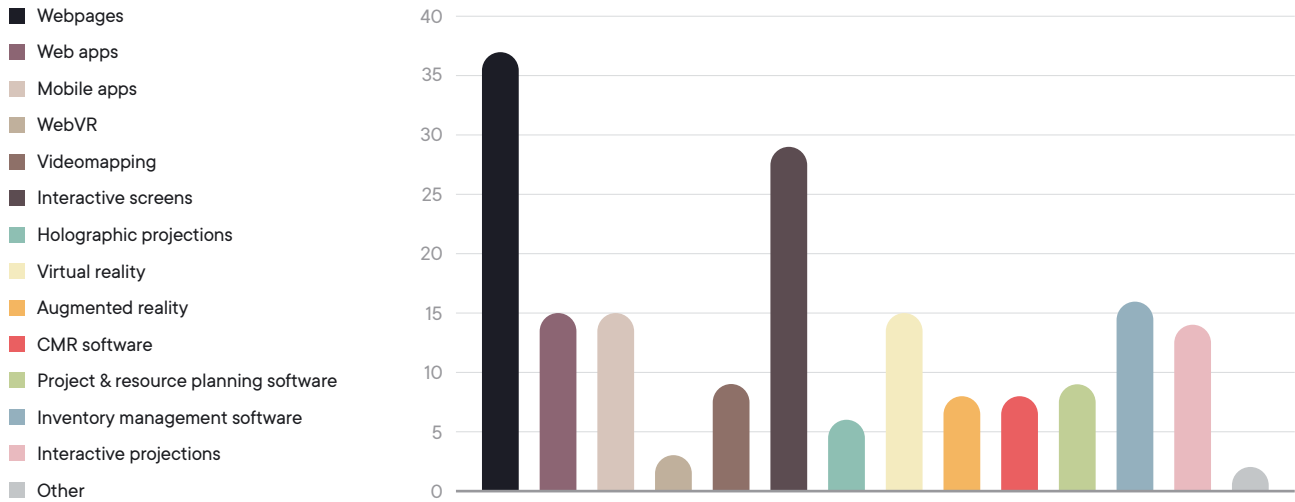
Likewise, most museums wish to further their digitalisation efforts, particularly with regards to increasing use of interactive and immersive interpretation tools. However, respondents did also identify a number of barriers to digitalisation, namely lack of funding and staffing issues, which may hinder this process.

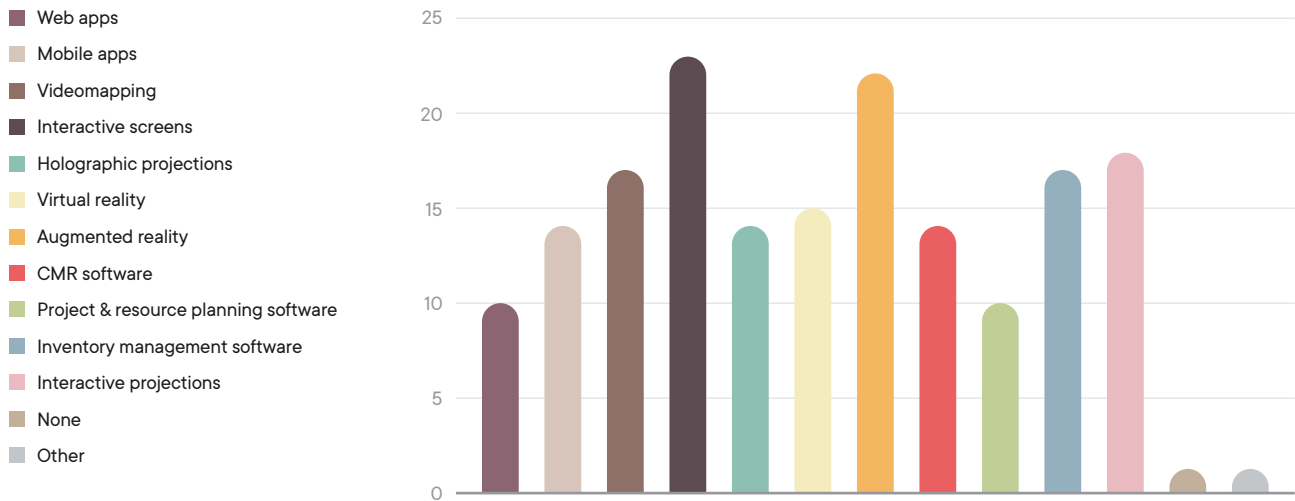## Feelings towards digitalisation of culturale heritage

- Not applicable
- Neutral
- Positive

20%

7%

73%

Current digital technologies or new media

- Webpages
- Web apps
- Mobile apps
- WebVR
- Videomapping
- Interactive screens
- Holographic projections
- Virtual reality
- Augmented reality
- CMR software
- Project & resource planning software
- Inventory management software
- Interactive projections
- Other

Digital technologies or new media plans for the future

- Web apps
- Mobile apps
- Videomapping
- Interactive screens
- Holographic projections
- Virtual reality
- Augmented reality
- CMR software
- Project & resource planning software
- Inventory management software
- Interactive projections
- None
- Other

Ambitions for the next five years

- ■ Training and knowledge resources
- ■ Ready-to-use digital tools (online)
- ■ Ready-to-use digital tools (offline)
- ■ Digitally skilled staff
- ■ Digital service providers & developers
- ■ Funding
- ■ Nothing
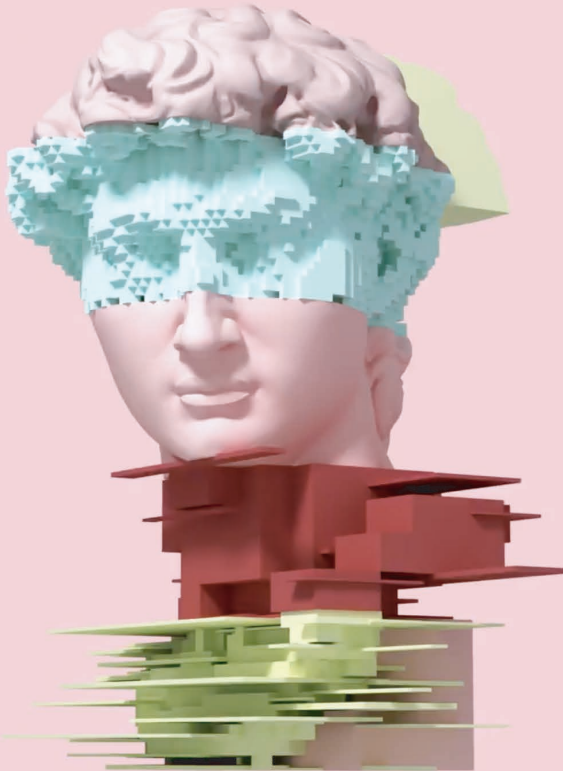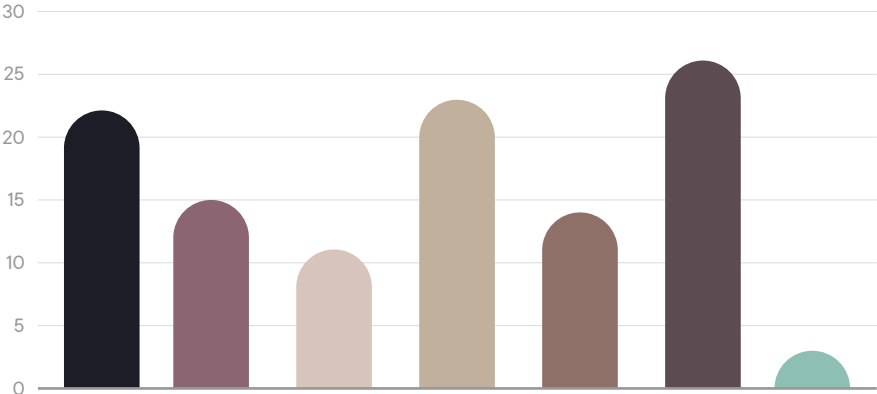
VR case study: Velenje lakes, Slovenia

Deep in the lakes of Šaleška dolina are hidden, almost forgotten, villages. But with the help of the Heritage+ team and virtual reality (VR) technology, the story of the submerged villages of Velenje lake has resurfaced. As part of a day-long experience involving a visit to the Velenje mine, visitors take a boat trip to the middle of the Velenje lake, where they don VR glasses and **virtually descend to the bottom of the lake to explore a hyper-realistic 3D digital reconstruction of the village of Škale.**

Hybrid tourist experience at Velenje Lake in Slovenia (courtesy of Arctur)

3D reconstruction of submerged Škale Village
by Velenje in Slovenia (courtesy of Arctur)

Digitisation

Museums across Europe and beyond have in recent years started to embrace digitisation as part of their collective duty to preserve cultural heritage for future generations. In particular, 3D digitisation has become an area of growing interest for many heritage institutions. Much like the role of photography in the 20th century, today 3D models are revolutionising the documentation, research and interpretation of heritage, not least because 3D models are the starting point for creating any digital heritage story: from virtual museums, virtual tours, and AR/VR/xR apps, to 3D printed replicas and souvenirs, or even in advanced research activities.
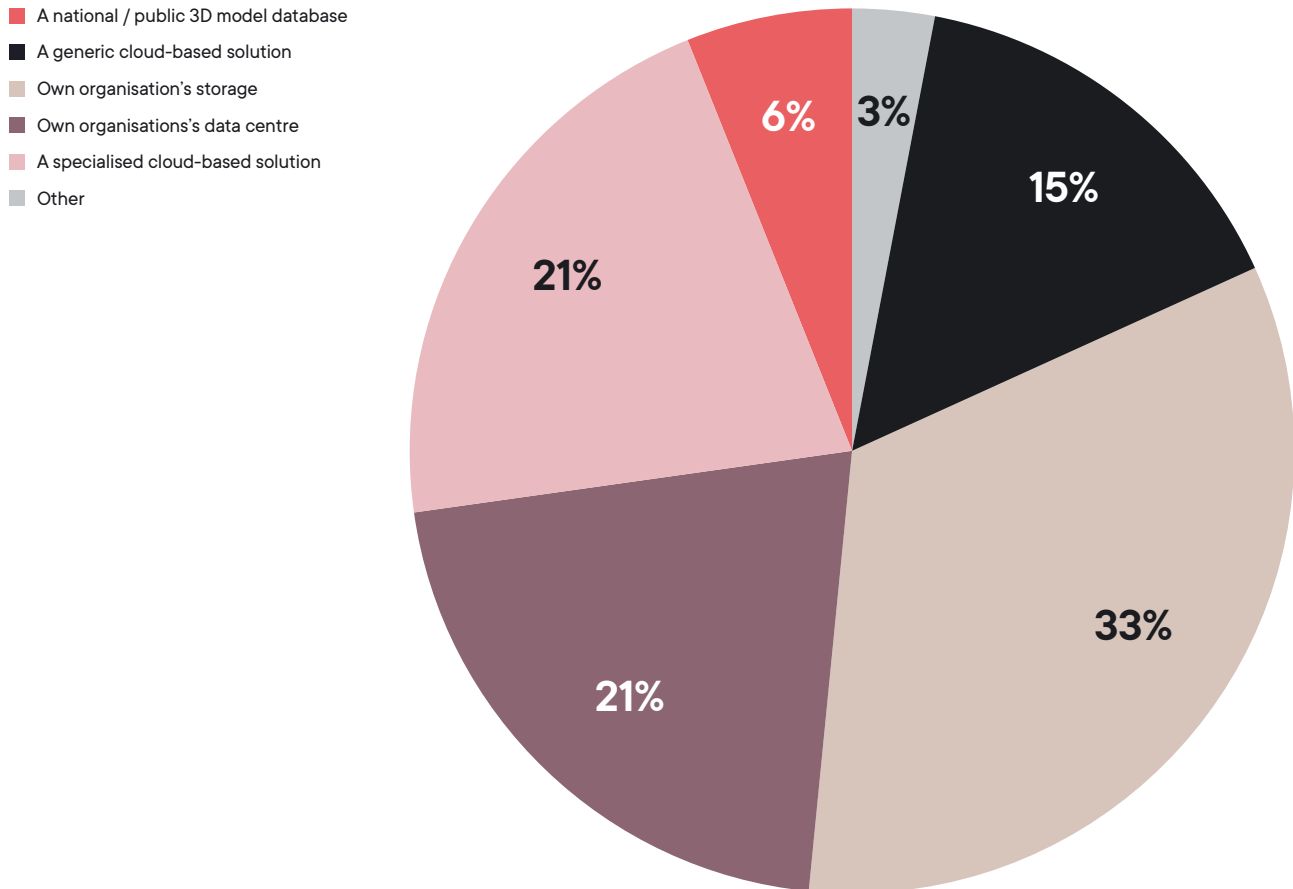
Furthermore, in 2021, the European Commission published an official recommendation encouraging Member States to accelerate their 3D digitisation efforts with the goal of digitising all monuments and sites deemed at risk and 50% of the most physically visited cultural and heritage monuments by 2030. However, the impact of such recommendations can be difficult to measure, and so one of the key goals of this research was to determine how far along most Europeans museums are in their 3D digitisation journey.

Key findings suggest that overall, **most European museums are so far only in the early stages of the 3D digitisation process,** and notably, there is very little consensus about **how best to store digitised assets once created.**

Organisation has an allocated budget for digitalisation

I don't know
No
Yes

| 7% | 37% | 56% |

Storage of 3D digitised assets

- A national / public 3D model database
- A generic cloud-based solution
- Own organisation's storage
- Own organisations's data centre
- A specialised cloud-based solution
- Other

6% 3% 15% 33% 21% 21%

3D digitisation case study: 3D Heritage

For heritage institutions with plans for 3D digitisation, one of the most important questions to consider is how and where the final 3D models will be viewed and stored. The size and complexity of such files makes in-house storage difficult and inadvisable from a security perspective, whereas using a generalised commercial cloud-based solution can lead to issues regarding the longevity of the service or the intellectual property rights of 3D content shared on such platforms. Therefore, Arctur has created a heritage-specific 3D viewer, 3D Heritage, which will collect, present, share and interpret cultural heritage through detailed, accurate and photorealistic 3D models, 360-degree photos and other audio-visual media.

3D Heritage

Hybrid tourist experience at Velenje Lake in Slovenia (courtesy of Arctur)
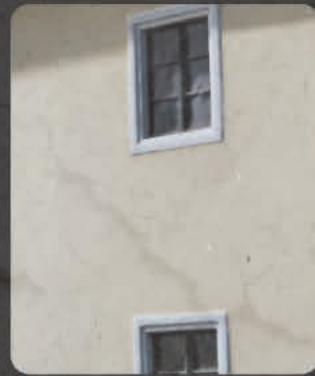
Preliminary conclusions

This research, conducting by the Heritage+ initiative with contributions from heritage professionals across Europe, has gathered valuable data about the contemporary museum sector from which we can draw certain tentative preliminary conclusions and useful insights.

While the levels of digitalisation achieved at each institution naturally vary, the results of this study create a strong impression that most museums in Europe are in the early stages of the digitalisation process. This appears to be true of both large-scale national museums and smaller 'flagship' institutions.

However, despite the slow progress to date, there is a widely-shared and marked interest in introducing digital technologies among museum professionals. In particular, many heritage experts see an important role for technology in heritage interpretation, for example by incorporating novel technologies, such as touchscreen displays, augmented reality (AR), and interactive projections into museum exhibits. According to survey respondents, **over half the institutions in this study have plans for specific digitalisation projects in the near future**, further demonstrating the interest digitalisation has attracted within the sector. It remains to be seen whether this growing interest in digital advancement can overcome the persistent funding and staffing issues which have delayed digitalisation efforts in the past. Evidently, **there is interest in digitalisation within the museum sector; now is the time for action.**

Going forward, it is vital that the digitalisation efforts of cultural heritage institutions follow a more long term vision. At present, 3D digitisation and the storage of digitised assets do not appear to be major priorities for most European heritage institutions, even among those that are keen to digitalise, but this is rather shortsighted. After all, 3D models are the starting point for creating any digital heritage story. **The digital age is here to stay, but technology is constantly adapting, meaning it is important to consider the sustainability and longevity of digital heritage preservation.** There likewise seems to be a lack of technical expertise among heritage professionals which is likely to remain a persistent problem unless museums and other heritage institutions are willing to invest in upskilling and training for their staff. Thus, the findings of this survey suggest that while the role of technology in cultural heritage has gained widespread acceptance as a value-add, the next step lies in recognising digitalisation as an essential component of future heritage planning.

Stylised 3D model of Kostanjevica na Krki Monastery in Slovenia (courtesy of Arctur)

Get in touch

Need a **strategic partner in your 3D digitisation and digital interpretation journey?** Or just need someone that implements state-of-the-art and user-friendly solution? Get in touch and let's discuss how our experience can help you achieve your goals.

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About Matevž

Matevž is curious and creative, but analytical.
He is a leader, self-starter and initiator, keen on new disruptive ideas, visionary and future-oriented.
Matevž holds a M.Sc in Urban Studies and a M.A. in Market Communication from universities in Brussels, Vienna, Copenhagen, Madrid and Ljubljana.
At Arctur, Matevž is a Lead of Heritage+ programme and has co-developed and led 20+ digitisation and digital intepretation projects, of which many have been internationally awarded and become part of the selected representative "Slovenia Unique Experiences".

About Arctur

Arctur is a Hi-Tech SME and the main private-owned supplier of HPC (High Performance Computing) services and solutions in CEE. Arctur has its own HPC and Cloud Computing infrastructure in a distributed, high-redundancy environment. The company has extensive experience in development and deployment of complex IT solutions (e.g. AI, Blockchain, HPC...) especially for Small and Medium-sized Enterprises (SME) in various sectors: from manufacturing to tourism, cultural heritage, and recently, health and medicine.