A-MAZE Artists Update 2023: Boundless – Worlds in Flux: Overcoming boundaries to virtual world integration in traditional heritage settings

The A-Maze artists Collective has been developing a Virtual World Hub for artists and their audience-participants, reaching out to new audiences and to enable deep engagement. Artworks are created as experiences using innovative technology offering immersive and deep engagement. This paper describes how, building on previous development, A-Maze Artists Collective continue to develop ‘Boundless – Worlds in Flux’ a Virtual Reality platform with a hub leading to different Artists’ spaces. During 2022, A-Maze has reached out to new audiences and deepened engagement through collaboration with museums and new user groups. There has been churn in the team and this year welcomes new artists, developers, art professionals and partnerships. This paper indicates recent challenges, methods, partners and insights on this development. The project has entered into a deeper level around overcoming boundaries including virtual world integration and implementation of the virtual world within traditional heritage settings. A schematic is indicated which feeds into development design and technical choices. Future development includes an analysis of web-hosted versus device-hosted downloadable applications offering digital interactivity and immersive experience to its users.

1. INTRODUCTION

Integration of digital technologies with traditional environments and systems presents a complex set of challenges for users, developers, and industry leadership (Håkansson & Pettersson 2019; Olofsson et al. 2015; Wilks et al. 2012). Previous work and literature is primarily focused on uptake specifically in the educational and classroom setting (ibid.), but frameworks for uptake beyond those settings remain under-explored. The A-Maze collective project has entered into a new stage exploring these challenges for artists in the context of art creation, collaboration and audience engagement, including:

(i) Virtual world integration and implementation within traditional heritage settings, which requires different approaches to digital interactivity and the technical development stage.
(ii) Curation of the Blended Experience through collaboration with museum teams to advance user interactivity and flow thereby.
promoting and deepening community conversations (e.g. with schools, youth groups, continued education and cultural groups).

(iii) Developing and deepening 3D skills and 3D content through knowledge exchange, up-skilling of collaborators and resource sharing using a Framework for Digital Foundations.


Overcoming these challenges is vitally important as digital interaction holds great potential within the cultural heritage and arts sector for both audience engagement and artist creativity. Surmounting them requires extensive commitment of resources and planning, as demonstrated in the educational sector (From & Pettersson 2022). These resources include the development of: digital assets (text, sounds, digital 2D and 3D content); digital delivery mechanisms and strategies (web-hosted versus device-hosted); curation approaches (archiving and updating); digital collaboration frameworks. Here we outline some of the approaches and considerations made by the A-Maze Artists collective in 2021–2023.

A-Maze artists collective are currently working with the Virtual Engineering Centre, University of Liverpool, preparing work for exhibition at the APT Maze Gallery in Deptford, London, during October 2023. New A-Maze artists include Ardern Hulme-Beaman and Shoran Jiang.

2. VIRTUAL WORLD INTEGRATION AND IMPLEMENTATION

2.1 Different approaches to digital interactivity

Effective implementation of digital augmentation presents a number of challenges including accessibility to materials, hardware and the additional complex planning and resource commitment required for most effective digital augmentation delivery (e.g. is the digital augmentation for audience attraction or for audience interaction). Two strategies can be used to deliver personal device digital experiences. Exhibition held approaches range from installed hardware interactives, blended digital experiences, and exhibition provided devices. Strategies using audiences’ personal devices are more interactive than museum/gallery hosted alternatives (e.g. permanent fixed touch screens) as they allow artists and museums to engage with audiences in a more personal setting, with the familiarity of their own devices.

In 2021-2022 the A-Maze Artists Collective has engaged with both exhibition held and audience personal device viewing approaches. Below we outline the use of exhibition-held digitally blended experiences and personal device delivered augmented reality. Within each there are further avenues of exploration, which we are examining for future digital content delivery and interactivity in the cultural heritage and arts context.

2.2 Technical development design decisions

Main challenges for the A-Maze artists and designer-developers, working with Unity as a gaming platform to create a VR world experience by artists for user-participants are identified:

(i) Decision to provide either web-hosted or downloadable device-hosted material, as discussed above.

(ii) Appropriate technical specifications around unity configuration and integration. In conjunction with the VEC – Virtual Engineering Centre in University of Liverpool, A-Maze artists have planned work to run in parallel with the VEC development team, through a stage by stage setup, configure and troubleshoot, in order to arrive at a clear specification of a configuration method of the system to enable integrated working across a team of geographically dispersed artist-developers.

(iii) Requirements that are identified:

(a) A proof-of-concept Unity example with multi-user functionality

(b) Development techniques, approaches or tools to support expansion of new development standards for new creator worlds which are compatible with other worlds,

(c) To include navigation systems, speed of movement, and user interface.

(d) The use and feasibility of ‘metaverse’ related techniques for running the application on common IT equipment.

The A-Maze team and the VEC team will work separately but in parallel, so that the separate intellectual property of the design, development and code is retained by both parties for future exploitation. These ten days work package is scheduled to happen between February and May. The start of the schedule will be reviewed in scoping meetings with the Liverpool Museums Team.

There is a challenge to bring together the different teams within the traditional museums to direct the type of virtual digital interactives: e.g. specification
of the target audiences, the creation and design of the storyline, content and narrative dramatic arcs, the type of user engagement be it: installation and sensory triggers, or VR headset access, or AR app on an user’s smartphone, or a mixed reality combination. These museum staff teams include: the Community Outreach; the shop/cafe and merchandise; the Curatorial Art Historians – the Collections department; IT support and IT service teams.

2.3 Outcomes

(i) Engaging the community of non-Museum users.
(ii) Generating take-aways from the exhibition, virtual and/or physical.
(iii) Enhancing the temporary and permanent collections of the Museums and Galleries with experiential cultural enrichment and user interaction.
(iv) A best practice framework that will enable a ‘low code’ approach to the wider project – that of a virtual game to engage artists, their audiences and their conversations around creative making and process.
(v) Low code approach: the notion of a ‘low code’ strategy, has been the driver for the software development industry across the last 20 years. ‘Low code’ approach is beneficial for designers rather than coders and specifically in this case – artist practitioners. A low or no code framework provides a middleware array of functional options, where a wardrobe of features can be customised using a set of adjustable attributes rather than being coded from scratch.
(vi) The future goal is to enable the online platform to include features by which new artist-developers could join the platform for future scale up, creating new spokes e.g. new spaces that are linked to a central hub.
(vii) The strategy is to design using common standards that both hold together/constrain the system to maintain functionalities – yet allow for creative flexibility and unique builds.

3. THE BLENDED EXPERIENCE

3.1 Curatorial development of user interactivity and flow

In preparation for the A-Maze exhibition at the APT gallery exhibition in Deptford, London in October 2023, A-Maze artists have been engaging with the physical experience of the APT gallery space, the local community and environmental groups gaining transferrable insights for future projects.

Gunn’s exhibition at Victoria Gallery & Museum, July – end December 2022 encompassed 2D and 3D artworks exhibited alongside an immersive installation (Figure 1). It incorporated interactivity and other sensory elements e.g. smell and touch. This exhibition delivered significant public response with over 10k visitors leaving 400+ written feedback sheets.

Figure 1: Arrivals/Departures Immersive Installation at Victoria Gallery & Museum, Liverpool.

The audience-participants offered positive and very detailed comments. These insights will guide the creation of the next dynamic, generative blended exhibition. A-Maze Artists Collective offers a curatorial approach which explores ways of introducing different perspectives and viewpoints using miniaturisation, multi-sensory and immersive artworks, alternative and inclusive ways of navigating any given space.

3.2 New relationships with the internal teams within a museum environment.

Gunn and Kendal visited Liverpool in October 2022. Gunn has an ongoing relationship with a number of Institutions in the city including Institute of Irish Studies and previously as associate/exhibitor at Tate Exchange. Conversations with invigilators and curators and observations of how audiences responded to exhibitions, pointed to the role and value of exhibition invigilators and the building of relationships of support and welcome to the community and the visiting public. Key contact included Dr Richard Benjamin, Head, International Slavery Museum (ISM), one of seven institutions under the aegis of National Museums Liverpool (NML). ISM has recruited a new curatorial team in advance of moving to a new location on the Royal Albert Dock. The pressure on NML to decolonise collections and find new ways of engaging audiences, being inclusive and accessible means that the A-Maze project has particular relevance.
The current focus is developing this collaborative opportunity with NML as a testbed for the next stage of development. The collaboration will involve several internal NML teams: IT services, Curatorial, Community Engagement & Outreach, Building Development, Merchandising and Visitor Services. Each team will have input in the development of the prototype from the outset to ensure best practice and best user experience.

3.3 Artist teams dedicated to promotion and deepening community conversations

A-Maze artists have initiated conversations with organisations and local communities e.g. schools, Deptford Green, schools from other boroughs i.e. Stoke Newington School, Higher Education Universities, Goldsmiths University, local ecology groups and cultural communities. The A-Maze artists mutually collaborate to realise their projects.

A-Maze artists’ projects in process for the APT gallery include:

Parvez – creating a co-designed, collaborative project with local diverse communities to imagine urban transformation. The interventions are ‘realistic’ and practical, or fantastical and visionary, creating an archive of images that imagine improvements and interventions. Participants will be invited to contribute images of selected sites and complete a survey about their proposed interventions. These prompts will then be used in the AI component (Midjourney and Stable AI). A series of AI-generated images will be generated (based on submission and combined with themes from each artist’s work). This process featuring our co-designers, including original imagery and text generated across different design iterations will be included in the exhibition. Outcomes include: increased awareness of the local environment, critical thinking and imaginative solutions to urban transitions, potential engagement with the local government and urban planners.

Gunn – creating a 3D fleet of imagined vessels, emerging from fibre clouds, suspended above a floor projected waterway teeming with fish and surprising elements. Working with Hudson who is designing light and movement sensors into the vessels, visitors will be able to play with the rhythms of light, change the position of vessels and smell the spices which many of them contain. In linked public workshops, participants will be encouraged to create their own vessels and add them into the exhibition if they wish, so it will be an evolving, generative experience.

Kendal – creating in collaboration with Hudson, an interactive multimedia installation for audiences to participate, displaying displaced, parallel globally dispersed worlds. A sense of ecstasies in the meeting of eyes, listening to voices, touching of the earth is ‘drawn’ from Uzbek hand-rolled desert dances in Khiva to marginalised village life on the Napa River, and then to Deptford’s gardens, walkways, markets, diverse diasporic community spaces. Working title: ‘An essay about time which pivots around the historical origins of GMT, a remnant of colonial history’.

Hudson – creating an interactive system showing the benefits and potential of tidal energy in the nearby Thames. Visitors can see how the ‘power of the moon’ can be a beneficial energy resource. They can see how the moon’s position changes the flow of water in the Thames and how this results in varying but predictable energy generation. This could be another transformation for the area following its maritime history. Hudson will also install interactive electronic devices around the gallery and inside other Artists’ works to make the whole exhibition even more interactive and engaging.

Chen – creating a series of large-format plastic sculptures resembling jellyfish suspended in the APT space. They are translucent and lightweight hanging in the dim light, sometimes they will be illuminated with ultraviolet light to reveal city maps painted on these plastic jellyfish. Combined with an interactive video projection on the movements of jellyfish, visitors can walk through the blended installation and realise that we are all connected to the sea and the marine ecosystem. Chen raises awareness of the ecological crisis and shows how we are intimately connected with our environment.

Jiang – creating a series of wall mounted prints, drawings and projections, where visitors can use their phones to scan the pictures and access other info related to the local area as pop-ups. She will create a mixed media collage on the gallery walls, referencing local graffiti as well as local shops selling diverse foods. The pictures on the wall will show local life, its built environment, commerce, culture and community spaces.

Hulme-Beaman – creating digital pieces that explore the interaction between ecology and anthropogenic change in coastal environments. In 2023, he explores building virtual environments based on historic maps of coastal towns, cities and their surrounding environs. These digital pieces explore the interaction between ecology and anthropogenic change in coastal environments, particularly growth of urban environments, adaptation of local fauna and introduction of new species through human activities (e.g. the arrival of rodent species to the UK through human activity, both intentional and unintentional). Hulme-Beaman uses photogrammetry and development of digital
environments using Blender. Outcomes include digital literacy, public contribution and creativity.

4. DEVELOPING AND DEEPENING 3D SKILLS AND 3D CONTENT

4.1 Digital Foundations

Digital foundations, archiving, collaborations, innovation are essential and need to be brought together for digital 3D to be successful and fit in traditional settings e.g. museums and galleries (Figure 2). In 2022, Ardern Hulme-Beaman joined the A-Maze Artists Collective, following a QR code project developed by Gunn and Hulme-Beaman for Gunn’s solo exhibition: ‘Arrivals/Departures’, which was built in collaboration with the University of Liverpool for the Victoria Museum and Gallery in Liverpool. July to December 2022.

4.2 Different approaches to user engagement

The A-Maze Artists Collective considers different approaches to digital interactives for audience engagement using personal devices. Design choices indicate two options: 1. Web-hosted experiences with interactivity provide efficient and effective delivery systems, but limited complexity. Here long-term interaction e.g. tracking and saving of story progression is more challenging. 2. Device-hosted digital experiences are more laborious for audiences to initiate due to commitments associated with downloads (device storage and content size). These appear to have greater commitments (downloads); however they allow greater use of complex interactive softwares that deliver a wider range of story-telling capabilities. Web-hosted interactives can present easy setup options through the use of QR code to deliver single use/single interaction content, e.g. augmented reality exhibition pieces, images or text. However, user tracking is more limited for web-based options compared with downloadable device hosted systems (e.g. tracking whether all exhibits have been interacted with by that user and releasing new ones). Both require different curatorial input, a downloadable device hosted system requires a pushed update and relies on users to accept such updates and further engage with the app, whereas a web-hosted system requires reassignment (or replacement) of QR codes with new interactives. Assessment of both available resources and desired levels of audience interaction determines which approach to pursue.

The device-hosted downloadable app approach was piloted during the Gunn’s ‘Arrivals/Departures’ exhibition (Figure 3). It primarily used QR codes located at different venues around Liverpool to prompt display of digitised artworks and thereby encourage visitors to the physical exhibition. In this first iteration of the app the digital 3D models are simply displayed and information about the exhibition is provided; future iterations could interact or develop on the physically displayed sculptures and track a user’s progression through the Arrivals/Departures exhibit. Such extensive integration posed significant challenges within the timeline of the Arrivals/Departures exhibit. However, this has provided insights into what is needed for the next iteration, including 3D model/digital asset optimisation. There is a clear demand for expansion in this area for augmented storytelling through the combination of physical exhibition and downloadable device-hosted digital content.

Moving forward, the A-Maze group explores combined approaches, using web-hosted where appropriate and device-hosted downloadable content where feasible. The functionality of the Arrivals/Departures app can be achieved using a simpler web-hosted approach, which will engage audiences that would not commit to downloading device-hosted content; this is being developed for future iterations. In tandem A-Maze is exploring device-hosted approach options to be permanently
hosted by partner museums and institutions in North-West England. These allow inhouse virtual exhibitions that artists can contribute to as visiting virtual artists. Collaboration with permanent institutions towards building device-hosted content mean app ownership can lie with the host institution allowing easier integration with its infrastructure; this includes making use of the institutions educational and extended learning equipment such as in-house tablets and devices. This overcomes the significant challenge of audience accessibility because the institution can provide AR ready devices. Further, it allows for more direct delivery of digital cultural content to specific audiences already engaged by the institution. Establishing the feasibility and effectiveness of institute hosted apps forms part of the A-Maze team’s strategies with Hulme-Beaman.

4.3 Digital 3D skills and developing 3D assets for exhibitions

Robust development of 3D skills presents a stumbling block for the uptake of digital 3D technologies in museums, which leading to sporadic integration of digital experiences in exhibitions. 3D technologies are increasingly appearing in temporary exhibitions (e.g. Arrivals/Departures, Figure 3). However, as these art pieces and augmentations are usually external commissions, their full integration and potential to engage audiences is missed. Digital 3D offers what appears to be the possibility to efficiently update/refresh or complete change exhibition content (as is seen in the continuous and rapid delivery of new content by social media users), but this aspect of digital exhibitions in heritage institutions lags behind due to the resource requirement of creating digital 3D assets (time, infrastructure, and expertise). As a result, this leads to digital displays feeling like curiosities or transient experiences, which quickly stagnate. Hulme-Beaman has embarked on training and upskilling museum professionals and volunteers in digital 3D technologies (Figure 2b). Stage one of this has focused on photogrammetry 3D model building and integration with heritage institution online presence through use of digital 3D in social media posts and online 3D model hosting websites (sketchfab.com). Stage two aims to train participants in a more in-depth digital 3D toolkit using animation software (Blender) and increase integration of these digital assets into exhibits.

Model publication statistics from Sketchfab.com clearly indicate that many museums are quickly developing in this area. Sketchfab’s ‘cultural heritage and history’ category tag was applied to >100,000 published digital 3D heritage models between 2012–2019 and a between 2019 and late 2021 a further >50,000 more were published (Flynn 2022). However, these statistics are based on self-assigned categorisation by the model publisher and are dominated by large museums and those attached to universities, while medium and smaller heritage institutions can fall behind. Training initiatives are needed to: 1) help build digital foundations in smaller heritage institutions and 2) transition those foundations and digital skills into meaningful collaboration. Participants of the North-West training initiative (National Museums Liverpool, National Waterways Museum, Lancaster Museums, Bolton Museum and Libraries and Rochdale Touchstones museum) are now all integrating digital 3D assets into their educational and teaching outreach programmes, which illustrates the transition from asset creation to asset deployment through mass training. This uptake presents an opportunity to gain audience feedback from this digital interactive medium, which the A-Maze group will be able to use to inform future developments.

5. DIGITAL FRAMEWORK AND A-MAZE ARTISTS COLLECTIVE

Uptake of digital skills in heritage institutions is determined by their digital foundations. These include skill sets and infrastructure supported that enable complete integration of digital technologies into both art and importantly art (i.e. Digital literacy, Digital Innovative Technologies and Digital Archiving). These sit above a wider set of community and cultural functions that if not fulfilled the future development and integration of digital innovations struggles. The cultural heritage and arts sector is on the cusp of these foundations being realised, but multiple areas struggle, particularly small and medium sized institutions, which slows digital uptake. Widening gaps and sources of this struggle stems from underfunding or poor reassignment of existing funding with limited knowledge of best digital practice in a rapidly evolving field. Social upheaval can either inhibit technological development (i.e. society can’t afford such development) or can accelerate it (e.g. Covid which has pushed us to embrace development). A-Maze is attempting to contribute to and cement these digital foundations and establish a long-lasting digital art presence in traditional cultural settings.

Within the digital collaboration sphere there are three different partner groups: Artists, Audiences and Museums/Galleries (cultural institutions). These are not mutually exclusive and might be better considered as a spectrum, but each have certain key ‘functions’ in this relationship. These ‘functions’ require investment and skill sets to build. For example, to build robust digital foundations requires that artists are at the forefront of digital technological innovations (AR/VR devices, including: graphics optimised computers, VR headsets, and digital
creative softwares and hardwares). Digital artists should be able to identify accessible ways (e.g. low or no code approaches) to attract and involve the wider public, thereby encouraging further creativity. For such wider audience creativity, there is a responsibility to build on digital literacy so all can engage. Fundamental to all of this is support from cultural institutions to archive and advance these digital innovations for current and future developments.

A-Maze is embarking on bridging the skillset and experiential gaps in the digital foundations of the art and cultural heritage community through knowledge and resource sharing. To achieve this the collective is taking a combined approach to pursuing financial and intellectual investment in digital infrastructure, interaction and engagement with multiple audiences, workshops and development of digital interactive software. These approaches will help deploy the rapidly expanding inventory of 3D assets and ensure the display of digital 3D materials is taken to a more interactive and engaging level. This approach to digital collaboration with integration and continuous feedback between artists, audiences and host institutions will ensure digital installations go beyond commissioned curiosities. Future digital features should be permanent, dynamic and evolving. Evaluation can include publication of digital assets, collaborative partnerships, distribution of display both virtually and physically.

6. REFERENCES

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