# How to Avoid Digital White Elephants in Your Museum

by *Erika C. Shugart*

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The best way to avoid raising a digital white elephant is to make sure you have a good reason to create the component by taking into consideration audience, outcomes, and institutional values.

Done well, digital media can enhance the visitor experience and provide a deeper understanding of the subject matter. Poor execution can create a distraction or perhaps even worse a dead screen that sits in the gallery like a reproachful eye. By selecting digital media approaches wisely, iteratively developing them with visitor input, and planning for their inevitable breakage you can avoid creating digital white elephants.

**When to Use Digital Media**

There are many reasons to create a digital media piece for a gallery. Some are very valid, e.g. to illustrate a complex concept or to offer avenues for layered exploration. More questionable reasons include appeasing a donor who is gung-ho about technology or purchasing the latest technology because everyone else has it. Never underestimate the siren call of "cool" technology. The best way to avoid raising a digital white elephant is to make sure you have a good reason to create the component by taking into consideration audience, outcomes, and institutional values.

Digital media has particular strengths that can align with your goals. Currently, these are some of the typical uses of digital technology:

- Personalization—Whether it is presenting information in different languages or enabling visitors to create their own personalized tours such as in *Gallery One* at the Cleveland Art Gallery (Cleveland Museum of Art, 2013), digital media can help visitors customize their exploration. (See the critiques of *Gallery One* elsewhere in this issue.)
- Presenting layered information—The ability to present lots of information in a limited amount of space can be a mixed blessing. It enables personalization, but can be a distraction from the overall experience. If not well curated, it can feel like a visit to a website.
- Revealing the unseen—Visualizations of things too small or too large to be seen by the naked eye; the use of augmented reality to reveal information that is hidden, e.g. the ARIEL project from the Franklin Institute (Franklin Institute, 2010).
- Modeling—Complex interactions can be shown as static images, but are more effective when shown dynamically, particularly when the visitor can interact with them in a simulation (National Research Council, 2011).
- Encouraging social interactions—Museums are inherently social spaces. New approaches using tabletop or large-scale experiences can encourage visitor interaction.

Every institution has its own personality; making sure that the digital project and the institution are a good fit is essential to success. Some museums are early adopters. They are interested in exploring the use of technology on their floor as an experiment to inform their future work and the field. Others are more conservative. For institutions that fall somewhere in the middle, I recommend an Amish approach to technology. This advice may seem odd since the Amish, who don't use televisions, home phones

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and many other modern conveniences, may not appear to offer guidance on the use of digital media. However, the Amish selectively use technology. Before adopting new technology they carefully consider how it will affect their community and whether it aligns with their beliefs and values.

**Putting the Boundaries on Your Project**

At the beginning of a digital project, create a set of requirements that defines the boundaries of the project. Some items are similar to what you would gather for a non-digital exhibition project, but others are specific. In addition to information such as audience description and learning outcomes, requirements may include:

- Content background—should be provided so it is clear how much image or data processing will be required to generate the final product;
- Hardware—may include specifications on preferred input devices, computer types, output devices, ancillary hardware, and networks details;
- Software—includes preferences for the use of open-source software, programming platforms (such as Flash) or game engines (such as Unity);
- Infrastructure/context (networking, power, noise levels);
- Integration—if you are using multiple contractors, this defines who is responsible for specific items.

You may also want to include specifics such as anticipated length of the experience and style guidelines. It is important that requirements be realistic and specific while allowing for the flexibility needed to be creative.

**The Human Dimension: Outside Contractors, Team Dynamics**

Whether you are working internally or with outside contractors, teams that create digital media in museums have unique challenges that come from bridging the different worlds of IT and non-IT. Everyone starts projects with the best of intentions, but unaddressed assumptions can lead to difficult working relations and even change order creep, which can slowly balloon the costs of a project. It is important to have a conversation about assumptions with firms before the contract is finalized. Review contracts deliverable by deliverable and look at examples of interim steps that the firm has produced for other projects. When possible share interim products from past projects. This can help to set expectations of what might be produced at each stage. If you are trying to create something new and different this may not be possible, but these conversations will help uncover disconnects that can be resolved before the project is underway.

**Untrained Staff and Advisors**

Teams that create digital exhibits in museums often include staff members, advisors, or subject-matter experts who lack expertise in digital media. You don't have to turn these team members into digital natives, but you do have to provide them with enough guidance so they become "digital tourists." For example at

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the Koshland Science Museum, I needed approvals from a panel of scientific experts at three critical milestones—conceptual design, preliminary design, and final design. Getting valuable feedback during the conceptual design, phase was the most challenging, because some reviewers lacked an innate sense of what the "play" would feel like and often focused on irrelevant stand-in text and figures rather than looking at the big picture. I found coupling a visitor experience description with two or three low-resolution screen shots or conceptual drawings was a good way to get constructive feedback.

The visitor experience description is a brief document that vividly describes a visitor's interaction with the digital media. The illustrations are kept at low resolution so that the reviewers can see relevant elements, but can't zoom in on distracting details. In the subsequent phases of review, these same elements can be presented in greater and greater detail. In the final review, the reviewers should be able to playtest the media whenever possible.

It can be a struggle to help the non-technical staff communicate clearly to the technical team. One approach Darran Edmundson (2010) uses to help non-technical team members describe and prioritize their needs is user stories. Stories are written from the perspective of a stakeholder (Presenter, Teacher, Student, Team, Public Visitor), have a context that sets the scene, an explanation of how the scenario plays out, and a reason for wanting it. They are written in plain English.

### Strategies for Prototyping and Testing Digital Media

Good software development is similar in many ways to good exhibition development. They are both iterative and user-focused. Although prototyping and user testing are critical to a robust final product—time, money and organizational culture issues often get in the way. Because even quick and cheap testing is better than no testing at all it is often the cultural issues that are the biggest hurdle to testing digital media.

It is better to test early and often in order to reveal problems while there is still money and time to fix them. Approaches such as play testing with paper prototypes or in non-ideal situations, such as outside of the exhibition, can reveal helpful guidance (Schaller & Flagg, 2013). Don't let perfection become the enemy of the good. It is not uncommon to put off testing because of the desire to make the product a little more polished or add an additional function. You may want to consider using the agile method (Wikipedia, 2013), a software development approach that is centered on a frequent (often daily) development cycle that allows for rapid iteration and experimentation.

It is also important not to end testing too soon. No matter how much testing you do, most of the digital pieces that get featured in museums are custom built, therefore are likely in "Beta" when they launch. This means the media has been tested, but has not yet been used by a large number of people. Plan on spending several months after opening to observe and evaluate visitor use, track problems, and make fixes. On all but

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the simplest projects on which I worked, additional bugs and usability issues were found after launch. It is important to hold at minimum 10% of the budget and development time for use after the exhibition has opened, as you will need to change things.

### Care and Feeding of Digital Media Experiences

How many times have you walked up to a digital exhibit only to find the screen dark or the controls non-responsive? Even the most robust technology breaks down sometimes. Planning methods to keep the lights on starts long before the exhibition hits the floor. When you pull together your requirements for hardware, minimizing the different types of equipment makes it is easier to switch out components. In 2012, the Koshland Science Museum installed an entirely digital gallery with over a dozen monitors and computers. We primarily used two different monitor sizes and one type of computer. This meant that we could buy a minimum number of back-ups because they would work in multiple places. The backup computers were preloaded with all of the software so that they could be put into service quickly.

You don't want a visitor to be the first one who discovers an exhibit isn't working or to have your floor staff spend their valuable time interacting with your exhibits rather than your visitors. Having a networked system enables your technical team or an outside maintenance firm to monitor the health of the exhibits. Ideally they will be able to troubleshoot and fix problems remotely as well. This does require an upfront cost and an annual budget line item, but is well worth it when it comes to maintaining the visitor experience.

### Conclusion

Digital media is here to stay in exhibitions, and it is changing in new and exciting ways (Johnson, Adams Becker, Witchey, Estrada, Freeman, & Ludgate, 2012). No matter what the future holds careful planning, institutional alignment, productive teams, testing, and on-going maintenance will continue to be vital to the creation of successful digital projects.

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