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Awe or Empathy, Fast or Slow? Articulating Impacts from Contrasting Mobile Experiences

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Abstract

Amgueddfa Cymru—National Museum Wales has piloted two very contrasting approaches to the use of mobile technology in two geographically and contextually different museums. Olion/Traces is a bilingual storytelling audio app that takes visitors on a journey around St Fagans National Museum of History, developed in partnership with Cardiff University and Yellobrick as a playful and transgressive narrative, revealing fragments of fact and fiction inspired by St Fagans. At National Museum Cardiff we are piloting a technology first for UK museums: Museum ExplorAR; an Augmented Reality, trilingual, self-led mobile experience providing visitors with a "wow-factor" means of delivering new interpretation. While these two projects are very different in their outputs, their approach draws some interesting comparisons. They were both projects that were given space and trust to allow ideas and fresh thinking to emerge—with the visitors at their core—rather than perceived Museum needs. This paper will explore how the different design approaches have led to a more experimental culture for digital experiences, setting out lessons learned that can be of use to large and small organisations alike.

Keywords: mobile, experience, audio, AR, augmented reality, storytelling

Introduction

Amgueddfa Cymru—National Museum Wales, an organisation that comprises seven national museums in Wales, has been cautious in its approach to developing mobile experiences due to budget restraints and lack of capacity. Nevertheless, in recent years it has piloted two very contrasting approaches to the use of mobile technology in two geographically and contextually different museums.

Reflecting across those projects in this paper, we explore current debates about mobile experiences: What kinds of feelings can mobile experiences illicit? How can we best ensure an audience for those experiences? How important is storytelling in mobile communications? In these reflections, we try to articulate a kind of "sweet spot" for Amgueddfa Cymru—National Museum Wales' approach to mobile experiences going forward, one that we hope others will find helpful in their own strategizing for digital.

The next two sections introduce the projects in turn, focusing on their contexts, ambitions, and impacts. First, we overview *Traces* (*Olion* in the Welsh language) an ambient and subtle storytelling experience for one or two people facilitated via a mobile application. Then we introduce *Museum ExplorAR*, a trilingual, self-led mobile experience featuring augmented reality. We then finish with some reflections on those projects and some lessons learned that may help others working on mobile experiences. Both projects were developed independently of one another, and this attempt to look across them and find touch points is itself an experiment in institutional meaning-making and strategy. One of the unforeseen and lesser-articulated impacts that we prise open in that discussion is the extent to which these projects have led to a more confident, experimental and reflexive culture for digital experiences at the museum.

Olion/Traces

Traces (*Olion* in the Welsh language) was developed as part of a research project in partnership with Cardiff University and Yellobrick (a creative marketing agency at www.yellobrick.co.uk). It is a playful and transgressive storytelling experience, revealing fragments of fact and fiction inspired by St Fagans National Museum of

History, one of the seven museums that make up Amgueddfa Cymru—National Museum Wales.

Our ambition for *Olion/Traces* was to explore how digital approaches might be utilised to create embodied experiences connecting people and place. Specifically, we wanted to design a mechanism for enhancing experience of a space without centring the technology itself. *Olion/Traces* therefore uses the technology subtly, carefully transitioning users into an immersive experience facilitated by digital, but without using the screen as the main agent. It is an intervention designed to embrace and elicit "feeling." It does not provide more information or layers of interpretation—there are many ways that is already done on site at St Fagans—but instead prompts participants to explore the site in atypical ways. The audio track encourages them to feel, to touch, and to perform their visitation at St Fagans more slowly, viscerally, and emotionally.

How does it work?

Olion/Traces is a bilingual storytelling, audio mobile application that takes visitors on a journey around the St Fagans gardens. It is perhaps best described as a cross between a storytelling experience, a meditation app, and a mobile game. It makes use of immersive audio, narrative, and sensory cues to encourage participants to engage viscerally with the built and natural environment of the site. *Olion/Traces* can be experienced either as an individual journey (via a fully physically accessible route), or a partner journey wherein users are parted and re-united in a series of playful and performative happenings.

Figure 1: In-app experience: Choosing the partner or single journey

Project delivery

In the early stages of the project, members of the research and design team spent a day on site, talking informally with members of the public and asking them to leave comments for us about the kind of digital offering they would like from St Fagans. People often told us that they had a deep affection for this site, would visit repeatedly and that they felt safe and reflective there. They talked openly and enthusiastically about the sedimented, nostalgic, and emotional attachments they had with the site, and this intrigued us. We made a very conscious and deliberate decision to start from, build on, and augment those feelings in the *Olion/Traces* project, rather than introducing new jumping-off points. We decided that we would make an attempt at "affective design," a term used in video games scholarship to refer to the construction of experiences explicitly to support "emotional and mental communication between a user and their environment." (Ng et. al., 2012).

Challenges

Alongside this end-user investigation, we held a workshop with staff at St Fagans to inform our process. At this workshop, it became clear there were very real limitations to working with mobile media at this site. Limited connectivity meant that visitors would need to access content via a self-contained experience and not one that relied on GPS or mobile signal. Hence the app. We were aware of the friction that an app itself introduces, and questions about the return on investment of heritage apps in particular, but this seemed our best option for designing the kind of experience that we had in mind. This is a decision we have not regretted, although it has presented us with some challenges. *Olion/Traces* can be downloaded via iOS and Android, and includes both individual and partner experiences in Welsh and English. As a primarily audio experience (and thus a large download) this meant a WiFi connection was preferable and that the download took some time. *Olion/Traces* was, thus, difficult for people to download on the move, a reality which added an additional layer of friction that any mobile application can do without. The app really needs to be downloaded before visitors arrive on site or in the main entrance, before they begin their journey around the site—a point in the visit where there are other competing activities and messages on offer.

Feedback and uptake

In March 2018, the project team undertook a research study to understand whether the aims and intentions of *Olion/Traces* had translated into meaningful impacts for participants. The study invited 30 participants to try the app at St Fagans and afterwards visually map their journeys as starting points for recorded discussions. This mapping activity followed the methodology used by Didem Ozkul and David Gauntlett (2014) in their own investigation into locative media and allowed participants to focus their account on what emerged as important to them, rather than being prompted by direct questioning. We spoke with 12 people who experienced the individual encounter and 18 who completed the partner journey (in nine pairs).

Figure 2: Visitors completing the Olion partner experience

The research questions guiding this project reflect the fact that *Olion/Traces* was designed to be an immersive and affective digital heritage encounter:

1. What kinds of transitions, transactions, and thresholds make processes of immersion possible?
2. How does it feel to be a participant in an immersive experience? And how can researchers fruitfully explore the affective dimensions of immersion?
3. How is narrative accessed and experienced within "immersive heritage" (Kidd, 2018)? Is narrative coherence desirable and practicable?
4. What happens when immersion "fails"?

The research demonstrates that *Olion/Traces* did facilitate different kinds of engagement with(in) St Fagans. It slows people down, connects them with the

landscape, gives them a strong sense of presence, and has an overwhelmingly positive impact on how they talk about their well-being (Huws, John and Kidd, 2018). To borrow and extend Mark J. P. Wolf's term (2012), the "narrative fabric" of St Fagans—coupled with *Olion/Traces*—translates into an emotional fabric, where any number of emotional resonances crisscross each other, and share moments in time and space. Participants reflect in incredibly rich language on how the experience has changed their patterns and practices of visitation, perhaps immutably:

If every museum had something like that, I would just be all over it. It's just so amazing. [Individual experience 6]

I think it's quite good for focusing you on giving a damn about the site . . . I think it would get you into the site a lot more, it would get you talking about the site a lot more. [Participant 4, Partner experience]

I've always enjoyed coming to St Fagans anyway, but I think next time I'll be walking round, I'll be thinking of this. [Individual experience 1]

I've been here so many times, and I don't think I've ever really taken in the beauty of the place. [Individual experience 7]

Now I am part of this place. I feel like I am more than just a visitor. It's quite powerful. [Participant 9, Partner experience]

As of 16th January 2019, there have been 1,157 downloads of *Olion*/*Traces* across Android and iOS.

Future plans

There has been much interest from within the sector in the way *Olion/Traces* works at the interstices of storytelling, technology, place, and emotions. We would like to find ways of continuing our collaboration and are applying for further research funding to make that possible. For the museum, *Olion/Traces* has been a useful case study of the creative and operational implications for developing such an experience. Whilst we shouldn't be afraid to retire apps and digital experiences, there is an ambition to build a legacy for the content developed as part of the project. Additionally, the upgraded infrastructure at St Fagans is better placed to support future plans for digital and mobile experiences.

Museum ExplorAR

The second project is very different in its scope, design, and delivery. *Museum ExplorAR* is an Augmented Reality (AR), trilingual, self-led mobile experience providing visitors with impressive animations and a "wow-factor" means of delivering new interpretation and updated contemporary story lines to some of our most popular permanent exhibitions.

National Museum Cardiff, the second most-visited of Amgueddfa Cymru— National Museum Wales' seven museums, has popular permanent exhibitions that have not been updated for many years. (Some displays are up to a quarter of a century old). The museum receives around 525,000 visits per year, 57% of which are repeat visits, so it is important to provide additional and enhanced interpretation to augment permanent displays. We wanted to explore how best to do this without the labour and cost of a major physical overhaul involving big budgets, lots of staff, contractors, and complex project management. National Museum Cardiff has recently removed a fixed suite of Apple iPads which had come to the end of their lifespan. Rather than replacing them, the museum wanted to explore more dynamic and agile ways to complement its art installations (Murphy, 2018).

*Figure 3: The Museum ExplorAR in use in the
Dinosaurs and Prehistoric Creatures experience*

During the summer of 2018, the museum began a 16-week pilot project to investigate the feasibility of employing augmented reality for enhanced interpretation. The initial objective was not to generate income but to evaluate how best to employ new and emerging technologies in our museum spaces. Augmented reality (AR) can aid and direct the visitor's attention by emphasizing and superimposing content and graphics (Ghouaiel, 2017), so the technology was an appropriate choice to meet the needs of the museum.

Using a handheld device available to hire from the shop, visitors to National Museum Cardiff can explore the following self-led experiences:

1. **Underwater life:** Witness our sea creatures including jellyfish, manta rays, and sharks come to life in the Marine Gallery, and see our humpback whale skeleton as it would have looked when alive.
2. **Monet's Water Lily Garden:** Explore the inspiration for our collection of Monet's water lily paintings. Listen to Monet introduce the Impressionist gallery and also meet the Davies sisters, who collected most of what you see in the gallery.
3. **Dinosaurs and Prehistoric Creatures:** Discover the lives of dinosaurs from 220 million years ago; see their skeletons brought to life, and swim with the prehistoric creatures that once swam in our seas.
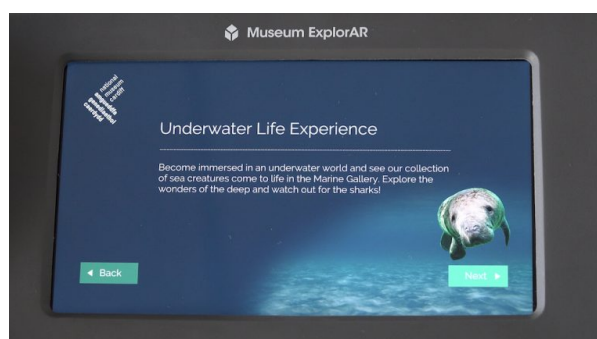
*Figure 4: Museum ExplorAR introduction screen
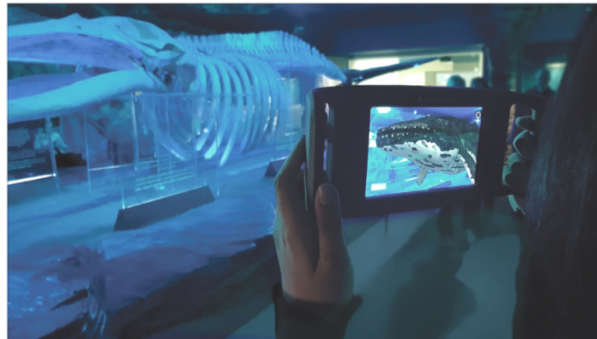to the Underwater Life experience*

*Figure 5: The Museum ExplorAR in use in the
Underwater Life experience*

How does it work?

The system uses a combination of area learning with AR. Essentially it means that, rather than having to rely on traditional AR triggering methods (such as image tracking within your camera view or markerless AR, which requires the user to place their own virtual content within a scene), the *ExplorAR* can tell exactly where the user is within the gallery and can trigger appropriate content accordingly. This makes for a much more immersive experience giving users the freedom to explore all around the virtual content with no restrictions.

A huge bonus of the system is despite the *Museum ExplorAR* offering a geographically aware tour, there is no requirement for any WiFi, GPS, or data networks, overcoming many connectivity obstacles in a complex and busy public space. All the data required is stored within the units themselves. This was a consideration due to networks being upgraded at National Museum Cardiff during the pilot phase. The only connectivity requirement is a small packet of data sent over WiFi containing the usage statistics. This data is only sent when the units are recharging and idle.

Project Delivery

The project itself was developed rapidly over a four-month period from concept to delivery.

The museum established a small effective team (three core members), with key decision makers consulted to resolve issues and progress the project quickly. A small curatorial team was consulted for core interpretive information, whilst our contractors, a local software development company (http://www.jamcreativestudios.com) worked closely with the museum to develop story lines, graphics, and technological hardware and software. A swift user testing phase followed the beta release isolating and rectifying issues quickly.

Rather than launching the pilot with a big fanfare, we wanted to gently introduce this new experience to our visitors to:

1. Test the feasibility and understand the appetite for this type of technology with our visitors
2. Allow the museum a chance to test the additional administrative tasks. The shop had to sell the units, get them to sign disclaimers, take deposits, keep an eye on the charging sequences—all on top of their normal busy jobs. The museum assistants had to support visitors in wayfinding, deal with technical questions, and demonstrate the technology.

Challenges

Due to our active loans programme in the gallery where we were running the *Monet's Water Lily Garden* experience, the artworks don't stay in one place for very long. During planning, it was a challenge to try and mitigate against negative user experience whilst also facilitating an active loans programme. Some last-minute re-scanning of the gallery and some late night reprogramming was employed to mitigate poor performance of the *ExplorARs* as the pilot launched.

Being a fully bilingual organisation, we are used to offering everything equally in two languages (English and Welsh); however, as the museum was also running its major summer exhibition *(Kizuna Japan | Wales | Design)* we wanted to experiment with providing a Japanese version, which proved to be challenging in the development stage. Working with a non-Western character set such as Japanese

meant the text had to be translated and tested in situ. The Japanese translator had to sit with the developers to work through every single piece of text to ensure appropriate line breaks for each label.

Feedback and Uptake

During the pilot phase, we evaluated popularity, ease of use, navigation, interpretative approach, and overall enjoyment from our visitors as well as investigating the uptake of Welsh, English and Japanese languages. Over the 16-week pilot, the *ExplorARs* were rented over 270 times. The experiences have been enthusiastically received by our visitors, with 93.5% of people providing ratings of 4 to 5 stars. Over 80% thought that it offered good value for the money, and almost every single person wanted to see more experiences available in future (99.3%). Of the three experiences, *Dinosaurs and Prehistoric Creatures* was the most popular. 61% of visitors visited all three AR experiences in the loan period.

Qualitative feedback has been very positive, with younger audiences particularly engaged in the *Monet's Water Lily Garden* experience. This pilot study now features as a case study in the curriculum of the School of Museum Studies at Leicester University as an example of approaches to new digital visitor experiences in museums.

Some feedback we received from visitors and stakeholders not only highlighted engagement but also the access benefits of the experience:

This really got my kids engaged in art for the first time. (5 stars)

Star rating—5! This is one of the most creative re-imaginings of a gallery that I have seen, and it opens a new world of possibilities. (David Anderson, Director General Amgueddfa Cymru—National Museum Wales)

Although I often take my children into the art galleries, they are usually really quiet places, and I worry about disturbing the serious art

appreciators. However, having the Monet water lily scene made me feel more confident about being in there; like the museum were actively encouraging families to visit. (Cathryn Scott, influential blogger)

Mummy Mummy, come and look at the magic dinosaur!

Thank you for sharing this, my son is autistic, and I have been struggling all morning to calm him. He's been transfixed.

This is great. I have a visual impairment, and for once, I can see the labels clearly. It would be great if all your labels were available to read this way.
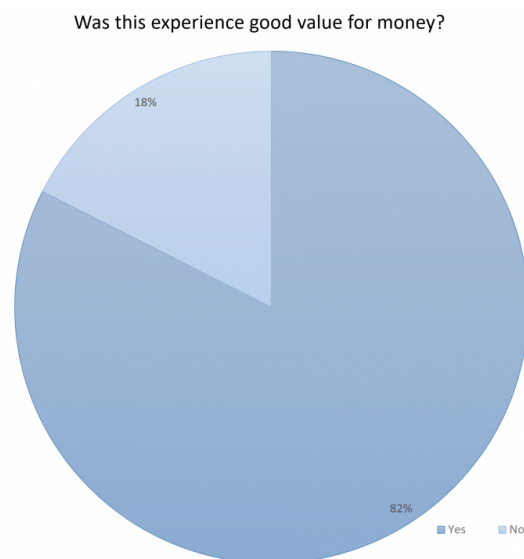

Figure 6: The 5-star rating system of the Museum ExplorARs revealed overall high satisfaction.
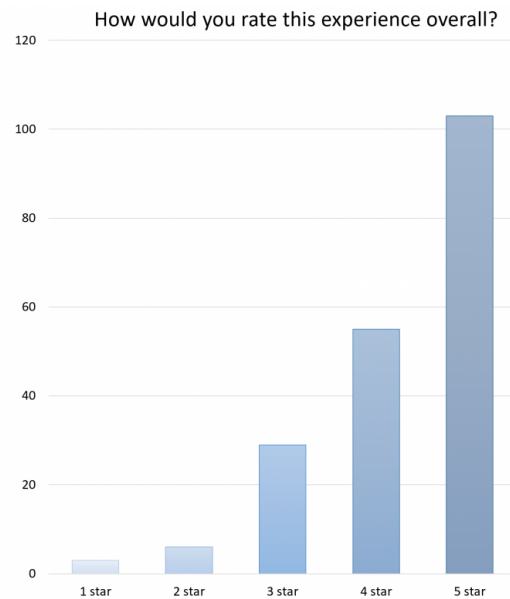
Figure 7: The 5-star rating system of the museum ExplorARs revealed overall high satisfaction.
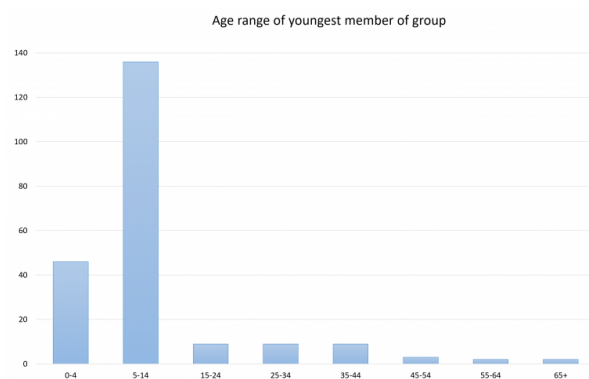

Figure 8: The majority of users of the ExplorARs were between 5-14 years old.

Future plans

Following on from the successful pilot phase, we recommend continuation of the experiences, with any updated narrative focused on an audience between 5 and 14 years old. Now, we have tested the logistics of hiring the devices, we are confident in increasing marketing and promotion. Working alongside teachers, we plan to establish an income model for hiring out the experiences to school groups. Future concept development is being considered for other spaces across our family of national museums across Wales.

Reflections and Lessons Learned

According to the media and some commentators, mobile technologies are "transforming" (Abrams, 2017; Furness, 2018) and even "revolutionizing" museum and gallery visits (Song, 2017). Yisela Alvarez Trentini, for example, states that "augmented reality is truly revolutionizing the way we interact with information, with our history and the world around us" (2017). Yet, regular attendees of museum computing conferences will know that these claims are naïve at best; to date, the impacts of mobile experiences have been far more ambiguous. Within those contexts, the realities of working with mobile communications are becoming clearer (Tallon and Walker, 2008, Green, 2016, Bennett, 2018).

In scholarly discourse over the past decade, these realities have been well documented also. Roussou and Katifori sum up that scholarship proposes a number of "considerations" for museums' work with mobile media; how those media can interact with (and distract from) the objects, interfere with navigation and orientation, restrict visitor autonomy over their experience, limit personalization, and (most importantly to Roussou and Katifori) use a primarily didactic method of interpretation (2018). Steve Poole notes that although mobile experiences *can* be ways of challenging historical knowledge and its production, more typically they are limited in their use to augmented guidebooks and information resources (2017). Galani and Kidd talk about the difficulties of producing and making sense of data related to mobile heritage experiences (2019). As a consequence of all of these concerns, mobile experiences, their promotion, and their evaluation have often erred on the side of convention. This is something we have begun to reflect on, as we demonstrate in this section.

As has been made clear above in summarising our own projects, both were led completely independently of one another and had very different technological ambitions, infrastructures, and impacts. After they had both been launched however, we began to see synergies in our reflections and our takeaways from both. Here, we elaborate on those reflections in turn: promotions and marketing, downloading, onboarding, experience and usage. What emerges from those reflections is a new way of thinking about mobile experiences for the museum.

The Importance of Promotions and Marketing

Both experiences have been under-promoted.

The *Olion/Traces* team had ambitions for a series of playful interventions and promotions—such as performances or games—for those planning to visit or those already at the museum. As an externally funded research collaboration, however, the project sometimes fell between the cracks at the museum, struggling to get traction for delivering the broader suite of marketing and promotional activities that had been conceptualised; things like signposting the start of the experience and offering free headphones, for example. In contrast with the AR experience, the timescales for delivery were much looser, meaning messaging was difficult to sustain, and budgets remained unspent due to the lack of urgency. Perhaps having *Olion/Traces* available for a limited time would have driven more footfall and defined tighter deadlines.

The *Museum ExplorAR* pilot didn't receive much promotion either, though as the museum was piloting new technologies, it was more a case of user testing as opposed to selling a product. However, we found that visitors who saw it being used were more likely to hire units themselves. One of the unexpected benefits of the *Tim Peake Spacecraft* exhibition being held in tandem with the pilot was that the museum was able to cross-promote both augmented reality and virtual reality experiences. Disappointed under 13-year-olds unable to use the *Tim Peake* VR Experience were keen to try out the AR experiences instead.

We would, thus, agree with scholars and commentators who champion the role of promotions within digital heritage work, and in the future, would hope to use more extensive and creative marketing for such projects, continuing to seek out opportunities for cross-promotion. We learned a valuable lesson here. As Martha Henson admonishes, "stop wasting money on digital projects if you aren't prepared to promote them properly." (2016)

Acknowledging (and Overcoming) Download Barriers

As noted previously, downloading apps is seen as a big barrier that museums struggle to overcome. This is perhaps, in part, related to the above discussion about promotions, a lack of large marketing budgets and a paucity of signposting

before and after visits, but it can also be due to WiFi infrastructure or other technical concerns.

Olion/Traces is a big download, which was most likely off-putting for many visitors. Due to the redevelopment of the museum at the time, we lacked the required infrastructure to allow visitors to pick up a device from the entrance or download the app at the beginning of the experience. From our more recent experience with *Museum ExplorAR* and with new facilities in place, it is now much more feasible to consider handing out devices or promote *Olion/Traces* for download or streaming at the location of the experience.

For *Museum ExplorAR,* we decided to contain the experience to hired devices with no connectivity requirements. These factors were to ensure a smooth experience in galleries with poor or intermittent WiFi or mobile signal. Having a suite of devices to loan out provides us with greater control over the software, hardware, and security etc. This approach, however, did not allow for user interaction, such as selfies, through the devices themselves, plus battery life had to be monitored, especially when units were rented out without being fully recharged.

Both projects had to work with technical limitations, arriving at different (imperfect) solutions. On reflection, it is likely that there only ever are imperfect solutions for digital heritage programmes but that every effort needs to be made in each instance to find a way of articulating and framing the experience so that the choice of technology makes sense (and appeals) to visitors.

Despite the opportunities that mobile technologies present for museums, they have struggled to make an impact and draw substantial audiences. According to research conducted by Frankly, Green and Webb (Green, 2016), the average app for a cultural organisation is downloaded fewer than 1,000 times and opened less than once. Successes are few and far between, meaning that any investment has to be considered, carefully managed, and the encounters created as a result must be well promoted.

In a recent article for *The Conversation* (2018) Matthew Robert Bennet and Marcin Budka presented an honest appraisal of the challenges they encountered with *PalaeoGo!,* an AR experience that explores how museums and parks can be enhanced by 3-D imagery. When trialling the app at the Etches Collection on

Dorset's Jurassic Coast (UK), the feedback from demonstrations with the public was very positive. However, when signposted to do so, no one downloaded the app. Bennet and Budka argue that while people are interested in the technology and 3-D models, there is still a reluctance to download mobile applications (2018). If there is not enough trust in the brand, or not enough appeal in terms of fun and enjoyment, it's a hard sell. Simply getting people to download a museum app, rather than a problem with the underlying technology, can therefore be the biggest obstacle to its success. Green (2016) consolidates this point, noting that the average app for a cultural organisation has fewer than 1,000 downloads and is opened less than once. She points out, however, that museums often under-invest in key areas such as promotion and access and need to do more to ensure return on investment for mobile in order to ensure both user and institutional onboarding, a point we come onto in the next section.

Ensuring User and Institutional Onboarding

User onboarding

We thought hard about how to frame the *Olion/Traces* experience so that it referenced its affective intentions, and so that people would feel prepared to do something with a rather different tone and voice. This seemed important given the slightly transgressive and playful character of the experience, and was a successful part of the project. More attention to its marketing would have allowed us to do this with greater consistency, however, perhaps extending that playfulness into social media channels also.

The low barrier to entry, low cost, and help from staff in the shop meant that it was easy to get people started with *Museum ExplorAR*. However, as the experience is scattered across the museum, it can be challenging to get to the start of each of the three themes. That said, there is a wow-factor to seeing the 3-D objects come to life in front of you, which helps to get the user engaged with the collections and objects around them. We were keen to understand the interest taken in the interpretive labels we had added to the *ExplorARs;* it transpired that 77% of users read the additional interpretation. This illustrates that we can be confident about developing additional contemporary story lines in addition to the physical narrative in any future augmented reality developments. Due to the lack of personal data capture and having to hand the *Museum ExplorAR* units back, onboarding was a

challenge for us, we did, however, witness positive word-of-mouth promotion and visitors returning with others to share the experience.

In our discussions, we have begun to reflect on the broader issue of what happens *after* onboarding; once people have tried these kinds of experiences and like them, what comes next? How do you maintain the momentum; is it important that visitors can follow up with other kinds of similar experiences? What happens to visitor expectations (if anything)?

Institutional Onboarding

Ensuring that people within the organisation are comfortable with the idea and integration of an experience has also emerged as an important point of reflection for us. Institutional onboarding with *Museum ExplorAR* was a necessity due to the ongoing operational implications for staff and the use of the collections to design the 3-D models. This was more challenging for *Olion/Traces,* however, due to the multiple organisations involved but also the length of the project. The team did conduct workshops with multiple stakeholders and staff on site to test and iterate the experience, but keeping it on people's radar over time, proved a challenge.

Embracing the Nuance of "Experience"

Whilst the visibility of technology can be a hook for one experience—a way into the interpretation—making the technology subtle or invisible might work better for another project. Our processes of reflection are helping us to begin to differentiate digital heritage approaches in nuanced and sophisticated ways. In so doing, a much broader suite of possible experiences becomes available to us than if we are led first by the technology.

The real innovation with *Olion/Traces* was in the design process. We went into this project wanting to work with emotion and empathy rather than foregrounding experimentation with the latest tech. This really worked with how visitors talk about St Fagans. Trialling the use of affective design meant we proceeded thoughtfully and with a real eye on the kind of feelings and experiences we wanted to engender. Our own research findings demonstrated that this approach helped visitors to build stronger relationships with the museum. They saw and felt aspects

of the site that they had not encountered previously. Carefully written narratives (a mix of fact and fiction) and specially commissioned music added complex layers of sound that constructed an emotive immersive experience, rather than information overload.

We have seen in recent years something of a narrative turn within mobile experiences where, despite people's seeming preoccupation with their screens, we have begun to encourage people to look beyond them. In particular, audio storytelling experiences have been on the rise (think of the attention the Alcatraz experience has received, for example). SFMOMA recently partnered with a tech start-up—Audio Storytellers—and voices from beyond the museum world to upend tried-and-true conventions of museum audio (Pau, 2017). The Museum of London partnered with Circumstance on *A Hollow Body* (2014); ANAGRAM have worked with Historic Royal Palaces and Imperial War Museums on a number of audio-led mixed-reality experiences; Abbaye aux Dames and the Musée d'Orsay have experimented with such approaches, and our work on *Olion/Traces* is another example. There is a common understanding that more and better storytelling thoughtfully embedded in space/place *might* encourage further interaction with sites and their (mobile) stories (Roussou and Katifori, 2018). Through dynamic storytelling mechanisms, the hope is that mobile technologies can be used in less didactic ways, championing more subtle, thoughtful and polysemic meaning making in visitors and amongst groups of visitors.

Our approach with *Museum ExplorAR* was rather different, but no less thoughtful. Despite the quick turnaround on the project, a lot of thought and time went into developing the content. The focus was on piloting the technology, but we still wanted the user to enjoy a different perspective on our objects. Interpreting the art galleries was the most challenging due to the nature of the displays, so the contractor came up with creative solutions to animate the space that proved very popular. Our *Monet's Water Lily Garden* experience was the only one to include sound (in the form of a verbal presentation from virtual characters). This gallery is traditionally a contemplative space, but rather than providing or suggesting headphones, we were keen to investigate what the response would be to visitors hearing the sound from the devices. Despite one or two detrimental comments about noise, we discovered that once devices are in the space, other visitors are keen to see what is going on, often sparking up conversations within the gallery.

It is possible to draw parallels between the experiences, despite very different approaches. They are self-led, but both offer a fairly rigid scaffold. They encourage the visitors to be active, and find out more—which can work in a dynamic of one person or more. Also, both are seen as an opportunity to introduce new stories and content into spaces. Importantly, both projects were given space and trust to allow ideas and fresh thinking to emerge, with visitors at their core, rather than perceived museum needs.

Usage

The data for *Olion/Traces* are very different to *Museum ExplorAR's*, as both were collected for different purposes. That said, it is possible to draw some comparisons between the two.

Museum ExplorAR appealed more to a family or group dynamic. The "wow" factor is attractive to children and provides adults with a scaffold for a visit. Usage has been steady, boosted by school holidays and cross-selling alongside a concurrent VR experience. In the post-experience evaluation, the ratings are positive and most people seem happy with the prince-point of £10 for an hour and a half. We plan to take some more data from the handset regarding the usage, providing us with dwell-and-flow data. As we rollout further phases and invest in marketing, we hope that the usage (and, therefore, our understanding of the visitor) increases.

There's limited quantitative data available for the *Olion/Traces* app, but considerable rich qualitative and user testing analysis. The number of downloads did, at least, surpass the average app download for a cultural organisation of 1,000 (Green, 2016), but we know relatively little about who did the downloading. Outside of our user testing there were many other positive appraisals of *Olion/Traces* on social media and within local press reporting. Our research demonstrated that users felt emotionally and viscerally connected with the site through *Traces* and that the partner journey, in particular, was a striking and memorable way of experiencing the site.

Together, the usage statistics and feedback demonstrate that the museum's various publics are becoming accustomed to diverse digital heritage experiences (paid and free to access) and to articulating their responses to them. Both projects

were somewhat tentative in searching out an audience, and in future projects, we would look to be bolder in promotions as we have noted.

As we have demonstrated in this paper, we believe that it is possible to pull back from differing data sets and to work honestly across them, developing an analysis, reflections and recommendations for our institutions (and beyond). That in itself is a kind of data literacy which is no doubt becoming increasingly important in the sector.

Findings

- **Promotion and marketing needs to be ongoing**, not just a launch. Marketing needs to match the ethos of the digital product. There is no harm in being confident, ambitious, and brave. And ask for lots of money.
- **Onboard across staff and the institution.** Staff are much more keen to help with a "pilot" than they are some big fancy, digital thing that is pushed on them. This may be challenging if there are multiple organisations involved, so build a project team that represents the interests of stakeholders, and get them to work directly with those that will support the operation and promotion of the experience.
- **Build trust with users.** If it's a download, think about what will make them want to download it. How will it make them feel? What does it add to the museum experience? Is there a specific appeal, such as a game or activity? How can the answers to such questions be well communicated as an offer? Trust helps the visitor or user get across those key points of transaction, whether payment or download. It is also worth noting that visitors are happy to deal with (some) teething problems, assuming they understand they are taking part in a pilot programme.
- **Identify small and effective project teams** who can make rapid and authoritative decisions, drive ahead, and overcome issues swiftly, rather than spend time in committee-based deliberation. As long as the project can meet the objectives of the organisation's vision or strategic plan—and is realistically budgeted—then the team can build an experience that works for the business as well as the user. Piloting projects allow teams to take risks and learn from discreet failures.

Conclusions

While these two projects are very different in their processes and outputs, reflecting jointly on their approaches has allowed us to draw comparisons and to broaden our evidence base with which to strategize for digital activity in the future. The approaches, and the process of reflection we have practiced here, will be important steps in moving toward a more confident and experimental culture for digital experiences at the museum going forward, and we hope they are of use to other organisations also.

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