

DIGITAL PRODUCTION: THE PROCESS

Why digital ... and why mobile?

We live in a digital, mobile and connected world. Our visitors, staff and stakeholders are part of 'Generation C', citizens who are in *control* of their own experiences; *choose* what they will pay attention to, as well as when and how; seek *challenges*; work and learn *collaboratively*; and are widely *connected*, operating under the ethos of '*I share, therefore I am*'. The next generation has been called the 'post-Google generation' – children who will never have known a world without being connected to an electronic device and, most commonly, one that is mobile. Across all generations, participation is not only embraced, it is expected – 24/7.

As identified in the *NMC Horizon Report, Museum Edition 2011*¹:

- Increasingly, visitors and staff expect a seamless experience across devices
- Collection-related rich media are becoming increasingly valuable assets in digital interpretation
- The abundance of resources and relationships made easily accessible via the internet is increasingly challenging us to revisit our roles
- There is a growing chorus of voices advocating a more active role for visitors in shaping what museums do
- Digitisation and cataloguing projects continue to require a significant share of museum resources
- Expectations for civic and social engagement are profoundly changing museums' scope, reach and relationships

Several commentators have noted the rise of mobile technologies. In 2008 Ralph Appelbaum, stated that 'Visitors will come to the Museum with more technology in their pockets than is available in the entire museum'. Wired magazine, in 2010, predicted that websites would soon become redundant as we are living in an 'App-driven world'. In May 2012 Google stated that "Mobile devices have become indispensable to peoples' lives and are driving massive changes in consumer behaviour"². Stein (2012) cited sources that claim by 2013 "... mobile phones will surpass personal computers as the most prevalent means of accessing the internet worldwide" (p.216). He also noted that "It's no longer strange to think that a typical visitor to museums might create pictures and video about their visit, or even write about it on Facebook or their blog" (p.217).

¹ Johnson, L., Adams, S and Witchey, H. (2011). *The NMC Horizon Report: 2011 Museum Edition*. The New Media Consortium: Austin, Texas. <http://www.nmc.org/publications/horizon-report-2011-museum-edition>

² <http://googlemobileads.blogspot.com.au/2012/05/new-research-shows-6-countries-are.html>

Steps to developing a digital product

According to Stiff (2002) the first step in digital production is to understand your organisation and its' business. According to George Browne Goode, writing in the late 1800s, the museum's business is, "... to contribute to the advancement of learning through the *increase* as well as through the *diffusion* of knowledge" (1991, p.337), across three spheres of operation – physical, online and mobile (Kelly, 2011).

What are the steps in considering and then developing an ICT (i.e. digital) project? Stiff (2002, p.355-363) suggests that we:

- focus on the organisational priorities
- consider whether ICT is actually the solution
- look for opportunities – ICT to develop a product, as well as threats – ICT to solve a problem
- think about measuring success – and in doing so focus on enhancing the user/visitor experience, while considering both users and non-users
- involve and engage staff: "It is no good taking a management decision to implement new systems or practices without getting the users [staff] to support these changes" (p.356) and that "Successful projects are based on shared responsibility
- plan for the future – be flexible, adaptive and agile
- develop a shared vision
- focus the project around:
 - audience
 - purpose
 - outcome
 - what success looks like (i.e. metrics)
- look at what others are doing (e.g. via #mtogo, blogs, industry in general such as [Mashable](#) and [ReadWriteWeb](#))
- specify requirements:
 - Business requirements – the why
 - Functional brief – the what
 - "Keep your options open so that all possibilities can be considered and their relative merits properly weighed" (p.360)
 - be specific, but not too specific
 - not over-complicate
 - 'chunk' the project – "turn your big problem into lots of smaller, easier ones" (p.363)

Measuring success

Chan (2008) outlines issues around measures and metrics, highlighting the fact that the use of stats will often then govern the type of stats that are used and reported. Chan also mentioned the problem with different ways of measuring online metrics and therefore, the difficulties in making comparisons across organisations. Since that paper we have seen analytics, such as Google and Facebook, improve enormously, and more widely adopted across businesses (and the cultural sector) to enable meaningful comparisons.

When measuring success of mobile products Burnette, et al (2011) suggested a set of metrics that include number of downloads; earned revenue; user engagement and satisfaction as well as how the product “is developed as part of a [museum’s] larger ecosystem of products, platforms, and outreach initiatives”. They state that the advantage of mobile is the “unique ability to meet other needs of the museum’s mission, offering greater possibilities for extending outreach”.

Teather and Wilhelm (1999) in one of the earliest papers discussing measuring online engagement remind us that constructivism (as proposed by Hein, 1998) is a useful framework in developing and, therefore, evaluating a museums’ online presence and audience engagement (see also Kelly, 2011). They also reiterated that: “As professionals, we must remain reflective, so that our work in this area can build on a solid existing foundation toward a greater understanding of the virtual visitor’s museum experience. At the same time, our increasing understanding of the museum on the web will continue to enrich the ways in which we explore the totality of the museum experience, both virtual and real”.

CASE STUDY: Digital engagement @austmus

Defining the Australian Museum’s strategy

The overarching mission of the Museum is to *inspire the exploration of nature and cultures* across our diverse audiences in ways that they want to engage with us – whether online or offline. Within the context of that mission, our digital engagement with our audience is aimed at:

1. Making our knowledge and collections as accessible as possible to our diverse audiences.
2. Using information from and about our diverse audiences to better meet their needs and reach our goals.
3. Connecting our diverse audiences across a variety of mediums.
4. Creating a ‘thank-you economy’³

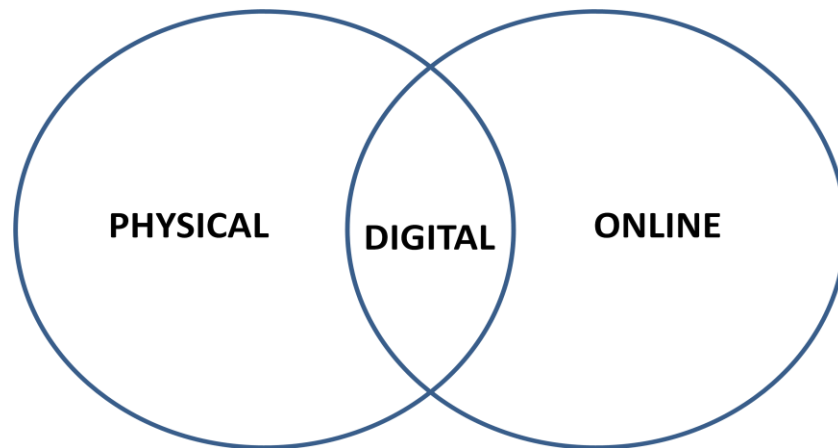
We aim to achieve these goals through:

- encouraging staff to think broadly about the best digital solution for exhibitions, visitor and education programs, research trips, collection databasing etc
- continuing to gather and analyse information about our diverse audiences (online and onsite) and integrating this data into our projects
- keeping up to date with emerging technologies and processes

³ <http://www.youtube.com/watch?v=2UkiM3OaHxw>

The Museum's Digital Engagement Strategy aims to engage visitors with digital devices wherever they are, and articulates the ways in which we bring together our digital *content* and our diverse audiences across a range of platforms, as in the following diagram.

Digital Engagement @austmus



Where is the Museum now (and in the future) in digital engagement?

The Museum currently has a 'Responsive Web Design' **website** that is effectively delivers content across a wide range of devices. However, the content coverage is patchy – strong in some areas (particularly in blogs, providing event information, animal fact sheets, exhibition content and rich media) but weak in others (particularly Indigenous Australians information, dinosaur paleontology, entomology and some Australian animals). Our **social media** engagement, starting with a loose collection of in-house blogs and expanding via Facebook, Twitter and YouTube, is well-established with input from across the Museum.

We are currently rolling out a vast digital signage and rich content project (known as **Connected Museum**) which aims to highlight our exhibitions, research and collections, visitor and education programs, Indigenous Australian's content, Member's events, Eureka Prizes, merchandise, etc in various locations around the Museum. Staff across various departments are working together to produce rich content for both the onsite Connected Museum screens as well as the website and other public programs.

Many of the Museum's **collections** are digitised. However, the infrastructures in place already (the website CMS and the EMU collections database) are not integrated. We are currently exploring ways to better access our online collections through links between these different systems.

In 2010 the Museum implemented a **mobile** strategy which aims to:

- Increase *access* to our research and collections while repurposing existing content
- Share our *content* + enable user-generated content
- Build *audiences* – *reaching* new audiences and extending experiences for existing audiences
- Raise *revenue* / generate income via direct revenue (sell apps in store) and indirect revenue: (bring new and repeat visitors to College Street site)
- Extend our *brand* as contemporary, connected, cool

We have developed two mobile apps: *DangerOz*, using Sencha Touch technology, and the *Frogs Field Guide*, using native iOS technology. We are now developing infrastructure and templates for delivering future non-native apps as well as NFC and QR readers (Tapit Contentum), and aligning these with physical College Street content, specifically a “treasure trail” application (Pack ‘n Plunder for kids in the *Alexander the Great* exhibition) and a mobile labels application (*Deep Oceans* exhibition behind-the-scenes tour; *Alexander the Great* text plus audio and INTERCOM 2012 conference app). We are also working with scientists to turn previously print-publishable material into responsive websites and/or mobile websites, as well as a potential citizen-science project.

Digital production: thinking about a roll-out strategy

As the Museum is gearing up for launch of two mobile products in conjunction with our *Alexander the Great* exhibition we’ve been thinking lots about how to promote and market these to potential users, keeping in mind our ethos of engaging our audiences before, during and after a physical visit.

Burnette, et al (2011) highlight some of the issues around devices provided by museums and those provided by visitors, citing research that found visitors say they want a product on their own device yet questioning whether they actually will download it. Another issue was access – how to provide mobile interpretation for those without a device (in my opinion this will become a non-issue in future given the rise of smart device ownership). The authors discussed the need for museums to think holistically when developing mobile content in terms of formats, audience, distribution and time within the visit when access is required. Finally, they mention that internal marketing is key – not only how to let visitors know what’s on offer, but to integrate within all marketing and signage from the beginning. Their paper contains useful examples of internal promotion that can be adapted.

Smith (2011) details useful tips and insights into rolling out mobile products within the physical space of the museum, making three key points:

1. The advances in technology frees museums up from the pressure to design one mobile product that fits all users.
2. Museums need to carefully design how to roll-out the apps as carefully as the production itself, with the aim being “not to reach more users, but rather to reach more of the right users” (p.83) and that “museums need to begin making far more deliberate choices about how their mobile experiences are rolled out to the public” (p.88).
3. The roll-out should make clear to visitors the kind of experience they can expect so they can make informed choices about the experience that is right for them.

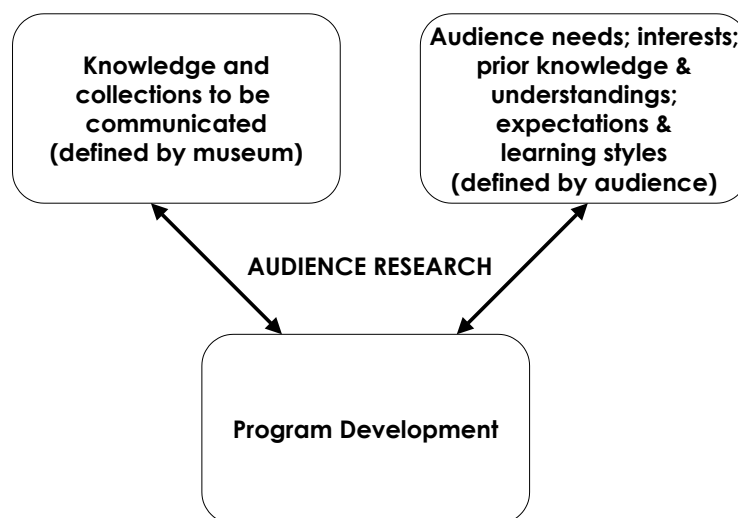
Smith detailed three mobile app scenarios and how museums could leverage each:

1. Broad appeal: reach all; not aware of mobile before their visit; must be truly usable and seamless; focus on mass marketing throughout the museum, especially at locations where they need to use the app.
2. Stealth: targeted to a niche group or small subset; will be aware and engaged before the visit with “discovery, exploration, and mystery are primary components of the application design ... the act of figuring out how the application works should be a key part of its appeal” (p.85). In this marketing is part of the app process itself and use influencers in the target audience to ‘spruik’ the app.
3. Third-party: when a museums' content is made available by an external app developer (i.e. through an API), noting that this can be difficult to schedule a roll-out and museums needing to think about brand differentiation. He suggests that museums provide incentives or ways to work with third-parties so that the products can be best marketed to encourage an uptake beneficial for all parties.

Digital production: User-testing

As identified above, the audience needs to be the prime focus when developing any museum program (not just digital). Seagram, et al (1993) described the “transaction approach” to developing programming where audience research is the intermediary between mission and market approaches to museum programming, where public programs (including exhibitions) are “... informed by the transaction between the body of knowledge to be communicated on the one hand [mission], and the public’s interests, initial biases, and understandings of the subject matter on the other [market]. The goal of such a transaction is informative, challenging, and enjoyable dialogue between the museum and its diverse audiences” (p.33). The transaction occurs through bringing together organisational goals and audience requirements by developing programs that satisfy the needs and objectives of both, illustrated in the figure below.

Transaction approach to museum program development (adapted from Seagram et al, 1993, p.33)



The transaction approach applies to the development and delivery of digital products as equally as to any other public programming and exhibitions. The key point is that the audience, or user, is at the very centre of the process, and the audience research (or user-testing) needing to be agile and iterative. Different types of testing include quantitative methods such as surveys and Google Analytics and qualitative methods such as surveys, in-depth interviews, observations and task-based testing.

User testing for online and mobile products usually follows a standard process. Tech Republic (2012) outlines ten useful tips for testing apps for the real world, as detailed below.

1: Think about how people will use the application

“Part of the application testing strategy, if you are developing for situations like this, should include the testing of the robustness of the device itself in adverse operating conditions. If you fail to include the device in your test plan, the app might be great — but it might also crash at a critical moment if the end device fails.”

2: Consider environmental conditions

Depending on where the device will be used “it is important to know the environments that users are going to use their mobile devices in — which again, makes it essential to include the device as well as the app in your test plan.”

3: Develop a comprehensive test plan with a checklist for usability as well as for app features and functions

“Eighty percent of end user acceptance of an app comes down to usability (over features and functions). Yet interestingly, an IT test plan is usually the reverse (80 percent features/functions and 20 percent usability).”

4: Actively engage users in testing

“Engaging users in testing (especially for usability and fit for environment) ensures that there are no surprises from the user side when the app goes into production. It also ensures user signoff and buy-in for the app and an ongoing collaborative relationship with the end business unit as you enhance the app over time.”

5: Engage users up front in app design

“Many IT application developers now get users involved at the very beginning of application design, especially when it comes to designing the application interface. It’s a good practice, because it provides a working blueprint of user interface requirements that your test plan can be linked into. It also puts the users (and not IT) in charge of designing the ‘look’ of the app.”

6: Prototype

“As soon as developers have a working model of an app, they should sit down with end users and demonstrate both the user interface and how data flows into and out of the interface. These demo sessions should be short and iterative (as more pieces of the app are completed), and they should occur often. Doing this will ensure that the app continues to track true to user requirements. These regular prototype reviews will significantly shorten QA and final test times.”

7: Build scalability into your app — and test for it

“Especially for Internet and mobile devices, app add-ons such as rich media should be anticipated to grow. Your design plan should anticipate this (e.g., scalability for storage, CPU, bandwidth) — and your test plan should test for it. By sizing for future expansion, you can avoid costly app redesign.”

8: Include security and lockdown

“Data encryption, conformance with security standards, and locate and lockdown ability when devices get lost are all important test points for mobile devices. IT usually gets the first two, but the locate and lockdown is often missed. It shouldn’t be. Thirty billion dollars worth of mobile devices were lost last year.”

9: Use standard APIs for app interfaces

“One of the worst nightmares for application integration (and almost all apps are integrated with various data repositories, other apps, etc.) is the development of custom interfaces that have to be changed over time — and which in turn create maintenance work on every other app they touch. You can save a lot of time in regression testing by sticking with standard APIs.”

10: Make testing everybody’s business

“We’ve already talked about getting end users engaged in final checkout and in intermediate checkouts. But it’s also good to include input (and checkout) from the help desk, which understands as well as anyone in IT what the constant user pain points are. It’s also a good idea to split your QA team into two camps: one side that tests the app for technical “goodness” and a second side that tests for usability and overall ‘fit’ for the business and the end user’s work environment.”

NOTE: This paper was developed from the lecture notes given for the university course *Museums and the Digital*, Museum Studies Unit, University of Sydney. I would like to acknowledge my Australian Museum colleagues for their input to both the Digital Engagement Strategy and for sharing links and resources.

References

- Burnette, A., Cherry, R., Proctor, N. and Samis, P. (2011). Getting On (not under) the Mobile 2.0 Bus: Emerging issues in the mobile business model. In J. Trant and D. Bearman (Eds). *Museums and the Web 2011 Proceedings*. Toronto: Archives & Museum Informatics.
http://conference.archimuse.com/mw2011/papers/getting_on_not_under_the_mobile_20_bus.
- Chan, S. (2008). Towards New Metrics Of Success For On-line Museum Projects. *Museums and the Web*: <http://www.museumsandtheweb.com/mw2008/papers/chan-metrics/chan-metrics.html>
- Hein, G. (1998). *Learning in the Museum*. London: Routledge.
- Kelly, L. (2011). *Learning in the Twenty-First Century Museum: The Museum Without Walls*. Paper given at the LEM Conference, Tampere, Finland.
<http://australianmuseum.net.au/document/Learning-in-the-21st-Century-Museum/>
- Seagram, B., Patten, L., & Lockett, C. (1993). Audience Research and Exhibit Development: A Framework. *Museum Management and Curatorship*, 12, 29-41.
- Smith, K. (2011). Mobile Experience Design: What's Your Roll-out Strategy? In N. Proctor (ed). *Mobile Apps for Museums*. American Association of Museums: Washington DC.
<http://mobileappsformuseums.wordpress.com/2011/08/05/mobile-experience-design-whats-your-roll-out-strategy/>
- Stein, R. (2008). Chiming in on Museums and Participatory Culture. *Curator*. 55(2), 215-226.
- Stiff, M. (2002). *Managing New Technology Projects in Museums and Galleries*. Cambridge: MDA, 13-25.
- Teather, L. and Wilhelm, K. (1999). "Web Musing": Evaluating Museums on the Web from Learning Theory to Methodology. *Museums and the Web*:
<http://www.museumsandtheweb.com/mw99/papers/teather/teather.html>
- Tech Republic (2012). 10 tips for testing apps for the real world:
http://www.techrepublic.com/blog/10things/10-tips-for-testing-apps-for-the-real-world/3434?tag=nl.e101&s_cid=e101

Digital @austmus Blog Posts

- Agile Development for Museums: <http://australianmuseum.net.au/BlogPost/Web-2U/Agile-development-for-museums>
- A mobile app or a mobile website: <http://australianmuseum.net.au/blogpost/Web-2U/A-mobile-app-or-a-mobile-website>
- Behind DangerOz: Developing the App: <http://australianmuseum.net.au/BlogPost/Web-2U/Behind-DangerOz-Developing-the-app>
- Behind DangerOz: What did we learn?: <http://australianmuseum.net.au/BlogPost/Web-2U/Behind-DangerOz-what-did-we-learn>
- Behind DangerOz: version 1.1: <http://australianmuseum.net.au/BlogPost/Web-2U/Behind-DangerOz-version-11>
- Behind DangerOz: working with Android: <http://australianmuseum.net.au/BlogPost/Web-2U/Behind-DangerOz-Working-with-Android>
- Frogs Field Guide: <http://australianmuseum.net.au/BlogPost/Web-2U/Introducing-our-Frogs-Field-Guide>
- Frogs Field Guide: explore frogs: <http://australianmuseum.net.au/BlogPost/Web-2U/Frogs-Field-Guide-Explore-frogs>
- Frogs Field Guide: deciding on a platform: <http://australianmuseum.net.au/BlogPost/Web-2U/Frogs-Field-Guide-deciding-on-a-platform>
- Mobile apps: to charge or not to charge: <http://australianmuseum.net.au/BlogPost/Audience-Research-Blog/Mobile-apps-to-charge-or-not-to-charge>
- QR codes: <http://australianmuseum.net.au/BlogPost/Web-2U/QR-Codes-in-2011>
- Responsive Web Design: <http://australianmuseum.net.au/BlogPost/Web-2U/Responsive-Web-Design-and-Museums>
- Rolling out mobile apps: <http://australianmuseum.net.au/blogpost/Web-2U/Rolling-out-mobile-products>
- Where the Australian Museum is at with apps: <http://australianmuseum.net.au/blogpost/Web-2U/Where-are-we-at-with-mobile>