



**Conversations with Visitors**

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Social Media in Museums

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Selected Essays

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MuseumsEtc

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## Social Media in Museums

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### Selected Essays

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Social media is changing the inner workings of our museums. Like many other organizations, our hierarchical structure has historically disseminated information from our experts to our visitors. The envisioned twenty-first century model, however, is more level.

Instead of a one-way presentation, our online visitors are often interested in having a conversation with our curators and content providers. And many of us are joining our traditional experts in representing our institutions in these conversations.

In response, we in new media have been looking for ways to engage our public by designing and using applications that encourage dialogue; however, in order to succeed all of us will need to approach our jobs and our relationships with our co-workers in different ways.

*Jeff Gates, Lead Producer, New Media Initiatives  
Smithsonian American Art Museum*

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## STRATEGY



Musée d'Orsay, Paris

# **Developing A Social Media Strategy**

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Strategies, Policies and Handbooks... Oh My! Museum marketing consultants often recommend using Twitter as one small part of a larger social media strategy, an intimidating notion for museums that are still trying to get their arms around keeping a website regularly updated. In all areas of operation, museums have a wide spectrum of formal and informal policies in place. In general, museums' involvement in web communication and social media, because the tools are so new, rests near the informal or non-existent policy end of the spectrum. This chapter will suggest some issues to keep in mind when developing a social media strategy, policy, or handbook – choose the instrument that works best for your situation – with an emphasis on Twitter. Twitter lends itself to easy experimentation, however, so no museum professional should feel reluctant to give it a try simply because your organization does not have a policy in place.

Start with the recognition that Twitter can be used in conjunction with the numerous other social media platforms. These include Facebook and Myspace (the former has somewhat superseded the latter in popularity); photo- or videosharing sites like Twitpic, Flickr or YouTube; blogs; wikis and customized social networks like ning or wiggio; and

others. In this context, a social media *strategy* would lay out institutional goals and how these tools could be employed in combination to meet those goals. A social media *policy*, on the other hand, is an internal document that governs the staff's use of these platforms in the museum's name. More common in the corporate world, a social media policy outlines the norms of acceptable internet behavior and seeks to protect the museum's brand or reputation from being tarnished. This chapter will treat both strategy and policy for museums and social media.

**Strategy: linking Twitter with other social media tools**  
There is no question that enhancing tweets with links to blogs, photos, video, or your website makes your feed more interesting to your followers. Dan Zarrella's study *The Science of Re-Tweets* (2009) uses re-tweets as a measure of popularity or interest, and he suggests that about 57% of re-tweets include a link, compared with 19% for those that are never re-posted.<sup>1</sup> When you include a link in your tweet, the text that surrounds it provokes followers' interest in whatever will follow once they click. From a purely marketing standpoint then, adding links to tweets is one way to increase traffic on your museum's website and to move your followers around the internet to

experience your museum's projects, events, and ideas in a longer form with visuals. Using Twitter with other social media compensates for the things Twitter as a technology cannot do: it is not visual, it is not comprehensive (except to the extent you can bring followers back to the same topic with multiple posts), and it is not inherently collaborative except in the back and forth of texted conversation.

Employing Twitter as part of a social media strategy acknowledges these challenges and assigns it an appropriate role in meeting the museum's wider goals, always bearing in mind the basic need to maintain and grow your group of followers through personal engagement. Will your museum employ social media to complement your museum's educational programs? To build visitor numbers in the museum? To break out of the four walls with projects? To crowdfund or crowdsource exhibits or other projects? A working knowledge of the capabilities of the various web 2.0 platforms helps build this strategy through experimentation and the observation of the initiatives of others. A constantly evolving strategy, adjusted through trial and error, is a realistic aim.<sup>2</sup>

Twitter and other social media are effective ways to reach out to younger audiences. Evidence suggests

that involvement in web 2.0 alone will probably not increase interest in your museum among teens and youth, but if that is a goal, consider as part of your strategy involving youth in developing content. The principles behind community-curated exhibits pertain here: if you want to bring any particular new constituency into the life of your museum, the best way is to ask them to contribute content that will appeal to others like them and will encourage them to involve their friends.

A few notes on the currently most popular social media platforms, and how Twitter can work in tandem with them:

*Blogging:* Most marketing experts recommend tweeting in conjunction with blogging. Tweets can become teasers for longer blog posts, by linking to the longer discussions there. In this strategy your Twitter posts bring followers to your website for more extended interaction with your museum's online presence. Blogs can be set up fairly simply now on your museum's website, depending on the communication or social media policy of your governing institution. (Government agencies have been slow to embrace blogging, so museum sites that are hosted by governments may find this tool barred to them.) Independent blog hosts – Blogspot

and Wordpress are two popular ones – also make weblogs technically simple to launch. Blogging, however, requires a commitment to long-form writing that many museums are not ready to staff. To be successful, blogs need to have the many of the same qualities as tweets: posts must be fresh and novel, they must treat topics that will interest your readers, they must include photos, graphics, and/or video, and they must be relatively frequent – at least once a week.

The fact that all this must be done in a long form necessitates a greater commitment of staff time and museum resources, although your museum can also recruit guest writers. That said, because it is long-form and can incorporate visuals, blogging can showcase museum projects in ways Twitter and other social media platforms cannot. A well-written, engaging blog has the potential to build relationships by bringing readers back to your site repeatedly, to enhance your museum's educational program, to pique interest in current and future projects, and generally to meet museums' mission to stimulate new thought.

*Facebook:* Starting a Facebook fan page for your organization offers many of the benefits of blogs and more; it works less well as a Twitter adjunct, however,

because tweeted links to your Facebook page will not work unless your followers are also Facebook members. Facebook allows you to reach people where they already gather, and current estimates indicate that 500-600 million people worldwide are Facebook users. A *page* (recommended for organizations rather than a *profile*) allows you to: make brief status updates that go directly to your fans; set up albums of photos; write notes which are not unlike blog entries; share video; conduct discussions; and notify fans of events, among other functions. Facebook also provides you with free basic statistics about your fans, their gender and age breakdown, for example. These capabilities are extremely easy to learn and use, and mistakes are easily reversible. Like Twitter, the success of Facebook as a tool is predicated on frequent interaction with your fans. Myspace offers similar features, although its popularity has been overtaken by Facebook.

While Facebook works less well with Twitter than blogs, it can still be an important part of a social media strategy. A Facebook page can serve as an adjunct to museum websites that lack easy interactivity, and your presence there will delight visitors who want to declare their allegiance to you on their own Facebook profile.

*Sharing photos and video:* Incorporating links to photos in your tweets adds value for followers in a culture that is increasingly visual. Applications such as Twitpic make it easy to add photos to your Twitter feed; others, like Tweetdeck, are one-stop apps for sharing text, video and photos and automatically shrinking links to save characters. You may want to add a link to direct followers to your museum's dedicated page at a more multipurpose media-sharing site like Flickr or YouTube, the two that are currently the gold standard for photo- and video-sharing respectively. Photos and video can serve an educational purpose, as visual aids to a feed about an object or collection, for example. Photos and video can add impact to a promotional campaign about an exhibit or program series. The Tacoma Art Museum has solicited the participation of followers in compiling photo collections around exhibit topics, such as *Day of the Dead* or textual illumination, for example.

*A note about video:* Because video is so multi-sensory – combining audio (narration and/or music) and visuals, and it can be produced – it is uniquely suited for documenting and sharing museum projects. With video, museums can document and share such behind-the-scenes projects as

object conservation and exhibit installations that visitors ordinarily would not be privy to, which is a particularly exciting potentiality for grant-funded projects. With low-cost web-quality video cameras, museums can upload video to share events and programs practically in real time.

*Wikis and dedicated social networks:* Hosting sites like Ning or Wiggio now make it easy to create password-protected social networks with Facebook-like capabilities (chat room, email subscriber groups, photo- and link-sharing, folders). Wikis are more technically complex versions. Such exclusive sub-networks can be created from among like-minded cohorts of your Twitter followers to facilitate crowdsourcing, crowdfunding, or time-limited interaction around a particular exhibit or initiative.

In thinking more broadly about the implications of new media for changing museums from top to bottom, it is worth considering the Smithsonian Institution's *Smithsonian Commons* initiative, the part of the organization's strategic plan which represents *a new part of our digital presence dedicated to stimulating learning, creation, and innovation through open access to Smithsonian research, collections and communities.*<sup>3</sup>

Primarily an internal document for now, the *Web and New Media Strategy* anticipates that

*Smithsonian Commons* will experiment with ceding some control over SI content (images, text, and research) through pilot projects and prototypes designed to *test and refine business models and impact on mission and audiences*.<sup>4</sup> The Smithsonian's strategy represents the working-out – literally, because the document is being refined on a wiki – of the multiple considerations when developing a social media strategy on a grand scale. Most telling is an appendix that categorizes feedback from participants who helped formulate the strategy. What's out: *curators as experts and stability/stodginess*. And what's in: *curators as collaborators and brokers and change*.<sup>5</sup>

The diversity of capabilities among social networking platforms creates endless opportunities to use Twitter as one tool to further any museum's marketing, educational, and curatorial strategic goals. Twitter is an easy way to start your social media experiment; once you are satisfied with its place in your strategy, experiment with pairing it with other tools.

Social media policy or handbook?

As your museum staff and board contemplate how Twitter and other social media platforms complement your larger strategic goals, questions may arise

about the risks involved in experimentation. Social media is exciting because it is full of possibilities and open to contribution and interpretation, and social media is scary and potentially damaging for the same reasons. Most museums are so new to web 2.0 that they have not yet developed internal policies governing staff participation in social media. Some organizations will be comfortable with the notion that common sense should prevail – that you should not post anything you would be ashamed to have your mother or your boss read, as one participant described it. Others will be more comfortable with a formal written policy or handbook guiding staff in judicious use of these tools.

Jennifer Van Grove succinctly outlined what a good web 2.0 policy can accomplish for an institution and staff: *it sets the foundation of your expectations, empowers your employees to tweet or blog without fear, rewards social media problem-solving, and educates staff on things to avoid in both personal and professional status updates.*<sup>6</sup> Good social media policies address issues of transparency, moderation of language and viewpoint, and restrictions on proprietary and confidential information. Better social media policies include reminders about copyright and fair use law and encourage social media value.

The good news is that there are numerous models available on which to model your own policy, since in this area for-profit companies are way ahead of museums. Some demonstrate that policies can be formulated that mitigate possible damage without depersonalizing the Twitter feed or unreasonably squelching the creativity of staff.

The best policies acknowledge that an organization cannot control what will be written about it on the Internet, so instead they aim to encourage behavior that is so exemplary, it does not provide a toehold for criticism. These policies start by asking staff to be clear about who they are and what their role is in the organization, and not to write outside their area of expertise. They ask staff to be respectful of diverse opinions, to be moderate in their language and opinions, and to step back from any confrontation that may tend to reflect poorly on themselves as professionals and the organization as a whole. These policies start from existing ethics and confidentiality policies and build up to the special circumstances inherent in social networking. Museums should of course consult their legal counsel for guidance in formulating a written policy consistent with local, state, and national law.

Intel's social media policy is widely cited as a

model that seeks to protect the company's brand and reputation while not overly restricting individual voices. It includes *Rules of Engagement* and *Moderation Guidelines*, written in simple clear language. Intel's policy mandates that employees *be judicious, be transparent, and write what you know*. It also recommends that social media participants *add value, be a leader, and create excitement*. In short, the policy is a surprisingly salutary approach to web 2.0 interaction from a giant corporation.<sup>7</sup> IBM's *Social Computing Guidelines* are similarly comprehensive and common-sensical, with the addition of a strong company statement acknowledging the value of social media.<sup>8</sup>

When social media policies are formulated in response to a complaint or perceived crisis, they can be overly restrictive or punitive. For example, instituting any approval process for Twitter posts would be so excessively unwieldy that it would defeat the purpose of participating at all. Acknowledging the sometimes negative cast of many social media policies, Nina Simon recommends that museums that have determined that the use of web 2.0 will be an ongoing part of their communications and marketing strategies should develop a handbook rather than a *policy*. In such a handbook the primary aim would be facilitating social media activity

among museum staff. Such a handbook might include guidelines, resources, and a style guide, with approved logos, photographs, and detailed information about the availability of out-of-copyright graphics and photos. A handbook might also include reminders about appropriateness, approval processes (if necessary), and copyright and fair use issues. Staff may wish to set up a wiki to create such a document collaboratively, one where staff could upload links to online projects.<sup>9</sup>

When promoting your involvement in social media on your website, you may want to post a condensed version of your policy or a PDF of the complete policy. The New York Council of Nonprofits, for example, has posted its brief Twitter policy on their Privacy Policy page:

*The New York Council of Nonprofits is not responsible for the content of its Twitter followers or of those that we are following. NYCON makes a reasonable best effort to follow feeds of individuals or entities that consistently provide information about non-profit governance, management, policy, technology or other relevant topics. Due to the dynamic nature of social media tools like Twitter, NYCON cannot guarantee the appropriateness of the content of its followers or of those that we follow.*<sup>10</sup>

When directing your website visitors to your various social media efforts, you may also want to provide contact information for staff responsible for dealing with questions, suggestions, or complaints. In this way your museum's *Get Involved* page now serves as a sort of a clearinghouse for your involvement all across the internet, helping users explore your web 2.0 involvement, explaining your policies, and allowing them to contact you directly for more information.

When worlds collide

Whether they opt for strategies, policies, or handbooks, organizations involved with social media are grappling with the challenges inherent in the democracy of knowledge that the internet has created. Like it or not, the success of web 2.0 has made it possible for information about your museum – accurate, inaccurate, laudatory, or critical – to travel around the globe in the blink of an eye. As museum professionals our instinct to avoid controversy can, if we allow it, discourage us from trying these new tools. But fear of change, however well-intentioned, ensures that your institution will have a lot of catching up to do when social media is an unavoidable component of how museums do business. More importantly, as Andy Beal and Judy

Strauss, the authors of *Radically Transparent*, point out: *if you are not the topic of online conversation this may indicate a bigger problem: you have no reputation at all because no one cares.*<sup>11</sup>

Beal and Strauss recommend a more empowering approach to the internet's potential for harm: adopting radical transparency. Becoming radically transparent means *being open and honest online, admitting mistakes, engaging stakeholders in discussions about you and your brands, and even revealing your internal processes.*<sup>12</sup> It requires sincerity and a willingness to really listen and respond to feedback (positive and negative), knowing that criticism will ultimately strengthen your organization. It turns out these are the best values of any communication, although we may not be used to exercising them with millions of strangers.

If your museum is aiming for radical transparency, avoiding controversy and criticism become beside the point; instead the aim is to maximize the benefits to your museum from the (sometimes) rough-and-tumble of frequent and open interaction from cyberfriends who care about what you do. Beal and Strauss offer numerous examples from the corporate world that demonstrate that *control* of your reputation and your brand is no

longer possible, if it ever was. A better goal is *reputation management*, the process of familiarizing yourself with what people are saying about you and responding quickly and honestly. Online reputation management is a core life skill, or soon will be, the authors suggest, and your institution's reputation for openness and honesty, developed over time, becomes the first bulwark against online damage.<sup>13</sup>

A real world example makes this point. Particularly on Twitter, being an active participant in social media means constantly remembering there is a real human being behind every avatar. Well, maybe not behind every avatar, but it is safer to think that way. The following example illustrates the point. After an important exhibit opening in the life of our museum, I tweeted an offhand observation on our museum feed about my surprise that there were more bloggers who covered the event than traditional media. The Twitterer from the local newspaper was surprised to learn that there were multiple bloggers active in his city, and asked who they were. One of these bloggers, nonplussed at this reporter's unfamiliarity with local bloggers, reposted the exchange, identifying me by name and going further to suggest that the local paper was insufficiently concerned about what was going on in

the community. This blogger had extrapolated from my tweet a criticism of the local newspaper that I had never intended, and put it online connected to my institution.

This misunderstanding, resulting from the tension between real people operating in the real world and those operating in the virtual world, required some damage control on my part. The local paper had always been supportive of our museum's news and events, as had the bloggers, and I reached out quickly to reassure both – publicly, online – that I understood the pressures on both, that I believe that there is plenty of room for both traditional journalism and blogging, and that I appreciate all coverage the museum gets. The newspaper editor was very gracious, and in fact instituted links on their web site to those bloggers covering local news and events. My off-the-cuff tweet about trends in journalism took on a whole new dimension in a local context in which all the players knew one another, and the potential for damage to the museum's reputation was real. But the fact that I was monitoring the museum's online reputation and responded quickly averted any larger crisis.

A very helpful way to monitor what is being said about your museum on the internet is to set

up a Google Alert. Google alerts provide you with frequent emails pointing you toward mentions of your institution, with a few lines from the website and a link that you can follow up. Google Alerts capture mentions on blogs and other non-password-protected forms of social media, as well as traditional media and other websites. Not only do these alerts allow you to respond immediately to any potential harm from inaccuracies or misrepresentations about your museum, they also allow you to be an active social media participant by commenting on blog posts about your museum or thanking those who review you positively.

This discussion of Twitter and social media strategy and policy should reassure you that the benefits of active participation online far outweigh the disadvantages. Imagine any other low-cost doable way you can re-energize museum operations with ideas from potentially hundred or thousands of people who are excited about what you do and what your museum stands for!

## Notes

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# **Measuring, Analysing and Reporting**

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We're still in the very early stages of defining success and determining best practices for social media measurement. If you've already dipped your toe in the Twitter water, you know that riding the swells can be exhilarating. But the dizzying pace and loose structure can also make you feel unanchored, aimless, adrift. An evaluation plan can help you set the course, steer the ship, and eventually earn your sea legs. (Inspiration for the maritime metaphors is courtesy of Twitter's *failwhale*.)

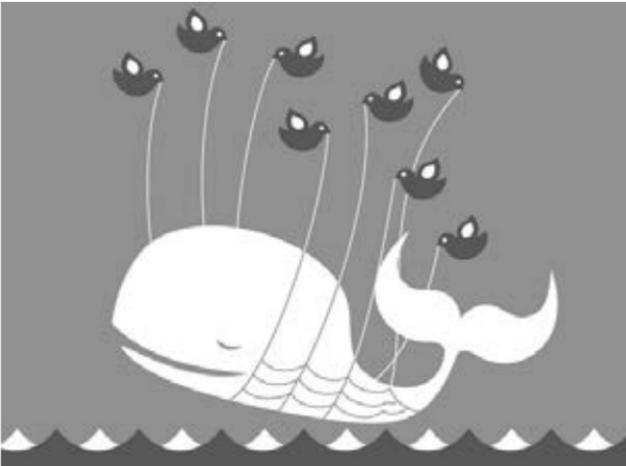


Figure 1: Users see this image of the failwhale when Twitter experiences an error or is overloaded. Do you have “permission to fail”? Failure can be a valuable learning and evaluation tool.

## The challenges

The first challenge for anyone using Twitter



Figure 2: The need for useful, actionable metrics.

is figuring out what you want (and can realistically expect) to gain from it. The second is measuring movement towards those goals using data that are accurate and relevant. If you've ever used a third-party Twitter analytics tool, you've probably experienced bewilderment in trying to interpret a metric that is clear as mud – what do *clout*, *amplification score*, *link quotient*, or *influence ratio* really mean? These flashy stats are easy enough to acquire – you typically visit the (often free) analytics site, type in your username (many don't even require a password), and watch it spit out your data. Gathering metrics that are actually useful and actionable is a different story. (Fig. 2)

As you start gathering metrics, remember that both quantitative and qualitative data are important to your evaluation plan. Quantitative data can help you understand the *degree* of engagement (i.e. how

many?) but that's only one piece of the puzzle. Qualitative data helps you understand the *kind* (i.e. positive? negative? neutral?) of engagement. With Twitter, both types of data are abundant and easy to access. What's harder is overcoming information overload and making analysis both manageable and useful.

Another challenge for any evaluation activity is avoiding measurement for measurement's sake. You want to do the least amount of work needed to gain actionable insights. You want to spend your time acting, not analyzing. Having a plan for data gathering and analysis will help you maximize your time. The plan outlined below is described with Twitter in mind but will be most worth the effort if you use it to integrate evaluation of all your social media objectives.

Getting to better in six steps

Twitter is about keeping it short and simple. Why should your evaluation plan be any different? The six steps outlined below will help you maintain a constantly improving presence. If you're really tight on time, there's a *CliffsNotes* version (Fig. 3).

1. **Listening:** What are people saying about you? What aren't people saying about you but you wish they were?
  - Search for your name and phrases related to your museum.
2. **Benchmarking:** Where are you now? Where are your peers?
  - Save baseline data: followers, @ replies, RTs, clickthroughs.
  - Make a list of 3-5 peer institutions. Record their metrics for followers, RTs, etc.
  - At regular intervals, record this data again (for you and peers).
3. **Thinking about goals:** Where do you want to go? What is your definition of success?
  - Jot down a few (4 or less) goals. Consider aims related to influence, engagement, relationships, and effort.
4. **Measuring:** What data should you collect? How can you collect it?
  - Record measurements of input (the effort you put in) and the response (feedback you receive).
  - If you can, use Web analytics and audience research (e.g. surveys) to understand how your Twitter efforts are impacting behaviors on your website and in the offline world.
  - Remember that data with context is more useful (e.g. change over time, percentage of how many).
  - Perform a content analysis – use a random sample or tweets from a small time period and categorize them by message type, tone, or topics.
5. **Analyzing:** How to make sense of the data? What kinds of analysis should you focus on?
  - Select key metrics for influence, engagement, relationships, and effort. Focus on the need to know not the nice to know.
6. **Actionable reporting:** What does it all mean? What is the best way to share this information? What are you going to do?
  - Determine your direction. Develop SMART objectives and action steps.
  - Create a dashboard that clearly states your objectives, trends, and next steps. Share your successes (and improvement needs) with decision makers and other colleagues.

Figure 3: Getting to better in six steps (*CliffsNotes* version).

### Step 1: listening

They say the most brilliant conversationalists are actually brilliant listeners. Since Twitter is all about dialog it makes sense to begin by listening. In their book, *Putting the Public Back in Public Relations: How Social Media is Reinventing the Aging Business of PR*, Brian Solis and Deirdre Breakenridge advise that: *Measurement is most useful when you have something to benchmark against. Running a current audit of the state of your brand perception helps you create an accurate baseline and also reveals the opportunities for engagement.* In other words, what are people saying about you and what could they be saying? Where are you now and what is in the realm of possibility?

There are a number of ways to monitor conversations in social media, including free and simple options as well as expensive and sophisticated tools. The most basic way to listen is to run a keyword search on Twitter's own site: <http://search.twitter.com>. To find conversations that are already taking place about you, include a mix of phrases (use quotes) as well as individual words that might appear in any order within a tweet. Search for:

- Your Twitter username (if you already have one)
- Your museum's name (include abbreviations

and variations, e.g. “Smithsonian American History,” NMAH, “National Museum of American History,” American history museum. )

- Exhibition titles
  - Key objects (e.g. “ruby slippers”)
  - Your topic focus (e.g. “U.S. history,” “American history,” transportation, archives)
  - Hashtags (e.g. #history, #invention, #si20)
- (See Step 4 for more tips on searching Twitter.)

Analyze your mentions (tweets that reference you). Choose a way to save tweets and then tag or categorize them. For example, bookmark individual tweets in [del.icio.us](http://del.icio.us) (each tweet has its own unique URL<sup>1</sup>, click on the timestamp to see it) and give them tags that are meaningful to your museum (e.g. positive, negative, question, comment, locomotive). By looking at how many tweets are associated with each tag, you’ll get a sense of conversation density. If you’d rather do it offline – or if you find a very large number of mentions – a spreadsheet might fit the bill better. Make listening an ongoing part of your Twitter efforts.

## Step 2: benchmarking

Goals (Step 3) are about knowing where you want to go and how you will know if you're successful. But how can you know where to go unless you already know where you are?

*Baselines:* Your listening activities have given you a sense of what the conversation looks like. This is your baseline or starting point. You may have been tweeting for some time before you realize you forgot to capture your baseline – that's OK! Just measure it, record it, and call it your baseline – no matter when you start recording. You've got to start somewhere.

If you haven't yet set up a Twitter account, your baseline data will be comprised of the number and types of mentions. If you're already active, you might also capture:

- number of followers
- number of @ replies
- number of RTs (retweets)
- number of clickthroughs on links (tip: use a link shortening tool to track these)

Other baseline data to consider: search engine rankings for particular terms (e.g. when you Google search your museum name, you're result #1; when you search "Julia Child" you're result #4) and website

traffic (e.g. visits, unique visitors, referrers from Twitter). Your social media activities can have wide-ranging impacts on your web presence. Record those things that you care most about moving the needle on.

*Benchmarks:* If a baseline marks the line in the sand, a benchmark helps you know where something is in relationship to that line. They are points of reference, standards by which your efforts can be measured or judged. Make a list of 3-5 peer institutions on Twitter, including one with stats that blow everyone else out of the water (e.g. MoMA or The Women's Museum)<sup>2</sup>. GraphEdge is a good tool for discovering who else your audience is listening to; it presents a list of other users ranked by what percentage of your followers also follow that account. For each peer on your shortlist take a look at their follower numbers, how actively they're tweeting, etc. Capture only the details you want to focus on in your own efforts. Save this data as a benchmark for comparison and to help you develop realistic objectives.

The next time you measure your own statistics – say, one month from now – you'll record them as new benchmarks. You can then compare your new data points with your peers' data as well as your own

baseline. Recording benchmarks at regular intervals (e.g. monthly, quarterly) makes measuring progress – and extrapolating into the future – easier.

### Step 3: thinking about goals

Goal-setting can be a tricky business. You want to be realistic so your organization has an opportunity to succeed. But you also don't want to set your sights too low. Social media provides revolutionary possibilities – think big! (But keep your number of objectives small.)

When you're brainstorming goals, consider not *What can I do on Twitter?* but *How can Twitter help me achieve the museum's mission?* Ask: *What is unique about Twitter?* and, more importantly, *What can I bring to Twitter that is unique?* If it's true that Twitter is awash in navel-gazers and spam-loving marketers, museums have a fantastic opportunity to provide everyone else with fresh, exciting content and distinctive modes of engagement.

*The difference between goals and objectives:* Amber Naslund, Director of Community for social media monitoring company Radian6, explains the difference between goals and objectives in clear terms: *Goals are your general intentions, the big picture aims. Your objectives are the outcomes that represent*

*achievement of that goal. Things you can actually observe. In order to be classified as an objective, something has to be measurable.*

Your task in Step 3 is to develop a few (four or less) big picture goals. You will learn a lot about your museum's effectiveness on Twitter *after* you go through your first round of measuring and analyzing data. When you get to Step 6, you'll have a fuller sense of context and will be better equipped to articulate objectives.

*Four ways to classify activity and purpose on Twitter:* Many frameworks exist for organizing social media analysis – choose one (or create your own) that best presents how Twitter efforts relate to your museum's mission and values.<sup>3</sup> The framework presented here (Fig. 4 opposite) offers four genres of activity that a museum might wish to measure or improve on: influence, engagement, relationships, and effort. You will learn more about analyzing measurements in Step 5.

#### Step 4: measuring

You already know that you don't need to measure everything that's measurable. The list of measurements outlined below is a menu for you to select from – don't eat everything on the menu or

Activity genre	Example goals	Example measurements
<b>Influence (Visibility)</b>	Build buzz, awareness of your exhibitions, programs, building amenities, and brand. Establish yourself as a thought leader, authority, or expert. Disseminate news. Drive traffic to your website or blog. Increase museum attendance.	Followers Retweets Clicks (Web traffic)
<b>Engagement (Exchange)</b>	Participate in conversations where you previously did not have a voice. Shape the conversation. Elicit feedback. Collaborate with your audiences. Collaborate with your peer institutions. Pick up new ideas. Foster appreciation of your collections. Provide answers. Solve problems.	Tweets sent by you Mentions @ replies Types of content (Q&A; today's fact) Behavior of visitors referred to website from Twitter
<b>Relationships (Being human)</b>	Have fun. Convey that the museum is approachable and accessible. Share your museum's #1 asset: the smarts and passion of your staff. Build relationships with key individuals. Build relationships with key audiences. Build better relationships. Build community.	Satisfaction ratio (positive minus negative mentions/total mentions) Unique senders/RTers Followers with greatest influence Likelihood to recommend Lists Favorites Unfollows
<b>Effort (Resources spent)</b>	Increase efficiency and effectiveness of staff time spent on Twitter	Total tweets sent Tweets sent per day Tweet density (hourly) Time spent creating new content Time spent engaging with followers

Figure 4: Four ways to classify activity and purpose on Twitter.

you'll be sick.

*Choosing tools: Beware data puking!* As web analytics guru Avinash Kaushik puts it: *Most Twitter analytics tools just (...) find numbers that can be computed and then proceed to puke at you as many as they can find, with wanton disregard for the value being provided or outcomes being measured.* Indeed, the plethora of opaque metrics available to you – like *social ratio* and *passion score* – can make you dizzy. Focus on the metrics that will help you achieve your goals.

In his excellent *Web Analytics 2.0* chapter, *Measuring the New Social Web*, Kaushik writes: *One of Twitter's great gifts to humanity is its open API, which has fostered hundreds of applications that provide metrics.* While his praise might seem hyperbolic, the number of third-party tools created to measure and interact with Twitter is truly astounding. The variety and the cost (usually free) are the upsides of this phenomenon. The downsides are systems which output metrics that aren't always accurate or meaningful and applications that seem to go as quickly as they came.

How do you decide which of the several dozen Twitter metrics tools to use? As they say, there many ways to peel an onion. The tables below match suggested tools with specific kinds of data gathering.

See the references for additional tools.<sup>4</sup>

*What, where, how:* So, what data should you collect? And where and how can you collect it?

*What to measure:* In order to prioritize your social media efforts and become more efficient, you'll need to measure not only audience behaviors but also your own. At the end of the day, you have more control over what you're doing and saying. (Figs. 5-7)

*Where to measure:* The people you're interacting with on Twitter don't live and breathe on Twitter 24/7 (at least we should hope not!). If you can, use web analytics and audience research to supplement the data you gather on Twitter; this will help you better understand how Twitter efforts are impacting behaviors on your website and in the offline world

*How to measure - behavior analysis:* There are several kinds of behavior you can count on Twitter: follows, unfollows, mentions (including recommendations), @ replies, RTs, and clicks. When you're collecting data, remember that metrics with context are more useful. The table at Fig. 8 provides an example.

*How to measure - content analysis:* Behavior analysis tells you what people are doing and the degree to which they're doing it. Content analysis tells you what they're actually saying and whether the tone is positive, negative, or neutral.

Input: effort	Data points	Tools
Resources	How many employee hours spent on Twitter?	Spreadsheet
Content	How often do you tweet? When do you tweet (day/time)? What percentage of the tweets you send are original content? @ replies? RTs? What percentage of tweets you send contain X (e.g. links, fun facts, event announcements).	Spreadsheet Twitalyzer TwitterFriends Klout SociafyQ
Triggers	Have you run any special campaigns or calls to action? What are the dates? Have you changed your Twitter background design? Have you changed keywords in your Twitter bio? Are there external events that might trigger a change (e.g. exhibition opening, news story)?	Spreadsheet Google Analytics Annotations

Figure 5: Measuring input – the effort you put in.

Before you can analyze content you'll need to collect your sample. Use the same methods you used in Step 1 (Listening) to gather tweets that reference your museum. For more granular control of results, try Twitter's advanced search<sup>5</sup> (Fig. 9) which allows you to specify words, people, places, dates, attitudes, and whether or not the tweet contains links. You can filter out irrelevant results by using the minus sign in your query (e.g. *-root* when searching for *beer*). Keep in mind that Twitter restricts the size of your search by placing a date limit (approximately 1.5 weeks)<sup>6</sup> on the updates you are allowed to search. Other third-party tools offer the ability to conduct an advanced search, save and export results, receive updated results via email or RSS, and more.

The effort to read, analyze, and categorize a large set of tweets can be time- and resource-intensive. To combat this problem, automated sentiment analysis tools (Fig. 10) have been built to do the work for you. Several options are available, including the pricey (e.g. Radian6, Scout Labs) and the free (e.g. Tweetfeel, Twendz, Twitrratr); however, there is much debate about their accuracy and usefulness. Sarcasm and slang are just two of the challenges for computers trying to decipher

Response: feedback	Data points	Tools
Resources	How many employee hours spent on Twitter?	Spreadsheet
People	Followers Unfollows	Twittercounter GraphEdge
Actions (quantitative)	RTs Clicks Conversions	Daily RT Link shorteners (e.g. bit.ly, ow.ly) Campaign and goal tracking (e.g. Google Analytics)
Actions (qualitative)	Mentions @ replies Recommends	Twitter clients (e.g. HootSuite) or alerts (SocialOomph, TweetBeep) Hashtag searches (e.g. #ff, #followfriday)

Figure 6: Measuring response – the feedback you receive.

Zone	Data points	Type
Social networks	What are people doing on Twitter? What is the tone or sentiment of what they're saying?	Behavior analysis Content analysis
Websites	What behavior is exhibited by people who visit our website when they are referred from Twitter? How does this behavior differ from other audiences?	Web analytics

Figure 7: Where to measure.

Usefulness	Data points	Use	Tools
Good: The Basics	# of followers	Provides a rough measurement of awareness and potential influence	Twitter
Better: The Ratios	Unique RT senders Unique @ reply senders	Gives you a better sense of how many people (followers and nonfollowers) are actually engaging with you and your content	Klout
Best: The Trends	# of followers/ time Unique RT senders/ time Unique @ reply senders/ time	Shows you change in engagement and reach over time	Twittercounter Calculate rates and ratios using a spreadsheet

Figure 8: Measuring behavior.

human attitudes. For example, how will a non-human interpret the tweet *This exhibit never gets old!?* If you decide to do the analysis yourself, the census approach is probably unrealistic. Use a random sample or select a short time frame and analyze everything from that period. Categorize the tweets by tone, topics, or types of tweets. Remember, you're trying to do the least amount of work required to

Figure 9: Twitter's advanced search feature.

gain actionable insights.<sup>7</sup>

*How to measure – web analytics:* What do Twitter users do after they click a link in one of your tweets? This information will be important to you if your goals include driving more traffic to your website or encouraging particular behaviors on your site (e.g. email newsletter signup). To capture this data, first use your site's web analytics tool (e.g. Google Analytics<sup>8</sup>, WebTrends) to segment visitors that are being referred from Twitter. For that segment of web visitors, consider tracking the following data

Message type	Tone	Topics	Tools
Asking for information or help.	Positive Negative Neutral	Exhibitions Building amenities	<i>Categorizing:</i> Del.icio.us bookmarks and tags; spreadsheet.
Answering a question.		Costs	<i>Archiving:</i> Twistory, BackupMyTweets, Tweetsaver.
Sharing an opinion or making a suggestion.		Kid-friendly features	<i>Sentiment or tone Analysis:</i> Tweetfeel, Twendz, Twitrratr.
Expressing praise, agreement, or satisfaction.			
Expressing criticism, disagreement, or dissatisfaction.			
Reposting content.			
Making an observation.			
Making a joke.			

Figure 10: Sentiment analysis.

and comparing it to web visitors coming from other site referrers:

- Visitors (How many people?)
- Visits (Do they make repeat visits?)
- Pages viewed (Do they view more pages?)
- Time on site (Do they stay longer?)
- Bounce rate (Do they leave right away? Can

you optimize your landing page to keep them longer?)

- Conversions (Do they make it to your goal page – such as a subscription confirmation or download page – at a higher rate?)

If web analytics data are crucial to your evaluation plan, you'll need to take some extra steps to make your tracking more accurate. By looking at site referrer data in your web analytics tool, you will see visits coming from Twitter.com. Unfortunately, traffic from desktop and mobile Twitter clients (e.g. HootSuite, TweetDeck, Tweetie) does not register as a Twitter referrer because traffic is not coming from a browser; instead it is recorded as *direct traffic*. The same is true for traffic that comes from RSS feeds. In order to capture information about these visitors on your site, consider appending your URL with tracking parameters (e.g. with Google Analytics URL Builder, you can specify campaign, source, medium, and name). Make sure to do this *before* you shorten your URL.

*How to measure – audience research:* You can capture a lot of qualitative data through content analysis. But if you're looking for information that can't be gleaned from observing what people do and say *through Twitter* you will need to use audience research tools

Audience	Type of measurement	Tools for measurement
Twitter followers	Twitter surveys	Twitpoll, SocialToo
Non-followers	Online surveys	SurveyMonkey, SurveyGizmo, ForeSee Results
Museum visitors	Surveys, interviews	Paper-based, audio recorder

Figure 11: Audience research tools.

(Fig. 11). Collecting data from different audience groups allows you to compare the impact your Twitter efforts are making on attitudes and actions.

Things you might investigate with audience research:

- What are the audience's expectations? Are they being met?
- Who are they? Collect demographic data as well as information about whether they are members or donors etc.
- How have the museum's Twitter efforts influenced perceptions?
- What kind of follow-up actions have been taken (e.g. visited the museum, made a purchase, became a member)? Do these actions have any relationship to exposure on Twitter?

### Step 5: analyzing

You've collected and measured and categorized to your heart's content. Now, how do you make sense of the data? How do you pull it all together?

*Selecting key metrics:* A metric is a standard measure that quantifies a trend or characteristic and helps you assess performance (e.g. new followers). When you're elbow-deep in data, keep in mind Avinash Kaushik's advice to focus on the *critical few*. Essentially, this is the process of separating the *nice to know* metrics from the *need to know* metrics. Remember, you don't want to suffer from analysis paralysis. Measure what you need to and then spend your time where it counts: on Twitter!

When selecting your critical few, Kaushik counsels that you make sure they meet the following criteria:

- echo organizational goals (i.e. are relevant);
- provide context;
- are easy to understand (i.e. are uncomplex);
- lead to action (i.e. are instantly useful).

*Analyzing influence:* Influence metrics are about awareness, message amplification, reach, and visibility. Are you generating buzz? Building brand awareness? If you tweet something of value, your followers will share it with their own networks,

thus extending the reach of your message. How many people are following you and how often you are being retweeted by those followers will have a major impact on both your reach and your audience growth. Key metrics for this activity genre might include the following.

*Analyzing influence – followers:* Keep an eye on how your follower numbers grow over time. Obviously, a growing number of followers (quantity) is good. More important, however, is gaining followers that are relevant and engaged with your content (quality). You might also pay attention to specific campaigns or events that led to a marked increase in followers (e.g. were you retweeted by an account with a huge number of followers? Was your Twitter feed featured in a news story?)

*Analyzing influence – retweet ratio:* To calculate retweet ratio, divide the number of retweets of your content by the number of tweets you sent. The closer you are to 100% (or more), the greater the reach of your content. Looking at which tweets were retweeted most gives you a sense of the kind of content your audience is most interested in sharing with their networks. Make sure when calculating number of retweets that you are including the various formats people use in their tweets (e.g. RT @username, via @

username, etc.). To compare yourself with your peers (regardless of their follower size), consider your ratio of retweets in a given time per thousand followers.

*Analyzing influence – clicks:* Link shortening tools (e.g. ow.ly) illustrate click trends over time and can help you isolate which tweets were most interesting to your audience. Are blog posts the most highly clicked? Fun facts?

*Analyzing engagement:* Engagement metrics are about conversation, exchange, interaction, and participation. Are you being a good conversationalist? Are you collaborating with your audiences? Are you answering their burning questions (or they yours)? The thinking goes that those who read, click, respond to, and share your tweets are your most engaged followers. Key metrics for this genre might include:

*Analyzing engagement – conversation ratio:* To calculate this metric, compare your total number of mentions to tweets sent. The closer you are to a 1:1 ratio, the more your activity on Twitter is like a dialog rather than a monolog. You might analyze this data to see how many questions you're asking versus answering and what kinds of tweets are generating the most response. Make sure you are performing qualitative analysis on the conversations

to determine that the engagement is positive.

*Analyzing engagement – percentage of followers who retweet:* To calculate this you'll need to take the number of unique retweet senders and divide that by the total number of followers you have. Remember, you want relevant people to follow you on Twitter. If the percentage of retweeters drops significantly over time, this might be a sign that you're not engaging your followers as well as you could or that you're gaining a lot of followers who are not relevant.

*Analyzing engagement – conversions:* The question you want to answer is, *How many people who clicked on a link in Twitter took a desired action?* The desired action might be a visit to your blog, subscribing to your newsletter, or becoming a member. Or you might simply want to compare how much time people referred from Twitter spend on your site versus time spent by those who come from elsewhere on the web. Are your Twitter followers more engaged than those who find you in a Google search?

*Analyzing relationships:* Relationship metrics are about loyalty, satisfaction, and being human. Are you building relationships with key audiences? Are you able to solve problems and satisfy people on Twitter (not just your followers)? Just as you would nurture valued relationships in the offline world,

make sure you are giving proper care and feeding to your most loyal followers. Key metrics for this genre might include:

*Analyzing relationships - likelihood to recommend:* A recommendation is a good measure of trust and a strong relationship. You might start by looking at how many times your followers explicitly recommend you to their own networks (e.g. search #followfriday and #ff). Being added to a Twitter list is another indicator of trust and loyalty (unless you're put on a list of places to avoid).<sup>9</sup>

*Analyzing relationships - satisfaction score:* If customer service is important to your organization, you'll want to calculate satisfaction score by subtracting the number of negative mentions from the number of positive mentions you receive and dividing that by the total number of mentions. A higher percentage could indicate a more satisfied public.

*Analyzing relationships - churn rate:* Look at the number of followers you gain or lose in a given time period. There is a churn rate associated with many kinds of communication (e.g. email newsletters) so keep a closer eye on the trend than the absolute number. Your churn rate trends are a reminder to not just focus on growing the size of your list but

to make sure that you're reinforcing value for those already on your list.

*Analyzing effort:* Effort metrics are about making the most of the time and human resources you put into Twitter. Are you being efficient and effective? Key metrics for this genre might include:

*Analyzing effort - tweets sent:* How many tweets do you send on an average day? Does the number (or day of the week, or time of day) affect the response you get? You will need to determine the appropriate amount of time to spend on Twitter; the quantity and quality of response you receive should be a key factor in this determination.

*Analyzing effort - time spent:* Keep rough tabs on how long it takes to create new content for Twitter as well as how much time it takes to seek out and respond to people. Is one employee responsible for all Twitter activity or can you spread the workload around the museum?

#### Step 6: actionable reporting

Now that you've completed your analysis, it's time to show how your evaluation informs what the museum should do with the data. What is the best way to share information about your successes

and highlight the areas where you need additional support?

*Acting on your findings:* You should have a good sense of what you're doing well and what needs improvement. Armed with this information you should be better equipped to answer questions like:

- What is the museum likely able to accomplish by using Twitter? (i.e. why the heck are we doing this?)
- How can you foster success and growth?
- Is it time to try something new?
- How will you keep your content fresh and your followers engaged?
- Where will Twitter fit in your priorities?

As you think about the answers to these questions, consider what your objectives should be and begin drafting action steps to meet those objectives.

*Get SMART – drafting objectives:* During Step 3, you sketched out a few rough goals to get you started; now is the time to revisit those goals. In order to turn your analysis into action, you need to develop measurable objectives and put them through the SMART test:<sup>10</sup>

S: specific, significant, simple

M: measurable, meaningful, motivational

A: achievable, agreed upon, action-oriented

R: relevant, rewarding, results-oriented

T: timely, tangible, trackable

The purpose of the SMART framework is to ensure that your stated objectives are clear about what you want to do, how you'll quantify it, and what your time frame is for achieving it. Because social media is developing and expanding at such a rapid rate, your objectives should be relatively short-term and you should measure them on a monthly or quarterly basis. Note that many third-party tools show stats only for the last 30 days, so you'll want to check and capture data on a regular basis (even if you don't analyze it until later).

Examples of SMART objectives:

- Increase followers to 10,000 by June.
- Convert 10 followers to donors by the end of the year.
- Increase traffic to the blog from Twitter to 1,000 visits per month.

*Dashboards:* A dashboard report can help you visualize and track trends, showing how activities align with your goals. Dashboards provide an effective way of answering questions quickly and concisely: What's

changed? What can I act on? What should I pay attention to first?

In his chapter, *Building the Action Dashboard*, Avinash Kaushik recommends creating a one-page dashboard displaying your critical few metrics. Dashboards, he says, should never report a metric without context. Ever. Insights should jump out rather than questions.

The first step in creating your dashboard is to state your objectives clearly. Alongside each objective you might include:

- a trend graph of a key metric (e.g. follower growth over the past six months);
- a color representing the health of the metric (e.g. red/yellow/green);
- examples of qualitative data (e.g. the text of a positive @ reply; the content of the most retweeted item);
- action steps to be taken to move the dial.

(See my National Museum of American History case study chapter for a sample dashboard report.)

Unless your museum is using Twitter as its sole social media outlet, you should consider integrating all of your social media analysis and reporting into one framework. A dashboard that quickly and clearly



Figure 12: Twitalyzer's dashboard is pretty to look at but doesn't illustrate what you're supposed to *do* next.

demonstrates the success of your social media efforts as a whole will be hugely useful in determining how your museum values (and allocates resources to) those activities. You also might decide to use more than one dashboard – one that is detailed for the people closest to the work itself and another that is a rolled-up synthesis for senior decision makers.

*Revisit and rethink:* By integrating evaluation and learning into our everyday work, we can change course quickly and midway, constantly improving our efforts. Your reporting helps steer the ship in the right direction, but don't forget to revisit your evaluation plan itself. Do your goals need to be adjusted? Are you measuring too much or too little? Are there more efficient tools available? As social media evolves, so too will the ways we think about the role it can and should play within our museums.

*Social media is about people, not numbers:* Evaluation reminds us to put our visitors (not ourselves) at the

center of our work. Joseph Jaffe, president of new media shop Crayon, warns of the danger in looking at your social strategy as a checklist: *This can put too much emphasis on tangible metrics like the size of their Twitter and Facebook followings, losing sight of more important intangibles, like expressing empathy, listening and acting human.* Jason Falls, author of the *Social Media Explorer* blog, agrees: *The core reason social media programs are successful is because they're about people, not money. Look at the social media buzz words – community, conversation, dialog, sharing – all of them are people-centric, consumer-centric.* Don't abandon your instincts, emotional intelligence, or playfulness. Ideal outcomes like goodwill and loyalty are human responses to interactions with other humans, not calculators.

## Notes

1. See, for example: <http://twitter.com/danamuses/status/7611775699>
2. Check Jim Richardson's Museum Marketing blog for the latest stats on museums on Twitter.
3. For other frameworks, see: Kim; Kaushik, *Web Analytics 2.0*, 57-59, 266-270; Lovett; Solis and Breakenridge, 254-265.
4. For an analysis of Twitter analytics tools from a nonprofit perspective, see Leaman. Also see: Allen-Greil; Chinn; Singh. For the latest and greatest tools, see "Resources for news and insights on social media analytics."
5. Access Twitter's advanced search at <http://search.twitter.com/advanced>
6. Twitter's API documentation explains: "This limit is currently around 1.5 weeks but is dynamic and subject to shrink as the number of tweets per day continues to grow."
7. See Gemingrani for more tips on measuring topics and conversation structure.
8. For information on measuring goal conversion in Google Analytics, see: <http://www.google.com/support/googleanalytics/bin/answer.py?hl=en&answer=55515> For more on tracking campaigns in Google Analytics, see: <http://www.google.com/support/googleanalytics/bin/answer.py?hl=en&answer=55578>
9. MustExist is an excellent tool for analyzing Twitter lists: [http://www.mustexist.com/list\\_tags](http://www.mustexist.com/list_tags)
10. There are many variations on the SMART framework for project

*management. These are my favorite terms. Here's another model from Project Smart: <http://www.projectsart.co.uk/smart-goals.html>*

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**Resources for news and insights on social media analytics**

*Mashable*, “world’s largest blog focused exclusively on Web 2.0 and Social Media news,” [www.mashable.com](http://www.mashable.com)

*Social Media Today*, “moderated business community for the web’s best thinkers on Social Media and Web 2.0,” [www.socialmediatoday.com](http://www.socialmediatoday.com)

*SmartBrief on Social Media*, “the best news and insights on the business of social media,” [www.smartbrief.com/socialmedia](http://www.smartbrief.com/socialmedia)

Beth Kanter’s blog, *How Nonprofit Organizations Can Use Social Media to Power Social Networks for Change*, <http://beth.typepad.com/>

# **Using Twitter For Research**

BECK TENCH

*Museum of Life & Science  
Durham, NC, USA*

Twitter is made up of two sources of real-time, searchable data: the *Twitterverse*, an aggregate of all users and all of their tweets; and those you follow, a subset of individually selected users whose tweets appear in your timeline.

Individually and combined, these two datasets can be used to research your audience and your brand in powerful ways. In this chapter, we'll discuss:

1. how to talk Twitter's language so that you can:
2. turn the Twitterverse into a helpful dataset in order to:
3. better understand your museum's reputation and audience.

### Talking Twitter's language

The Twitterverse is fantastically searchable. Since its mid-2008 purchase of Summize, a popular third-party tool that used Twitter's API to query tweets, Twitter comes complete with its own powerful Advanced Search Tool located at <http://search.twitter.com/advanced>. Tweets can be queried based on content, user, location, date, attitude and any combination thereof. Better yet, any search result query can be subscribed to via RSS, making the results available to a number of helpful and free tools.

Twitter contextual search	Boolean operator
All of these words – a standard AND query whereby Twitter will find tweets that match all the words you’ve searched for in any order. This is the default way to search in Twitter so there is no Boolean operator.	n/a
This exact phrase – a standard AND query, but in the exact order listed. A search for “science museum” would not return “Is there a museum about science in Durham?” but would return “Is there a science museum in Durham?” The Boolean operator is quotation marks surrounding the search phrase (e.g. “science museum”).	“ ”
Any of these words – a standard OR query whereby Twitter will find tweets with any of the words listed. A search for “science museum” will return tweets with just the word museum, tweets with just the word science and tweets with the words “science museum” in any order. The Boolean operator is the word OR (e.g. science OR museum).	OR
None of these words – a standard NOT query whereby Twitter will find all tweets that do not include the search term indicated. This parameter is best used in conjunction with other search parameters. A search for durham museum –art would find all tweets with the words durham and museum but exclude any that contain the word art. The Boolean operator is the minus sign in front of the word to be excluded (e.g. durham museum -art).	-
This hashtag – a search that references a specific content tag on Twitter. This search can be useful in filtering results when a hashtag is also a common word. The Boolean operator is # (e.g. #science).	#
Written in – filter your search by a list of languages that Twitter supports. This can be useful especially when you are searching for a phrase used rarely in one language but commonly in another. Quality of search results will vary as not all Twitter users tweet in the language they indicate in their profile 100% of the time. There is no Boolean operator for this filter, you must use the dropdown provided by Twitter on the advanced search page.	n/a

Figure 1: Contextual search.

Twitter user search	Boolean operator
From this person – Tweets from a specific Twitter user, can be combined with any of the contextual search options above. A search for <code>from:sciencemuseum OR from:artmuseum</code> would find tweets from either user. A search for <code>from:sciencemuseum -"summer camp"</code> would find all tweets from <code>@sciencemuseum</code> excluding any that mention the exact phrase "summer camp." The Boolean operator is <code>from:</code> (e.g. <code>from:sciencemuseum</code> ).	<code>from:</code>
To this person – Tweets that begin with an <code>@reply</code> . The Boolean operator is <code>to:</code> (e.g. <code>to:username</code> ).	<code>to:</code>
Referencing this person – Tweets that contain an <code>@reply</code> anywhere in the context of the tweet. The Boolean operator is <code>@username</code> .	<code>@</code>

Figure 2: User search.

The first and most obvious way to search Twitter is *contextually*. Contextual searches (Fig. 1) are good for finding out what people have to say about you, your exhibits and items in your collection. It's also helpful to understand buzz about an event you're hosting and can also be used to search your competition. Twitter offers the standard contextual search fare and accommodates Boolean operators.

Twitter is also searchable by user. User searches (Fig. 2) are good for alerting staff when users reference your username (or a competitor's). These searches can also be useful during periods of time when you have queried your followers and are expecting responses,

Twitter location search	Boolean operator
Near this place – Tweets near any location indicated by street address, zip code, city name, longitude/latitude coordinates or nickname. The Boolean operator is near: (e.g. near:Durham, near:27701, near:earth).	near:
Within this distance – A geo-radius of any length (miles or kilometers) from whatever is indicated in near this place. The Boolean operator is within: followed by any number and the abbreviation mi or km to indicate miles or kilometers (e.g. within:15mi or within:15km).	within:

Figure 3: Location search.

Twitter date/date range search	Boolean operator
Since this date – Tweets tweeted on or after a certain day. The Boolean operator is since: followed by a date in year-month-day format and can be used in conjunction with until: to create a date range (e.g. since:2010-01-31). Keep in mind, tweets are currently only cached for ~10 days.	since:
Until this date – Tweets tweeted on or before a certain day. The Boolean operator for this search is until: followed by a date in year-month-day format and can be used in conjunction with since: to create a date range (e.g. until:2010-01-31). Keep in mind, tweets are currently only cached for ~10 days.	until:

Figure 4: Date or date range search.

or during viral events when you need a broader view of what's being said about you or an event that matters to your organization. There are a couple of caveats to Twitter's user search. First, not all tweets

that reference your museum reference your museum's Twitter username. For example, if your username is @sciencemuseum and someone references you as Science Museum, @Science Museum (with a space), or #sciencemuseum, a user-specific search will not find the tweet. Second, users who have private Twitter accounts, even if they follow you and you can see their tweets in your Twitterstream, will not show up in a to:username or @username search, even if they reference your @username correctly.

Twitter is also searchable by location (Fig. 3). This is a sweet spot for Twitter because it accommodates searches for common phrases that would normally be too overwhelming to comb through.

The location search feature is not without its quirks. In late summer 2009, Twitter enabled an opt-in geo-location feature for tweets sent through third-party tools. This means that a user's exact location will be recorded in longitude/latitude coordinates as part of the tweet's metadata IF the user is tweeting through a third party application (as opposed to the Twitter.com web interface) that takes advantage of geo-location and he or she has agreed to publish his or her location to that application.

Otherwise, users' locations are determined by whatever they enter in the location field of their

profile, oftentimes set when their Twitter account was initially created. This is problematic because there is no standard way to provide location information. Someone located in Durham, NC, USA may state his or her location as Earth or US or NC or Bull City, North Cack – none of which would be found using Twitter’s location-based search within 15 miles of Durham.

Twitter also offers a date or date range search, (Fig. 4) but it’s the sort of thing that’s easily misunderstood. Tweets are by their very nature ephemeral and Twitter only currently indexes about ten days’ worth of tweets at any given time. During a viral event, where there are an overwhelming number of tweets in a short period of time, the ability to search a specified date range within the last ten days can prove useful.

Twitter is also searchable by attitude. Twitter provides two text-based indicators of attitude: the emoticons :) and :( to indicate positive and negative attitude. These emoticon searches also search emoticon synonyms, therefore a search for :) also searches :-)) and vice versa. Said entirely with punctuation and mathematical symbols because it’s fun to do... :) = :-)) & :(=-:(.

Artifact may be a better way to refer to this

Twitter artifact search	Boolean operator
With positive attitude – Tweets that contain the :) or :-) emoticon.	:)
With negative attitude – Tweets that contain the :( or :-( emoticon.	:(
Asking a question – Tweets that contain question marks.	?
Containing links – Tweets that reference a URL.	filter:links
Include retweets – Tweets that have been retweeted with Twitter's Retweet button. Tweets that have been retweeted with the phrase "Retweeting" or "RT" are not excluded by Twitter's search and therefore do not need to include this search filter in order to appear in search results.	include:retweets

Figure 5: Artifact search.

growing search capability (Fig. 5). For example, Twitter assumes that tweets that contain questions always include the presence of a question mark and that tweets suggesting a hyperlink always include the presence of `http://`. The beauty of searching the Twitterverse by artifact is that it encourages us to think creatively about the content of tweets and to realize that they can be more than the words they're composed of.

Turning the Twitterverse into a helpful dataset

At any given time the Twitterverse is roughly ten days old. This presents a real problem if you are

concerned with more than the real-time trends and pulses of Twitter.com – or if you aren't sure what your research focus may be in the future, but you realize the need to start collecting data now.

Consider it your personal responsibility to make a Makeshift Twitter Archive so that you have a dataset older than ten days to work with. Because the only methods available at the time of this writing rely heavily on the use of third-party tools, I feel it prudent to make the following disclaimer: if a third-party tool stops being updated, or the Twitter API changes in such a way that the tool no longer works, its function could come to an immediate and potentially permanent end. You should depend on the following recommended archiving methods with appropriate caution.

One way to create a Makeshift Twitter Archive is to send Twitter search results to Gmail. The basic premise of this approach is that you use a third-party notification tool (TweetBeep is a personal favorite) to send advanced search queries to an email address. For example, if you want to archive everything you ever tweet from:username – and everything that is ever tweeted to you – @username OR from:username – you can subscribe to those advanced search queries and anytime a matching tweet is found, you will be

emailed the tweet entire.

The reason this method specifies Gmail instead of email is because there are benefits to using a Gmail address for collection. First, Gmail's Google-based search engine is far more powerful than the standard email search tool. Second, Gmail filters will automatically label incoming messages so that they are easy to separate from other emails in your Gmail archive. Third, Gmail filters will automatically archive all incoming Twitter search results so that your archive can grow quietly without any maintenance or processing on your part.

The Twitter to Gmail method of a Makeshift Twitter Archive has its benefits and drawbacks. The main benefit is that even though it relies upon third-party tools, it is not married to just one – if a tool disappears, you can use another to send search results to your Gmail. The main drawback comes in format of your data. It's all contained in emails and requires fairly sophisticated Gmail search knowhow to traverse. There are no columns or rows or metadata to reference and there's a lot of boilerplate junk associated with most third-party tool HTML emails.

A second way to create a Makeshift Twitter Archive is to create a Tweet Scan Twitter Backup. This tool is accessed via the Tweet Scan website at

<https://www.tweetscan.com/data.php>. Tweet Scan requires that you grant special permission via your login at Twitter.com, thus making it only available to accounts that you have login credentials for. The tool will provide any combination of your last 1000 tweets, friends tweets, @replies, direct messages, followers' tweets, and tweets marked as favorites that you request going back to December 2007. The data is delivered to you in a locally hostable HTML file and a Comma Separated Values (CSV) file that can be opened in any spreadsheet application (e.g. Microsoft Excel, Google Docs, OpenOffice Calc or iLife Numbers).

The Tweet Scan Twitter Backup method of creating a Makeshift Twitter Archive is significantly more comprehensive than the Twitter to Gmail method. The data comes in a format that's easier to visualize, combine with other sources, and manipulate in whatever ways you may find useful. It's also searchable back to 2007, so even if you're only deciding to collect data now, you can access previous tweets and conversations that can no longer be found via Twitter's search. The drawback is that it's far more vulnerable than Twitter to Gmail because it's entirely reliant on one specific feature of one specific third-party tool, Tweet Scan.



Figure 6: Delicious bookmarks

A third way to create a Makeshift Twitter Archive is to use Delicious.com to inventory your findings. What's particularly helpful about this method is that it can be used in conjunction with any of the above methods if your organization has the time and resources to invest in it.

Basically, at the point and time when you identify a tweet as being about your organization or research interest, you record a bookmark of it in your Delicious.com account. This is most easily done in the Firefox web browser using the Firefox Add-on called *Delicious Bookmarks* located at <http://delicious.com/help/quicktour/firefox>. This Firefox add-on makes the act of adding a bookmark to your Delicious account a seamless, keystroke initiated, task that can be performed quickly and

without disrupting the browsing experience.

As you can see in Fig. 6, the entire text of the tweet, its permalink and a reference to its author is recorded in Delicious with institutionally meaningful metadata (e.g. member, grandmother, lemurs, visit). This enables you to find tweets by demographic, exhibit and/or context (e.g during a visit, planning a visit, remembering a visit) in the future. With just a few minutes a day you can amass hundreds of sortable, visualization-ready tweets in a relatively short amount of time.

There are three main benefits to using Delicious to inventory your findings. The first is that it turns social media listening into an actionable, referential piece of data instead of a momentary revelation difficult to act upon or reference in the future. Second, it creates institutional transparency if you advertise your collection of these tweets (and it doesn't have to stop with tweets – you can inventory blog posts, Flickr photos, or YouTube videos in the same way). Third, Delicious is remarkably extensible. You can easily combine any number of tags into an RSS feed that can then be consumed by any number of tools.

The major drawbacks to using Delicious are the time it takes, the relative difficulty involved in

retrofitting tags you think to add later or forget to add in the moment of bookmarking, and the fact that it's developed and maintained by a third-party.

Understanding your reputation and audience

Twitter turns our thoughts, conversations and gut reactions – once a private and closed economy – into open, mineable, collectable goods. Never have we been so intimately connected with our visitors – to know what they think of us alongside what they think of their family, their friends, their dinner. Never have we seen such scale and diversity in what is communicated about us, to us. Never have we been able to command the instant and direct attention of a visitor through an @reply or direct message to their mobile device. Most importantly, never has all this been available to us willingly and for free.

By making smart use of Twitter's Advanced Search Tool and by collecting those search results in a Makeshift Twitter Archive, we have the beginnings of a powerful new way to research. While there is no formulaic way to grep the nuance of community and discourse into a tidy understanding of our institutions and audiences, the following strategies will certainly help.

*Follow wisely:* Truly following your followed

creates a deeper understanding of your audience. You can choose to follow based on proximity to your institution, bio/tweet content, previous tweets about you... you can even follow-back everyone and then create a Twitter list (private or public) of users you really intend to follow. Whichever heuristic you use, make sure it enables you to consume content from a certain group of users. Depending on your resources and info processing savviness, the size of this group could be a handful of users or hundreds.

*Pay special attention to tweets that begin with @replies:* If you find tweets that begin with @replies in your Twitterstream that means that you follow people who follow each other. It often doesn't take more than a few minutes of browsing *in reply to* links to suss out a group of friends. Depending on the potential creepiness factor (Why is this institution following me when I don't follow them?), you may want to use private Twitter Lists for these groups in order to better understand their potential interests and opinions.

*People will act if you make something actionable:* If you query your Twitter followers with a request that is easy to answer (this does not mean the answer has to be easy), your chances of getting a response are much higher. Tweets that poll give your followers an

easy way to feel productive and they can also result in data for research-related questions that you have. Depending on the expectations of your followers and the viral nature of their responses, you could receive substantial data in return (be sure to capture it using a method referenced above so that it's not lost in the Twitter ether after ten days).

*Text is the new data.* Tools are cropping up every day that assist even amateur researchers in mining text for meaningful data and trends. Because several of the methods we have discussed in the chapter output RSS feeds (simplified, standardized XML data in text form), this is especially advantageous. Popular tools like Swivel – <http://www.swivel.com>, Wordle – <http://wordle.net>, and its parent IBM's Many Eyes – <http://manyeyes.alphaworks.ibm.com/manyeyes> offer an array of text visualization tools like word clouds, phrase nets and word trees. Increasingly, individuals are building data visualization tools with programming languages like Processing – <http://processing.org> and Protovis – <http://vis.stanford.edu/protovis>. These tools are harder to find, experimental, and sometimes temperamental, but nonetheless insightful.

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# **Clearing the Path for Sisyphus**

J E F F G A T E S

*Smithsonian American Art Museum*

*Washington, DC, USA*

Social media is changing the inner workings of our museums. Like many other organizations, our hierarchical structure has historically disseminated information from our experts to our visitors. The envisioned twenty-first century model, however, is more level. Instead of a one-way presentation, our online visitors are often interested in having a conversation with our curators and content providers. And many of us are joining our traditional experts in representing our institutions in these conversations. In response, we in new media have been looking for ways to engage our public by designing and using applications that encourage dialogue; however, in order to succeed all of us will need to approach our jobs and our relationships with our co-workers in different ways.

While the early hope of many technorati was that the web would dramatically change the inner workings of our cultural institutions, new media's role began as a support for more conventional projects – exhibitions, outreach, and our collections – with their web-based counterparts. But as new web 2.0 tools developed and we saw the possibilities for a greater engagement, we often felt like Sisyphus. We heard concerns that these new initiatives would take too much time, or they would take away from our

institution's core tasks. And just when we thought we had made inroads, the boulder would come crashing down: one step forward, two steps back. Our work was to function within our traditional organizational structure. Yet, these first steps were just a prelude to real change.

Social media is now challenging the traditional flow of information throughout our institutions and out into the world. Researchers, educators, new media specialists, and exhibition designers are asking to join marketing and public affairs departments in conveying the mission of our museums to our visitors. Blogs, Twitter, and Facebook, just to name a few social applications, allow for and encourage multiple institutional voices.

But how is this transformation really taking place? Are there methodologies that encourage this shift? And how can we negotiate with our peers a greater role in content creation and dialogue? How can we challenge existing paradigms, yet maintain the support of our coworkers?

Those of us at the Smithsonian American Art Museum<sup>1</sup> are working on two levels: as part of important Smithsonian-wide initiatives, like *Flickr Commons*,<sup>2</sup> and directly within our museum. In March 2009, I discussed social media's new roles for museum

professionals in an article titled *Confessions of a Long Tailed Visionary*.<sup>3</sup> Rather than just disseminating important cultural information to our visitors, we were adding new roles to our jobs as we began to engage our public in conversations about our museums and our artworks. We were exploring new connections, advocating for change, collaborating with each other to create new forms of dialogue, and organizing these new communities in ways that would benefit both our visitors and the museum.

In the months since penning that article I've been looking more closely at how we can more effectively embrace this change. And in doing so, I've started to explore how social media is changing not just our jobs but also our working relationships with our coworkers. Adding to the five new roles I outlined in 2009 are those of system analyst and negotiator. How can we work together to promote this change and increase our public network? And how do we negotiate with our colleagues as we parse out these new working relationships? What strategies work best for clearing that social media path for Sisyphus?

A case in point

One of our most successful pre-web 2.0 outreach programs has been our online *Ask Joan of Art* research

service.<sup>4</sup> For the past seventeen years people have been able to submit questions about American art to a research team at the Smithsonian American Art Museum and receive a detailed answer to their queries via private email. Over the years *Joan* has amassed a huge repository of useful information. But none of it has been available to the public. And when the New Media Initiatives department suggested we put this information online we were initially met with resistance.

Some thought we had more important short-term priorities. We had just completed a major revamping of our website's information architecture. Many projects had been put on hold while we completed this large task and our stakeholders were eager to get back to these. While New Media Initiatives saw many web 2.0 opportunities, we had to balance this with our more traditional service-oriented duties. So we had to be strategic when adding these to our normal workload.

In addition, *Joan* used a number of proprietary subscription-based publications, like Oxford Art Online, Art Full Text, and Art Index to answer these questions. All of these are full text citation indexes and the Smithsonian's General Consul office was concerned that making this comprehensive

information public might present a copyright infringement. A case could certainly be made for educational fair use. But our lawyers' concerns presented a roadblock we needed to deal with.

Simultaneous to this discussion, Kathleen Adrian, our real *Joan of Art*, began tweeting questions about American art, but only the questions.<sup>5</sup> Following her, I saw an opportunity and asked if she'd be willing to answer those questions on our website. By posting the question on Twitter and a link to the answer on a new page on our own site, we would not only bring these answers to the public but also bring followers back to us, creating a synergy between Twitter and our site. Adrian was willing but needed to structure the answers in a way that would not jeopardize the copyrighted material she mentioned in her private responses. So she started to post answers into an informative, yet less academic, form for our public site.<sup>6</sup> In addition, posting the question and answer on our own site in a comment format (using a third-party commenting application called Disqus<sup>7</sup>) allowed the public to interact with *Joan* should they have additional information to contribute or any follow-up questions.

In the six months since we started this project we have posted 21 *Ask Joan of Art* answers online

and over 700 people have come to this page to view them.<sup>8</sup> This is not a huge number in the scope of museum web statistics as a whole, but gratifying when you consider that only a few months ago this information was hidden from the public. Also, we are now building up quite a repository, so much so I started to become concerned that some of this would become buried once again at the bottom of the question and answer page. So I went to Adrian with another idea: let's repurpose these questions and answers as posts on *Eye Level*,<sup>9</sup> our museum's blog. The material was already written and would require only minor editing for style. Since we had already navigated the tricky copyright issue it would be easy to provide another outlet for information about the museum's artworks and bring this content back up to the surface to an expanded audience. And, by taking this path, we were able to do this quickly and with a minimal amount of decision-making by committee or higher-ups.

Working together we found a way to navigate around these initial barriers to bring this content to the surface. But it required looking at how we could structure the content and our systems to make it happen. *Joan's* answers were written in a form appropriate to each venue: detailed with citations

for private answers, more general for her public question and answer page, and more conversational for our blog posts. Adrian had opened the door when she began tweeting on her own. New Media Initiatives worked with her to develop information that benefited the reader and the museum without jeopardizing our other work.

Through our New Media Committee meetings, in which stakeholders from around the museum are represented, we developed an idea to bring *Joan* into the galleries. Using branded mobile boxes, where visitors could drop their questions about the art close by, could these answers also appear on *Joan of Art's* question and answer web page? We could focus on one or two artworks for a month and then move the boxes to other locations and other art. In addition to building a relationship between Twitter and our museum's website, we could complete the circle by encouraging it between our bricks and mortar museum and the web. We could not be stealthy about doing this part of the project and it is presently being considered by our administration. But our earlier work is laying the groundwork (and providing us with excellent talking points) as we make our case.

The methodology used to make these additions to *Ask Joan of Art* can be categorized, as a coworker

so aptly stated, as a *conspiracy to commit progress*. The New Media Initiatives department recognized the need to bring this content to the surface but we also took note of initial objections. Noticing the initiative of our stakeholder to experiment with social media, we saw an opportunity to move forward and encouraged a discussion on how we could use this to meet one of our most important web 2.0 goals: bringing buried content back to the surface. Working together, we then devised a strategy that resolved copyright concerns, was easy to implement (no added work), and value-added (created a connection between our social media efforts and our traditional museum website).

#### Adjusting our social media outreach: case study II

At present the American Art Museum has three Twitter and three Facebook feeds (each managed by a different department), one Flickr account (used by numerous departments but managed by New Media Initiatives), and our blog, which is also managed by New Media Initiatives. Last year all of us involved in the museum's social media efforts decided to form a working group to discuss and coordinate our various web 2.0 activities and plan for coverage of upcoming exhibitions and events.

The museum has been using Twitter since September 2008.<sup>10</sup> We tweet about upcoming public programs and point to our web-based content, including our blog and Facebook posts and to our Flickr stream. With a little over a year's experience and with different museum models now presenting interesting examples of how other institutions tweet, it seems like a good time to take stock of where we are and whether we want to move this outreach to another level.

There are a number of things we can explore. Do we want to increase the frequency of our tweets? Do we want to add multiple voices? In addition to the content we were already tweeting, is there anything new we could add to the mix? Specifically, is there any "low hanging fruit" we could pick to bring content back up to the surface to additional audiences?

We average about 1.8 tweets/day. By comparison, the Museum of Modern Art tweets 3.4 tweets/day and our sister Smithsonian institution, the National Museum of American History tweets 4.8 tweets per day.<sup>11</sup> Should we consider increasing our activity by using software like Hootsuite to allow us to bank tweets for publication later? Right now we are mainly tweeting directly into Twitter's web

interface, which has its limitations. Most of our tweets occur during weekday business hours. The Modern's is skewed a bit more into the evening hours while the American History Museum tweets much more frequently during the weekends. In addition, is there value in retweeting our own tweets multiple times? With the quick flow of Twitter people might not see our tweets the first time around and a second one, perhaps restated to look fresh, might be a good idea. Being able to create and publish our missives at a later time might be helpful.

In a recent *MuseumsEtc* webinar, *Twitter in Action*,<sup>12</sup> we learned that some museums used only one tweeter while others used multiple ones. Would it be advantageous to us and beneficial to our public if we had multiple tweeters, each talking about different aspects of the museum? A steadier stream of tweets might gain readership. But we did not want to add noise to everyone's feed. So if we were going to increase our stream we would need to find good content. But, once again, we faced the web 2.0 dilemma: too many good ideas and not enough time. Who was going to create this content? Did we have any quality low hanging fruit we could repurpose?



### 1001 Days and Nights of American Art

Could 1001 Days & Nights of American Art be our Twitter low hanging fruit?

In 2000 we created *1001 Days and Nights of American Art*, our first major online venture during the museum's renovation. We had planned on being closed for approximately 1001 days (truth be known it turned out to be over twice that amount). And we wanted to create a calendar of interesting facts about our collection during the period we were closed: one each day. It was another one of our pre-social media endeavors. While our building was closed we were open online and we wanted to remain connected to our visitors.

Designed and edited by hand each month, it was a huge effort that was supported by numerous departments in the museum and one that was begging to come back to the surface ten years after we first launched it. The question now is how to create a process that would allow us to do so with a minimal amount of work. Using our experience with *Ask Joan of Art*, perhaps a similar model could be used with 1001: tweet a teaser with a link to a new page on our website.

This is where we are right now. Our social media group is scheduled to meet in a couple of weeks and these ideas will be part of our discussions. Our Public Affairs department produces our tweets. How these ideas (or any new ideas) will fit into their present model and workflow and how receptive they will be to these suggestions will be part of our initial discussions and negotiations. Having a working group already established to discuss these issues is a good first step. Like *Joan of Art*, the content has already been vetted: a big time saver. Should we move forward we would do a system-analysis of the most efficient way to repurpose 1001 with an emphasis on minimizing the extra workload for everyone.

So what are we learning from these experiences? The social media aspects of *Ask Joan of Art* began

when a museum worker took the initiative to start tweeting on her own. Expanding its functionality by building a connection between Twitter and our museum's website first required us to see the bigger picture: matching the promise of social media with the specifics of our museum's programs and outreach. Under these circumstances it seemed natural for a few of us to conspire to commit progress. Extending our main museum tweets, however, will require discussion, negotiation, and collaboration. Interestingly, both of these methodologies are hardly revolutionary in organizations. They still require good face-to-face social skills. Yet, as we are becoming seasoned students of the shifts taking place in the 21<sup>st</sup> century museum, we can act as advocates and guides for the changes taking place in museum practice. By keeping in mind our core mission and connecting it to our social media practice we can make our case for a fuller online engagement with our audiences. It is important that our stakeholders know that we are not going to throw out what has worked just for the sake of social media and the next best thing. Coming across as reasonable with an eye to that next online development will encourage open discussions and negotiations, moving us forward.

There is no silver bullet to the success of these

new web 2.0 projects. Time, money, and personnel are still the anchors to success. And strategic fact gathering, good proposals, and excellent negotiation abilities are still critical in a social media worker's skill set. While new tools for connecting museum assets to our larger communities are announced almost daily, developing and integrating them into our workflow requires good traditional people-to-people management skills. But the desire to present our content and extend our connections with our online public in new ways has increased the need and urgency to fine-tune our ability to work well with our coworkers as the boundaries between museum departments and our job descriptions become porous and ever changing. Sisyphus still may be rolling that boulder up a hill, but it is getting smaller and easier to push forward.

## Notes

1. Smithsonian American Art Museum: <http://americanart.si.edu>
2. Smithsonian Photostream on Flickr Commons: <http://www.flickr.com/photos/smithsonian/>
3. Jeff Gates, *Confessions of a Long Tail Visionary*, *Life Outtacontext*, <http://outtacontext.com/life/archive/000525.shtml>
4. Ask Joan of Art, Smithsonian American Art Museum, <http://americanart.si.edu/research/tools/ask/>
5. Ask Joan of Art Twitter feed, <http://twitter.com/askjoanofart>
6. Ask Joan of Art, Smithsonian American Art Museum, [http://americanart.si.edu/research/tools/ask/question\\_answer.cfm](http://americanart.si.edu/research/tools/ask/question_answer.cfm)
7. Disqus: <http://disqus.com>
8. Our statistics show that people are staying longer than average on this page when compared to our Web site as a whole (3:03 minutes verses 2:40 minutes).
9. Eye Level: <http://eyelevel.si.edu>
10. Smithsonian American Art Museum Twitter feed, <http://twitter.com/americanart>
11. Twitter statistics via <http://tweetstats.com/>
12. Twitter in Action, Museums Etc, <http://www.museumsetc.com/products/real-world-twitter-in-action-cd>
13. This article first appeared as a paper for *Museums and the Web 2010*. Gates, J., *Clearing the Path for Sisyphus: How Social Media is Changing Our Jobs and Our Working Relationships*. In J. Trant and D. Bearman (eds). *Museums and the Web 2010: Proceedings*. Toronto: Archives & Museum Informatics. Published

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## ANALYSIS



Musée d'Orsay, Paris

# **The Art of Playful Mobility in Museums**

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Many of us interact with other people in online games and social networks, through multiple digital devices. But harnessing playful and mobile activities for museum learning is mostly undeveloped. In this chapter we explore play as a structure to support visitor learning, drawing from international research in museums and interaction design. We argue that play and mobility provide museums with ready-made structures and concepts which help them plan for visitor learning.

How museums can tap into mobility

The pace with which mobile technologies develop challenges many aspects of social and individual construction – the way people view themselves and others – in distinct ways. Technology can create new relationships with devices and services (Turkle, 1984; 1995; Ling and Donner, 2009); this can be seen in messaging systems, GPS, internet access, social networks and location-based services. The uses of mobile media also influence how people relate to each other, for example by creating feelings of co-presence (Katz & Aakhus, 2002; Katz, 2008) through easy accessibility, being able to reach and be reached, and participating in social networks despite being on the move. Location-based social networks

(such as Foursquare) can add to such feelings (Souza e Silva & Gordon, 2011) by allowing others to know where you are geographically and, when friends are nearby, enabling face-to-face encounters. This can also be a source of political engagement and entertainment as well as sociability – not to mention its playful character as we are entertained by our devices and applications in their functionality and behaviour.

These technologies now permeate all areas and institutions, and there are commonalities in how mobile users everywhere behave. Ito, et al (2007) identify three “genres of presence” in which people use mobile technologies to personalise public spaces: *cocooning*, or sheltering themselves from the surrounding and physical space (think of wearing headphones on a bus or train); *camping*, or creating personal work spaces (think of all those people sitting in cafes with laptops); and *footprinting*, or leaving traces in particular locations (think of “checking in” at a bar or restaurant using a location-based service). These three behaviours were found in London, Tokyo and Los Angeles – three geographic and culturally distant places – and it’s easy to see that all of these behaviours exist – and can be harnessed – in museums.

But alongside these commonalities, there are also important differences in the ways different cultures use mobile technologies. In a fascinating study, Lasén (2005) looked at how people use mobile phones in three cities geographically close together (London, Paris and Madrid) – particularly how people use their phones in social settings, whether stepping away from the group to take a call, ignoring the group you're with, or including everyone in the conversation. It is well-known that most people visit museums with others (Griffiths and King, 2008); understanding visitors from your own, as well as other, cultures can help you design an appropriate experience.

Mobile technologies are constantly changing, yet many of the issues museums face when undertaking a mobile project have, to some extent, already been addressed by other museums. Therefore, in order to avoid making the same mistakes over and over, it helps to understand some of the lessons already learned.

A foremost concern when thinking about mobile technologies is the issue of distraction: Will visitors pay more attention to the technology than the artworks or exhibits? The answer to this question lies in design. According to Gammon and

Burch, “when properly designed, digital technology actually increases visitors’ engagement with real objects” (Gammon and Burch, 2008:39). They discuss interactive labels in a science museum, which were “used as complementary interpretation rather than merely displacing attention away from the object,” in tests with more than 3,000 visitors in observations and interviews. In a history museum, mobile devices helped students to make connections between seemingly disparate objects and rooms (Walker, 2010). In both cases, the focus was on the design of activities, not the technologies themselves.

The Exploratorium, which has pioneered so many areas of visitor engagement and learning, has learned many lessons over the years from its experiments with mobile technologies. Hsi (2008) shares several: for example, that “content should be socially relevant, educational, and actively personal” (Hsi, 2008:129); that content should match “the physical context of use so it becomes seamless with the user experience”; that museums should make clear “when messages are private or public, where they are posted, and who reads them” (Ibid., 133); that letting visitors personalise their museum journey, for example with photos of themselves, is a powerful lure; and that museums should not automatically rush to the latest

technology, as it can create an “overhead” for the experience. Again, the focus is not on the technology itself, but on what you want visitors to do and learn, and therefore how to structure the experience.

Using mobility and playfulness in visitor learning  
Museums are places of free-choice learning, according to Falk and Dierking (2000), in which visitors’ choice and control is important. Considering that mobile devices naturally offer such aspects of private versus public, mobility allied to play can create an effective means of experiencing museum content and collections.

A good example of this was a set of trails at the Victoria and Albert Museum in London, created in collaboration with university tutors, museum educators and designers. The trails were implemented on handheld digital devices, but what made them particularly effective was that they encouraged students to engage in overtly playful activities. For example, students were prompted to laugh out loud in order to gauge other visitors’ reactions; to imagine conversations between the subjects of a painting; to secretly photograph other visitors’ ankles in front of a Tudor-era bed; to write messages to other visitors; and to set the device in front of a display of plates

while it played a video of someone breaking plates, in order to watch other visitors' reactions. Tutors and curators hadn't considered that students could visit the museum for purely social reasons, but these unconventional trails served to engage young people and help them feel at home in a space they otherwise perceived as stuffy. Furthermore, the trails had real learning benefits, by prompting the students to look at objects they might not otherwise have noticed, to look at objects in different ways, and to question assumptions about the museum as a social space and cultural authority. (See Walker, 2008)

Johan Huizinga, a Dutch historian who focused on play, pointed out that cultural manifestations such as religious rituals, like playgrounds, act as a kind of sanctuary, or "spatial separation from ordinary life" (Huizinga, 2002:19). Any parent knows that when children play, they use their imagination, making up micro-worlds which have their own laws and languages.

We believe that museums can be viewed similarly – indeed as social laboratories (e.g. Fritsch, 2007). While digital technologies make possible virtual reality, museums and zoos are already artificial constructions (Robinson 1998:46). Museums generally collect and display objects from other times, places and contexts,

yet they themselves are as distinct from the objects' original contexts as they are from "real life" outside their walls. Pierroux, et al (2007) therefore believe that the key to visitor meaning-making is to help bridge the original contexts of museum objects with visitors' everyday lived contexts, and the authors propose that portable digital devices in particular can be an effective means of building such bridges.

The Experimentarium, an institution in Copenhagen which focuses on promoting the natural sciences and technology, did something similar when it used young people's own mobile phones to structure a visit by means of a meta-narrative to bridge the visitors' use of the exhibits – and by extension, to help them learn scientific concepts. The meta-narrative took the form of a woman's voice which purported to guide the visitor around the exhibition. But the visitor became unwittingly enmeshed in an interactive narrative which changed according to individual interactions with the exhibits and with the narrator. At each exhibit, the visitor formed hypotheses about his or her own abilities and characteristics, while the system compiled a personal profile of the visitor in order to match them with another visitor with a similar profile, and the two visitors were prompted to collaborate.

Suddenly however, a hacker interrupted and would begin to criticise the narrator, questioning her identity and suggesting she had a hidden agenda. “If the visitors trust the hacker,” Kahr-Højland (2007) explains, “he will show them a piece of evidence showing that the woman who has been guiding them is testing them for a cunning and evil purpose.” The visitors ended up in a secret room where they found an animated rat. Its voice was familiar; the woman who guided the visitors was actually a mutated rat who had taken control of a science lab, and she had made the visitors, in turn, into laboratory animals. “The story ends,” Kahr-Højland writes, “by the rat challenging the visitors to fight for their freedom by means of a computer game (which they are predetermined to win). Game over.” This game-within-a-game-within-a-game structure harnessed a tool most visitors already carry – the mobile phone – to create an artificial narrative world within the already artificial world of the museum. But the results – knowledge about scientific concepts – were real.

Museum visitors do not usually have a predetermined idea of what they are going to do or learn in an exhibition, unless they are very familiar with the subject matter; thus they willingly allow the museum to structure their visit to a certain

extent, according to Smith and Tinio (2008). A key for museums in structuring play-based activities is recognising visitors' goals and motivations for visiting – for both leisure and learning, and for social as well as cognitive and aesthetic experiences – and balancing these with curatorial goals and learning outcomes. Museums provide a bounded space for play, and games provide a rule-based structure. Play depends on order and preset rules, as a way of setting boundaries to the free will inherent in unstructured play. In other words, this is when play becomes a game. Few people associate the words *rules* or *order* with play, but in fact this relation is so embedded in play as to be all but invisible. Understanding the co-dependent relationship of free choice and rules is the ground for building any successful playful experience.

#### Social play in museums

Mobile devices promote feelings of co-presence (Katz & Aakhus, 2002; Katz, 2008), expanding even further the concept of co-experience which is intrinsic to play, in which members of a game unite towards a common goal, as part of a team. According to Huizinga, “a play community generally tends to become permanent even after the game is over” (Huizinga, 2002:12). He

points out the value of play as an aggregation tool, bringing people together to share an activity “of mutually withdrawing from the rest of the world” (Ibid.), and its value in creating alliances which go beyond the time of play. In other words, a distinct – and fun – experience tends to be remembered by the people involved in it, and becomes a source of linkage among the group.

Linking people who share a common interest is a successful activity online, but could the same be done within the museum walls? Museum visitors do not necessarily share a sense of community, but by choosing to visit particular exhibitions, they do share common interests. As discussed, visitors go to museums for a social as well as educational experience (Hood 1983:50); spending time with friends or family is one of the main motivations for visiting (MacDonald, 2002; Pekarik, Doering and Karns, 1999). And interfering with social interaction, for example in the way that exhibits are designed, has been shown to impact both learning and enjoyment (Allen and Gutwill, 2004). Museums have not only a social but a socialising function, as a place where people “learn the skills of public interaction” (Bradburne, 2001), acting as a “space of emulation” (Bennett, 1995:98).

The Interactive Museum of Economy in Mexico City (Museu Interactivo de Economía, MIDE) provides a good example. In a market game, participants receive a device which allows them to exchange particular goods with others, but must follow the demands of the market with bids and prices, supported by live market data, which is of course shaped in turn by players' activity. This 20-minute game helps visitors understand market values and structures in a fun and simple way, and was designed to help players easily remember intangible market concepts through a tangible, sensorial and social learning experience. Furthermore, it promotes communication and collaboration among people who would not necessarily have engaged socially otherwise.

Public and private spaces have now blurred as mobile technologies bring our personal and social experiences with us wherever we go. Sharing things daily is part of the success of social networks like Facebook and Twitter. Whenever we do or see something interesting, sharing it is now part of the activity, and this has contributed to a sense of community and of fulfilment in social networks; they work by bringing people together in spite of location or time. And conversely, with always-on

wireless broadband and portable devices, we expect information and interactions any time, any place. This activity can, in turn, become a memory which is kept and remembered on a mobile device – which can serve as a portal back into the museum playground.

True engagement can be fostered by allowing people to co-produce experiences (Pine & Gilmore, 1999). In museums visitors are not usually invited to express their views or knowledge, and offered few possibilities to co-create. But such opportunities, even when done digitally, could allow alternative interactions with gallery spaces, especially considering how technologies can introduce alternate realities, as in the Experimentarium example earlier.

### Conclusion

We have proposed that museums harness relevant aspects of play – its free-choice nature, its separation from reality, its inherent rule-based structure, and its ability to bridge communities – which we have shown to fit with the existing nature of museums. Many museum researchers (e.g. Putnam, 2009; Parry, 2007; Hooper-Greenhill, 1999) consider the museum as a medium, following McLuhan (1964) who stated that media send their own messages which are distinct from the “content” they carry. And museums are

themselves full of other media, including digital media – which, by definition, mediate visitor meaning-making, according to Thomas (1998:viii). Similarly, visitors expect to have access to the latest technologies in museums, and according to Borysewicz (1998:107), museums have been among the most experimental groups in working with media.

Mobile devices connect our personal and social lives, through distinctive ways of interacting with and through the device, whether with the world we're in currently or one far away, whether real or fictional.

Museums, can therefore provide an additional layer of personal and social learning, by capitalising on the portal to personal and memorable experiences sitting in everyone's pocket, augmenting the ways they are perceived, and providing ongoing interactions with museum visitors after they have left the building.

The examples presented here also exemplify another relevant point with regard to mobile technologies as a means of enhancing learning, motivation or engagement – the need for close collaboration with curators in order to fulfil the learning goals of the experience. In other words, mobile and playful applications in museums should be planned together and parallel with the whole of an

exhibition. This means curating an experience, not just an exhibition, and not just adding technology as an extra layer or afterthought, but designing it as an intrinsic part of the whole process.

The very term *visitor* implies passivity – someone who visits the museum then goes away. By contrast, a *player* is inherently active, and play enables museums to bridge their leisure and learning functions, to become knowledge playgrounds.

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**EGO-TRAP**  
**The Design and Implementation**  
**of a Digital Narrative**

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Digital narrative, augmented reality, mobile gameplay and serious gaming: the innovative exhibition concept titled *EGO-TRAP – you have no idea* goes by many names. In 2007, *EGO-TRAP* was launched as a cellphone-facilitated narrative pathway in the exhibition hall of a Danish science center,<sup>1</sup> marking the temporary high point of two years' design-based research.

This chapter opens with a description of *EGO-TRAP* as an educational design, then later presents some of the theoretical ideas lying behind the innovative exhibition concept, and concludes with some of the insights gained from the empirical studies in *EGO-TRAP*. In introduction, *EGO-TRAP* was designed with the aim of supporting pleasurable engagement as well as critical reflection in the exhibition. The latter was supposed to be triggered by pushing the boundaries of the conception of authority. As will be evident, this did not turn out exactly as expected.

*EGO-TRAP*: a digital pathway with two narrative layers  
*EGO-TRAP* is probably best described as an individually adapted narrative pathway facilitated by visitors' personal cellphones. It works by means of WAP/GPRS technology and is characterized by three progressive levels and two narrative layers, referred to as the

personal test and the meta-narrative, respectively.

Ben, a high school student from Denmark, describes his experience in *EGO-TRAP* as: *EGO-TRAP (...) to me it was almost like a journey, a trip (...) an ego-centric trip in a way, where you really got to know yourself (...) You think it is a trip, and then it turns out to be a trap.* (Interview with Ben, Kahr-Højland 2010b, p. 9, translated from Danish)

Ben's feeling of "being trapped" hints that the experience in *EGO-TRAP* is pushing the boundaries of the conception of the museum as a genre as well as an authority. The following section describes the experience of *EGO-TRAP*.

*First level: A personal test – and getting familiar with the procedure:* On arrival the visitor signs up for *EGO-TRAP* in the entrance hall. The visit in the exhibition is initiated by a phone call, which the visitor will receive on his/her cellphone. A woman (e.g., the voice of a prerecorded actress which is distributed from a central server) will introduce herself and ask the visitor to play a simple computer game in which the visitor is to prevent a rat's escape from a maze. "The woman" will phone the visitor and explain that they are part of a personal test, in which she will guide the visitors from one hands-on exhibit<sup>2</sup> to another in the exhibition hall at the Experimentarium. "You



say that human beings are smarter than animals,” she states, “We would like to test that! First of all, I would like to find out how fast you are able to move in a wheelchair. Please go to the two wheelchairs in the exhibition hall.”<sup>3</sup>

The woman guides the visitors to different exhibits in the exhibition hall by means of phone calls and maps, which are shown on the display of the visitors’ phones. The maps display their current position and the next location. The participants are sent to different exhibits in order to create individual pathways and avoid queuing up in the exhibition hall. Each exhibit represents a post in the personal test; before interacting with the exhibit, visitors are asked



to make a prediction of their own results by typing it on the keypad of their phones. *Wheelchair Energy* represents one example of an interactive exhibit in *EGO-TRAP*. At this exhibit you are supposed to move in the wheelchair as fast as possible. While you move the wheelchair, lemonade drips into a glass. The lemonade corresponds to the energy the visitor uses while moving the chair. When the visitors finish, they can regain the energy lost by drinking the lemonade.

After each exhibit in *EGO-TRAP*, the instructional voice will phone visitors and evaluate their performances. The voice might say: “You tend to



underestimate your own physical strength. Let's see what it's like when it comes to recognizing colors..."

The personal test represents the primary narrative layer in *EGO-TRAP*. After four exhibits the visitors will receive a personal profile constructed from their performances in level 1.

Based on this profile, the instructional voice will match the visitor with another person in *EGO-TRAP*. If the visitors agree to be matched with a partner, they will move on to the next level of *EGO-TRAP*, which is the level of cooperation.

*The second level: about cooperation – and a growing suspicion that the test is not what it seems to be:* In level 2 the visitors are still navigating within the framework



of the personal test. Just as in level 1, the visitors are guided to different exhibits, they type their predictions, and the instructional voice subsequently assesses their performances. But unlike level 1, the scope of the personal test in level 2 is to uncover the visitor's ability to cooperate with his or her matched partner. In level 2 the visitors, among other things, are asked to whisper secret messages to each other using two satellite dishes and cooperate to score points in a



game called Play with the powers of the air.<sup>4</sup>

Level 2 is also the level that arouses suspicion, as the visitors will realize that their experience in *EGO-TRAP* is not the personal test it seems to be. At a certain point the participants receive a phone call from another instructional voice, this time that of a man, who explains that he has hacked into the system. “The hacker” throws suspicion on the woman, the original instructional voice: “Why is she asking you all these questions? I think she may be playing games with you,” he states. He urges the visitors to cooperate with him in bringing the woman’s true agenda to light. The hacker’s entrance on the scene indicates the presence of another narrative layer in *EGO-TRAP*: namely, the narrative layer referred to as the meta-narrative.

*Third level: Confrontation – and the disclosure of who’s really behind the test:* The visitors have to decide whether they trust the hacker or the original instructive voice. If they believe the woman, she will be very eager to make them finish the game and leave *EGO-TRAP*. If they believe the man, he will guide them to what he assumes is the woman’s secret room. The room is situated underneath the central staircase in the entrance hall of the Experimentarium, right next to the desk where the visitors signed up for *EGO-TRAP* and played the *Ratrace* game. The room appears to be locked by a secret code, but the hacker breaks the code and allows the visitors to enter. When the visitors enter the small dark room, the door slams behind them, and they are confronted with an animated rat, which speaks with the voice of the woman. It turns out that the woman is in fact a rat who has mutated. She and her fellow animals have taken control of the science lab and are now investigating humans. As a matter of fact, the roles have been switched: the participants have been in the roles of testing animals for the past 1.5 hours in *EGO-TRAP*. The rat is angry that the visitors found her secret place and she declares that they will be trapped in her cage unless they are able to conquer her in *Ratrace* – a 3D version of the computer game that they played initially in *EGO-TRAP*. Now the visitors are in the

role of the rat trying to escape the maze, while the rat/woman is the one closing the doors. When the visitors conquer the rat (at some point they will, as the game was created so that the visitors are predetermined to win), the door will open and they are free to go. This is where the experience in *EGO-TRAP* ends.

The technique behind *EGO-TRAP*

The technological development of *EGO-TRAP* has been carried out in cooperation with a Danish firm, Unwire. The visitors' phones must be able to run WAP/GPRS, which is a free service; however, you pay for the amount of information you download. The experience in *EGO-TRAP* lasts for about 1.5 hours and during that period of time you download information to a total cost of approximately 1 USD.

The communication in *EGO-TRAP* runs in a WAP/GPRS session and is characterized by being a two-way dialogue. A central server distributes the phone calls from the woman and the hacker, as well as the guiding maps on the display; the visitor responds to the system by means of the keypad on the phone. During the *EGO-TRAP* experience, the participants are still able to receive phone calls from other people. They can take a break, visit other parts of the exhibition for as long as they want, and still return to the place

where they stopped in *EGO-TRAP*.

*Design Based Research as a methodological approach:* Developed as part of a Danish research program, DREAM (Danish Research Center on Education and Advanced Media Materials), *EGO-TRAP* was designed as an innovative learning resource, using Design Based Research (DBR) as the overall methodological framework (Baumgartner, et al, 2003; Barab & Squire, 2004). The basic idea of DBR is to bridge the gap between educational theory and practice. Working within the framework of DBR implies that you as a researcher make changes – for example, implementing new educational designs in an existing learning context (in this case the Experimentarium). The educational design is planned on the basis of theoretical arguments developed by the researcher, whereas the development and implementation of the design is carried out in close collaboration with practitioners in the learning context. The design process of *EGO-TRAP* was carried out as an iterative design process counting a total of four iterations. For further details on the methods and design process see Kahr-Højland, 2010b, or contact the author).

Why was *EGO-TRAP* made?

*EGO-TRAP* was originally planned as a learning remedy

at a science center, with students aged 14-17 from high schools as the primary target group. *EGO-TRAP* was developed with the aim of supporting pleasurable engagement and critical reflection. As argued for by Kahr-Højland, 2010b, pleasurable engagement and critical reflection are to be considered important constituents of a modern conception of scientific literacy (Kahr-Højland, 2010b).

*The classical science center and the need of scaffolding:* The design process of *EGO-TRAP* started with the pinpointing of a problem: the lack of structure in the exhibition hall at the Experimentarium. The Experimentarium is considered a “classical science center” i.e., a science center that builds on the tradition of Frank Oppenheimer (Oppenheimer, 1968). In his *Rationale for a Science Museum*, Oppenheimer claimed that visitors at science centers were to walk into a “forest of phenomena” (that is, hands-on exhibits) where they should be free to interact with exactly the kind of phenomena that caught their interest. Oppenheimer’s rationale foreshadowed the opening of The Exploratorium in San Francisco (1969). Since then, thousands of science centers influenced by the ideas of Oppenheimer have seen the light all over the world. To visitors, the “classical science center” exhibitions appear as an explorative

milieu with no tangible structure (Bradburne, 2001; Kahr-Højland, 2010b); these kinds of exhibitions have proven to cause a lot of “random button pressing.” The average time spent on hands-on exhibits at science centers have been measured as less than 30 seconds (Walker, 2008, Paris, 1997). The design process of *EGO-TRAP* therefore started with the assumption that if classical science centers like the Experimentarium have a learning goal which is higher than that of an amusement park, there is a need for scaffolding<sup>5</sup> – i.e., a need to offer directional guidance – to a higher extent than in the Oppenheimer tradition (Kahr-Højland, 2010b, Kahr-Højland, 2010a). The *EGO-TRAP* educational design experiment was based on the idea that scaffolding the visitor, by adding a digital narrative pathway to the existing exhibition, might solve the problem of random button pressing.

*The narrative as the primary remedy of scaffolding:* The narrative was chosen as the overall means of scaffolding in the educational design. The choice of the narrative as a scaffolding remedy at the Experimentarium was primarily grounded in results from cognitive science (represented by, among others, Jean Mandler, 1984, and Jerome Bruner, 1986; 1990) and sociolinguistics (represented by William Labov, 1972). The insights gained from these theoretical fields point

to the fact that narrative possesses some intrinsic qualities due to the structure. Results from cognitive science have thus shown that narrative and human comprehension are indeed closely related. We use narrative structure in order to understand ourselves and our surroundings (Mandler, 1984; Bruner, 1986; 1990). In his sociolinguistic investigations, Labov has pointed to the fact that the narrative has an integrated dimension of evaluation. Labov characterizes the element of evaluation as “perhaps the most important element in addition to the basic narrative clause” (Labov, 1972, p. 359). Due to this built-in element of evaluation, the narrative establishes a distance between the audience and the narrative. And by that, Labov argues, the narrative in itself calls attention to the fact that it is indeed a narrative – which again supports meta-reflective processes within the audience (Labov, 1972).

*The intrinsic qualities of the narrative:* Mandler (1984), Bruner (1986; 1990) and Labov (1972) show some of the intrinsic qualities of the narrative:

- The narrative organizes information in a meaningful way as it provides a recognizable context and by that, supports human comprehension. (Mandler, 1984, Bruner, 1990)
- The narrative represents a well-known

framework which is decoded easily by a broad target group. (Mandler, 1984; Bruner, 1990)

- The narrative holds the possibility of containing several systems of meaning, running in parallel: this means that the narrative can function on an elementary level of action as well as on an additional level of affection (designated by Bruner as the landscape of action and the landscape of consciousness, respectively). This makes it possible to engage people on several levels (cognitively and affectively) and makes it possible to challenge a broadly defined target group. (Bruner, 1986)
- The narrative scaffolds reflection by encouraging different interpretations rather than calling for clear-cut answers. (Bruner, 1990)
- The narrative calls attention to itself as being a narrative, and by that it scaffolds meta-reflection. (Labov, 1972)

*The potential of the narrative:* The intrinsic qualities are all ascribed to the structure of the narrative. Additionally, as argued for in Kahr-Højland (2010b), the narrative possesses a potential for supporting

both what Mihaly Csikszentmihalyi calls flow experiences (Csikszentmihalyi, 1990) as well as social learning processes (Wenger, 2003).

*Flow*: Flow may be best described as the positive feelings our body gives us in reward when we learn something new. According to Csikszentmihalyi and Hermanson, flow is:

*A state of mind that is spontaneous, almost automatic, like the flow of a strong current (...). When goals are clear, feedback is unambiguous, challenges and skills are well matched, then all of one's mind and body becomes completely involved in the activity (Csikszentmihalyi and Hermanson, 1995, p. 70)*

The achievement of (ideal) flow is about adequate challenge. Because visitors have individual capabilities, flow is all about framing experiences that are flexible and user sensitive. In that way it is possible to adequately challenge a broad target group and thereby make them engage pleasurably in the exhibition.

By experimenting with the balance between the known and unknown, the narrative may support flow experiences; due to its well-known form (“Once upon a time ...”), the narrative invites a broad target group and subsequently challenges the audience, either

through the development of an unknown content or by means of alternative narrative structures. Thus, the narrative is characterized by representing something well known and yet something unknown (we don't know the story before the narrative has been carried out).

*Social learning processes:* By creating a suitable balance between the known and unknown, the narrative possesses a potential for scaffolding flow experiences. Also, the narrative has potential for supporting social learning processes by providing a framework that calls for social participation. Etienne Wenger has shown how knowledge is produced from a constantly ongoing negotiation – verbally and non-verbally – between individuals and their surroundings. The negotiation of meaning takes place in different kinds of communities of practice (Wenger, 2003).

The narrative possesses the potential for supporting social learning processes by imitating communities of practices (Kahr-Højland, 2010b). To realize this potential, a special kind of narrative is required. The narrative in *EGO-TRAP* was thus planned with the aim of using the intrinsic qualities of the narrative, as well as realizing the potential of the narrative by imitating the establishment of

communities of practice (Kahr-Højland, 2010b).

*The presence of the narrative in EGO-TRAP:* Jerome Bruner has established the following minimum demands of what constitutes a narrative: a narrative is characterized by having an actor who acts in order to reach a goal in a recognizable environment. The actor uses different kinds of means in order to obtain his goal. Often there will be a problem, which propels the action from an initial position to a final position (Bruner, 1996, p. 161).

With this definition of a narrative in mind, *EGO-TRAP* is characterized by two narrative layers, referred to as the personal test and the meta-narrative.

*The personal test:* In the personal test the visitor takes up the role of the actor, who acts in order to reach a goal. Framed by the apparent narrative framework of a test, the goal is to gain insight into your own abilities (manifested in a personal profile). The exhibition constitutes the environment, while the exhibits and the woman (original instructive voice) represent the tools used by the actor in order to reach the goal. The initial position is represented by the participant's insufficient knowledge about himself, while the final position appears when the participant receives his personal profile.

The purpose of the test narrative was to create

a narrative framework that would invite the young target group to engage pleasurably by offering them a role as a subject, with which they could easily identify. This was based on previous studies of the young target group as well as focus group interviews carried out initially in the design process (Buckingham & Scanlon, 2003, Quistgaard, 2006, Kahr-Højland, 2010b). Also, the idea was to create a narrative framework that emerged naturally from the already existing exhibition at the Experimentarium. The test narrative made it possible to involve predictions and evaluations as a natural part of the design, which again made it possible to carry out the narrative's potential for supporting flow experiences.

*The meta-narrative:* In the meta-narrative the visitor is still the actor, but the goal has changed: now it is all about gaining insight into the underlying objectives of the setup (the disclosure of the woman/rat). The means to gain insight are represented by the partner, the hacker, and the cellphone (which can be used to phone others, asking for advice). In the initial position, the visitor is unaware that the woman is a rat, while in the final position, the visitor is confronted with the woman/rat in the rat's room.

Ideally, the meta-narrative was thought to establish a narrative layer about conspiracy theory,

which would prompt the visitors to take a step backward and reflect critically on the setup of *EGO-TRAP*. The hacker's entry on the scene marks an unexpected turn in *EGO-TRAP*. By experimenting with the content and form of the narrative, the idea was one of challenging the visitors in order to carry out the narrative's potential for supporting flow experiences. Similarly, working with a partner as a team in *EGO-TRAP* was an attempt to carry out the narrative's potential for supporting social learning processes. The cooperation in *EGO-TRAP* happens within the framework of the personal test. However, at the same time, the partnership was thought to simulate a community of practice. The ideal goal in this case was to urge the students to discuss a shared repertoire of exhibits and, in that way, encourage critical reflection in relation to the experience within the exhibition.

The meta-narrative was thought to engage the students and to support critical reflection by challenging the concept of the museum as an authority. Ideally, *EGO-TRAP* was thought to support reflection on the foundation for knowledge. The revelation that the woman is a rat represents an element of surprise, which was thought to challenge the idea of the museum as an authority. The idea

was to call attention to the fact that information is not considered an absolute truth just because it's presented by a science center or a museum. Thus the intention for the metaphor of conspiracy theory in *EGO-TRAP* was to identify the fact that there is always someone behind the information you receive; the sender, who presents the information, has always inevitably interpreted the information we receive. By pointing out the fact that the sender is not whom she pretends to be, the meta-narrative in *EGO-TRAP* was thought to challenge young people's basic ideals of knowledge.

#### Empirical studies

Following the guidelines of Design Based Research, *EGO-TRAP* was implemented in the exhibition hall at the Experimentarium through a design process with a total of four iterations (Kahr-Højland, 2010b). The adjustments of the educational design were based on empirical studies of young people interacting in the exhibition. The empirical data collections and the subsequent data analyses were planned as a qualitative study (Flick, 2006; Kvale, 1997). The empirical studies in *EGO-TRAP* were designed so as to gain insight into young people's experiences and reflections related to their interactions with the

exhibits at the science center

In total, more than 300 students tested *EGO-TRAP*. These students came from both primary and secondary schools. The students tested *EGO-TRAP* in different stages of the iterative design process as every test round resulted in adjustments in the educational design (Kahr-Højland, 2010b). Many of the students (about 200) were observed in the exhibition in order to make adjustments to the educational design. Some of these (about 50) participated in focus group interviews at the Experimentarium immediately after their visit to *EGO-TRAP*.

The primary group of subjects consisted of three high school classes, selected from different areas of Denmark. From each class two subjects, one male and one female, were selected for video recordings and subsequent semi-structured interviews, each lasting for about one hour. These six were the key informants of the study. The selection of the key subjects were based on the criteria that they should be average science students and that they would not be too disturbed or anxious by the fact that they were supposed to be video recorded. The interviews were carried out one to two weeks after their visit to *EGO-TRAP*. The interviews were planned as semi-structured interviews, in line with the suggestions

by Steinar Kvale (Kvale, 1997).

The data analyses were based on transcripts of approximately ten hours' video recordings and eight hours' interviews with the key informants. The video transcripts were completed with the aim of covering as many semiotic levels as possible, in order to prepare an analysis that was as open and explorative as possible. The transcriptions describe among other things, the subjects' mimics and gestures; their movements in relation to each other, the exhibits, and the cellphones; as well as their dialogue during the experience in *EGO-TRAP*. Based on the theoretical framework of the project, the analysis was carried out with special regard to investigate how the narrative layers work in relation to the engagement of individual students and the possibility of achieving flow – as well as their development of critical reflection by means of social learning processes. Following the suggestions of Brigitte Jordan and Austin Henderson, the data was coded following both a vertical and a horizontal structure (Jordan & Henderson, 1995).

Insights gained from the empirical studies

Seen from the narrow perspective of an exhibition designer, the design of *EGO-TRAP* may be described

as a success. The young visitors are happily engaged users who navigate comfortably and securely in the exhibition with their cellphones. *EGO-TRAP* scaffolds young people in the exhibition so as to avoid the random button pressing that often characterizes a visit to a science center. Insights from the data analyses also indicate that the personal test supports experiences of flow. The young people's engagement is primarily linked to the narrative layer that concerns the personal test.

*The personal test frames the exhibits in a meaningful way:* A narrative framework inevitably offers a certain role or subject position for the person who interacts with it (Goffman, 1959; Bruner, 1996; Gergen, 2002). The video recordings of one of the key subjects in *EGO-TRAP*, Ben, suggest that the position offered by the narrative framework of the personal test is one that Ben can easily relate to. As an example, when Ben arrives at *Wheelchair Energy* a group of small girls, aged about seven, are playing at the wheelchairs. The video recordings show how the 17-year-old Ben sits down alongside the small children. In order to achieve a good result at the exhibit, Ben gives everything he has: he wheels the chair until he reaches the pain threshold in his arms, showing signs of pain when he finally reaches the goal. Seen from the outside,

the situation with Ben – a tough high school guy – resembles the situation of a young man sitting down in the sandpit surrounded by toddlers. But apparently, Ben does not experience the situation in this way. He is deeply engaged in fulfilling his role in the personal test. Ben himself describes the sequence at the wheelchairs very emotionally: “at that time it was like it (the exhibit) just wanted to make me bite the dust” (Kahr-Højland, 2010b, p. 71). Ben identifies with the role of a test person in a way that makes it meaningful and relevant to him, even in an exhibit that is practically inundated with toddlers.

*The personal test supports flow by balancing known and unknown:* The participants’ behavior and descriptions of the EGO-TRAP experience indicate that the guidance by the original instructive voice provides clear goals and unambiguous feedback by means of a well-known structure (prediction – performance – evaluation). At the same time, the personal test is characterized by having unknown content. The young people have a serious approach to the exhibits, which they often describe as providers of (unknown) information about themselves. As one of the informants, Anna, puts it:

*Entering your result and getting feedback was really funny, I also found it very funny that you did not*

*know what was next to come, I mean, as compared to receiving working sheets which tell you to do like this and then to do that (...) in a sense, you were totally unprepared of what was next to come, what you should test and what you were supposed to answer, and that, I think, was very amusing. (Interview with Anna, Kahr-Højland, 2010b, p. 70 translated from the Danish)*

*Social learning processes:* The data collections also indicate that *EGO-TRAP* realizes the potential of the narrative when it comes to supporting social learning processes. As will be evident in the following paragraph, this does not happen – as was expected – with verbal negotiations of meaning. Instead, the personal test tends to scaffold non-verbal negotiations, as the young people negotiate identity through their performances in *EGO-TRAP*. The young people’s negotiations of identity through the personal test indicate that individual and social learning processes are in fact two sides of the same coin.

*The engagement in the personal test happens at the expense of the meta-narrative:* The young people’s strong commitment to the personal test happens at the expense of their engagement in the meta-narrative, which was planned to support critical

thinking through social learning processes. The video recordings of Ben and his partner, Mille, at the exhibit *Reaction and Overview* serve as an example that the students do not demonstrate the same level of commitment to the meta-narrative as to the personal test. *Reaction and Overview* consists of a wall on which flashing lights appear in random order. Each time you press a button with a flashing light it will be switched off and a new light will begin to flash. The task consists of pushing as many flashing buttons as possible within 60 seconds. This exhibit appears in the second level of *EGO-TRAP*. When arriving at *Reaction and Overview*, Ben and Mille have been through different kinds of tests while, concurrently, the meta-narrative has developed and is now about to reach its climax. The hacker keeps calling with circumstantial evidence that the woman has a hidden agenda. He urges them to phone other visitors in *EGO-TRAP* in order to figure out the truth about the woman. But Ben and Mille are much more occupied with getting a good result in the test. They are performing to each other as well as to their surrounding classmates, and the only evidence we get that the hacker is calling them and urging them to contact other classmates, is Ben's comment: "I haven't (...) it came up with all these phone numbers, I haven't phoned anybody." No

one answers him and they never discuss it again. As it seems, Ben and Mille continue in their roles as test persons, which they have adopted since they were first introduced to the personal test. At this point, despite the theme of conspiracy introduced by the hacker, they are still in their roles as test participants, occupied with their progress in the test.

*Performing a third narrative layer:* The young people do engage in the meta-narrative in the sense that they express having fun and physically act on what Bruner refers to as the landscape of action of the meta-narrative (c.f. the intrinsic qualities of the narrative p. 142); they actually run to the rat's room at the end of the sequence. But their engagement in the meta-narrative never reaches the high level of engagement, evident in the part of the experience related to the personal test. When Ben and Mille perform at *Reaction and Overview*, they do it within the framework of the personal test. Apparently, they feel comfortable with the subject positions offered by the narrative framework of the test and as a consequence, they do not negotiate meaning through critical dialogue about the hacker and the woman. Over ten hours of video and mp3 recordings from the students' interactions in *EGO-TRAP* reveal the fact that in *EGO-TRAP*, verbal communication is reduced to a minimum. This means that the critical

discourse and negotiation of meaning that was thought to be prompted by the meta-narrative does not emerge. This does not mean that the social learning processes are absent in *EGO-TRAP*; it rather means that the social learning processes are happening in unexpected ways.

The situation at *Reaction and Overview* is one of many situations in *EGO-TRAP* indicating that the students are in fact performing to each other in *EGO-TRAP* (Kahr-Højland, 2010b). When Ben performs his best, it is not just to get a good result at the exhibit. The subsequent interview with Ben reveals that he is very much aware of the fact that the classmates are watching him, judging his performance. Thus the result at a given exhibit is not just a personal matter: every single result represents a piece in the jigsaw puzzle constituting the identity of the student (*Am I strong? Do I have musical abilities? Am I good at estimating my own abilities?*). Every single piece of identity is obvious, available to everybody, and is immediately thrown out in a larger jigsaw puzzle constituted by the social context – or community of practice – formed by the high school class. This social gameplay represents a third narrative layer in *EGO-TRAP*. The data analyses from *EGO-TRAP* thus point to the fact that the students are negotiating identity through non-verbal performances at the individual exhibits.

This non-verbal negotiation of identity is framed and determined by the social gameplay and is identified as the third narrative layer in *EGO-TRAP* (Kahr-Højland, 2010b).

Why did they not engage in the meta-narrative to the same extent?

One of the reasons the students do not commit as strongly to the meta-narrative as to the personal test may be ascribed to a built-in problem in the design of *EGO-TRAP* – namely, the apparent clash of genres between the personal test and the meta-narrative.

*A clash of genres:* The students visit the Experimentarium as part of a school trip. On arrival they are introduced to a test, which is basically positivistic. Altogether, the setup is not far from a formal school setting. Students are familiar with this formal framework and indicate that it makes them feel comfortable. Ella, a girl aged 17, explains that she:

*(...)experienced (...)great confusion, (but) the woman called me and she was very good at, like, calming things down, and also, like, enabling us to relax in the situation, because she kept calling us, telling us what to do. (Interview with Ella, Kahr-Højland, 2010b, p.69, translated from Danish)*

The students know exactly what is expected from them (that is, to perform in a test) and what they themselves expect from the experience (that is, to get a clear-cut answer from the test).

When the hacker enters the scene, it marks a dramaturgical turn – and also, in fact, a radical change of genre as the hacker/rat story resembles the movies and computer games watched and played by the students in their spare time. The students express how the emergence of the hacker in the story confuses them: Ella states that “it wasn’t exactly what I was expecting (...) it was actually pretty surprising” (Kahr-Højland, 2010b, p. 75, translated from Danish) while Finn, aged 16, explains that “I didn’t understand the story at all at that time (...) All of a sudden the whole thing got a little too advanced.” (Kahr-Højland, 2010b, p. 75, translated from Danish)

*Playing with the conception of authority:* So, the hacker tends to stagger the balance between known and unknown, which was established by the personal test. The idea was one of urging the students to take a step back and look critically at the setup, using the competencies they normally use when solving problems in computer games. But this critical, investigative perspective collides with the positivistic framework of the personal test and thus leaves the

students in a stage of confusion and frustration.

The surprising clash of genres in *EGO-TRAP* does not account alone for the students' frustration and confusion. Let's play with the idea that *EGO-TRAP* had been implemented as an entertainment feature in a shopping mall. The point being, that the involvement of the hacker does not represent something innovative or surprising per se; in many ways the hacker story resembles the kind of movies preferred by the young target group. A focus group of students from high schools unanimously stated that among their favorite films were movies having an element of either conspiracy theory, or a surprising revelation implying a fundamentally changed perspective on the storyline. Movies like *The Matrix*, *The Sixth Sense*, and *A Beautiful Mind* were all mentioned as examples of this kind of movie (Kahr-Højland, 2010b). It is the fact that the hacker-story is implemented at a science center that is innovative and astounding. The rat/hacker story does not just represent a clash of genres as compared to the personal test, it also stirs up the concept of authority as it relates to the science center (as compared to, for example, a shopping mall). When the students arrive at the science center, together with their classmates, they submit to the (voice of the) woman. The woman represents the science center

as an institution and the students express that they regard her as an authority, which they follow blindly. They also express that they feel comfortable about this, as it resembles a well-known situation at school (Kahr-Højland, 2010b).

*The science center as an authority – and as a Paradigm II museum:* As science centers are traditionally associated with high professional expertise, the students look upon the woman as a figure of great authority. Science centers have been classified as so-called Paradigm II or Mode 2 museums (Pedretti, 2004; Nowotny et al , 2003, Kahr-Højland, 2007). Science centers were originally introduced as an antithesis of the traditional museum, also referred to as Paradigm I museums, in the 1960s. In traditional museums the emphasis is predominantly on the information provided rather than on the visitor. The traditional museum was built on the idea of enlightenment and the collection is often identical with the exhibition. Emerging from the idea of collecting information in order to make it available to the public, the educational point of view in the traditional museum is one of public outreach (Hooper-Greenhill 1999; Parry 2007).

The following model, suggested by Kahr-Højland in 2007, provides an overview of three museum

	<b>Traditional museum (I)</b>	<b>Interactive Museum (II)</b>	<b>Augmented Reality Museum (III)</b>
Primary focus	Information	Audience/ receiver	Information + audience
Media	Display case (+ boards, movies, DVD recordings etc)	Hands-on exhibits	Interactive exhibits + narrative structure + mobile technologies
Learning approach	Positivist	Constructivist	Social constructivist

Three different museum paradigms – an overview. (Kahr-Højland, 2007, p. 136)

paradigms of which the third is yet to come.

The opening of the first science centers in the late 1960s marked a veritable paradigm shift within museum communication. Based on the idea of Frank Oppenheimer, the science centers were planned to make the visitor construct her own knowledge by manipulating things in hands-on exhibits. Gone were the signs of *don't touch* and *keep silent* as well as the structured, guided tours. The classical science center with the element of free play at the core was born, and the success was so massive that the idea of interaction spread to traditional museums (Bradburne, 2001). Due to its emphasis on free play and interaction, the classical science center thus marked a change – a

paradigm shift – within museum communication, a paradigm stating that you are not only allowed to touch, you are actually supposed to touch and by that construct knowledge about a phenomenon.

The learning approach thus shifted from a somewhat positivistic approach to knowledge in the traditional museum to a constructivist approach in the science center/Paradigm II museum. But even if the approaches to achieve knowledge are disparate in the two museum paradigms, they both build on a basic ideal of knowledge, implying that “we” – the educators – know what “you” (the public) should know. Science centers and traditional museums are therefore both associated with a high degree of authority, as both kinds of museums present themselves as strongholds of knowledge.

*The third paradigm museum – facilitating critical reflection:* Today, we are experiencing a fundamental change in our cognitive conditions: knowledge is no longer considered as universal truth, but rather something that is open to debate (Nowotny et al, 200). As Barnett (2004) has argued, the students of today have to cope with the fact that they are “knowing-in-and-with-uncertainty.” It has therefore been emphasized from different theorists, as well as practitioners working in the field of museum

learning, that there is a need for a third paradigm museum, which facilitates open debate and critical reflection to a higher extent than is the case of the science centers (Henriksen & Frøyland, 2000, Pedretti, 2004, Bandelli, 2005, Quistgaard & Kahr-Højland, 2010b). A third paradigm museum that aims at supporting open debate and critical reflection by means of interactivity and flexible narrative structures facilitated by mobile digital technologies (Pedretti, 2004; Bandelli, 2005; Kahr-Højland, 2007, Quistgaard & Kahr-Højland, 2010b).

The third paradigm differs decisively from the previous two paradigms due to its prompting of social meetings and peer-to-peer communication. Traditionally, the museum experience has been predominantly individual, as visitors in Paradigm I museums have been expected to silently study the items displayed on their own. On certain occasions the introduction of digital technologies has even emphasized the individualized aspect of a museum visit. Audio guides, as an example, often tend to hinder conversations between visitors. Similarly, despite the explicit call for playing and talking, Paradigm II museums (i.e., science centers) are ultimately focusing on the personal interaction between the individual and the exhibit (Kahr-Højland, 2007).

*EGO-TRAP* as an attempt at realizing the third paradigm museum by challenging the science center as an authority: We are seeing the contours of a third paradigm museum emerging, as pointed out in Kahr-Højland, 2007 and Quistgaard and Kahr-Højland, 2010b. A paradigm reflecting the fact that “we” (the educators) no longer know exactly what “you” (the visitors) should learn. The audience is to realize that knowledge is open for debate and thus should be scaffolded in questioning the basic premise for presenting information within a museum. As argued by Quistgaard and Kahr-Højland (2010b), mobile digital technologies hold great potential as facilitators of personalized, as well as socially mediated, learning processes within science centers and museums. The potential of mobile digital technologies as key players is primarily grounded in four qualities of these technologies, identified as mobility, flexibility, communicative property, and media transparency (Quistgaard & Kahr-Højland, 2010b).

*EGO-TRAP* may be seen as an attempt to realize the third paradigm museum, as it does not aim to present definite truths. Rather, it aims at facilitating processes of inquiry and critical reflection. It does so by providing a semi-structured experience in an explorative milieu, which should scaffold pleasurable

engagement (flow), social learning processes, and critical reflection. The latter was thought to happen through verbal negotiations of meaning between the team partners in *EGO-TRAP* – initiated by the surprising challenge of authority.

*EGO-TRAP challenges the conception of authority:* The meta-narrative in *EGO-TRAP* does not just mean a change in genre as compared to the personal test. The idea of exposing that the “museum guide” (i.e., the woman) whom visitors thought would reveal scientific truths about themselves, is not who she pretends to be, was to give the visitors a great surprise – to give them a shock that would change their view on the communication situation at the science center and make them reflect critically. The disclosure of the woman as a rat was intended to urge the participants to question the basic premises for communication at the science center. But the scaffolding of this critical questioning of the basic premises for knowledge could have been more tangible than was the case in *EGO-TRAP*.

Some of the students in *EGO-TRAP* do actually question the premises for information provided by the exhibits. As an example, Ella, aged 17, gets very upset because one of the exhibits concludes that she is prejudiced. Ella does not understand the premises

for the conclusion – but even though she is disturbed and questions the validity of the conclusion, and even though she actually states that the experience in *EGO-TRAP* has taught her to “reflect critically” and to “always be aware of who the sender is,” she keeps talking about the result as “scientific proof.” She states that the experience in *EGO-TRAP* has scientifically proven what kind of person she is (Kahr-Højland, 2010b). So, even when the exhibit result goes against everything she knows about herself, she ends up trusting it because she credits the woman/science center as a greater authority.

*The third way of authority:* According to the Danish educational researcher, Lars Qvortrup, authority is basically about taking care of someone, much like a parent who takes care of a child by setting up rules for bedtime. In the past, authority was associated with uniforms and institutions. Then, after the anti-authoritarian period, authority was defined psychologically as personal authority. Today, Qvortrup states, we are approaching the third way of authority, where authority is related to competencies, for example your educational competency or your personal competency (e.g., as a doctor or as a parent) (Qvortrup, 2010). Authority may be challenged, for example, in a classroom where the teacher may

be confronted with viewpoints that are opposite to his or her own. By challenging authority, it may be either weakened or strengthened. Authority in a modern classroom is all about facilitating and steering discussions where everybody is allowed to express his or her viewpoints. This is not the same as creating a situation where anything goes. The teacher uses professional expertise – i.e., his or her authority – when facilitating the discussion.

The idea of the meta-narrative was to challenge the idea of the museum/science center as an authority. But challenging the concept of authority is not the same as weakening your responsibility as an authority. Actually, it means that you have to strengthen your responsibility as an authority – for example, by facilitating open-ended debates and by that, scaffolding critical reflection. As an example in *EGO-TRAP*, the science center could have assumed its responsibility as an authority for the students by facilitating an open debate about *EGO-TRAP* in direct continuation of the experience. This could have been put into practice, either virtually in a chat room or physically in a discussion group, where students as well as teachers could contribute to the debate facilitated by staff members from the science center. An even simpler solution could have been carried

out in the form of audio-recorded video clips, where visitors could express their thoughts and feelings when exiting the rat's room. By publishing the video clips immediately on an electronic wall, the comments of the participants would contribute to an ongoing debate about *EGO-TRAP*.

### Conclusions

In some ways, *EGO-TRAP* succeeds as an exhibition concept foreshadowing a third paradigm museum. The use of a flexible narrative structure facilitated by cellphones does indeed scaffold the visitors in a way that engages them pleasurably within the exhibition without compromising the explorative approach. The students report on the experience in *EGO-TRAP* with great excitement. They spent more than 1.5 hours in the exhibition, trying the exhibits again and again. So, *EGO-TRAP* succeeds in solving the problem of random button pressing identified as a common problem at classical science centers.

However, when it comes to the ideal goal of scaffolding critical reflection by challenging the conception of authority, *EGO-TRAP* could have emphasized the science center's role as an authority to a greater extent. The idea was to support critical reflection and to challenge the existing ideal of

knowledge. This implies a huge responsibility on the museum to hold visitors and guide them in their process of critical reflection and their questioning of the ideal of knowledge. By scaffolding open-ended debates in more tangible ways, *EGO-TRAP* might have supported the questioning of the premises for knowledge more effectively.

The museum may play with genres and challenge the concept of how to conceive and relate to knowledge, but the shaking up of authority within the museum does not mean that the museum should disclaim responsibility altogether. In fact, museums should take on their responsibility as authorities to an even greater extent by developing and supporting scaffolding remedies by which visitors can better understand and create information.

## Notes

1. EGO-TRAP was implemented in the main exhibition at the Experimentarium in Copenhagen, Denmark, in 2007. It will be open for the public until 2011 (<http://www.experimentarium.dk/EGO-TRAP>).
2. The term hands-on exhibits is used throughout this article covering the kind of exhibits used in science center exhibitions. It is an ongoing discussions at science centers worldwide whether to use the term hands-on exhibits or interactive exhibits. Many researchers working with science center learning argue for the use of the term interactive exhibits (c.f. Rennie & MacClafferty, 1996) while most science centers tend to stick with the original term hands-on exhibits (for example Tullahoma Hands On Science Center, Tennessee, Natural History Museum, Los Angeles, Science Museum, London).
3. The visitors are sent to different exhibits in order to avoid queuing up on the exhibition. Six exhibits (of which each visitor visits four) form level 1 in EGO-TRAP.
4. At the Satellite Dishes, the visitors are supposed to whisper messages to each other over distance by means two satellite dishes: if the visitors speak directly into the focus of the dishes, they are able to hear each other whispering over a distance of several meters. At Play with the Powers of the Air, the visitors are to play ball with a pair of blowing hoses. Each visitor has to balance a ball on an air stream and attempt to pass the ball through a ring by adjusting air velocity.
5. Since the term scaffolding was introduced by Jerome Bruner in the 1950s, it has been used in a widespread set of contexts and with various meanings. Building on Vygotsky's theory about the zone of proximal development,

Bruner et. al. describes a scaffolding as the framework (scaffold) a teacher establishes for a learner in order to help the learner to concentrate upon those elements that are within his range of competence (what Vygotsky call zone of development), (Wood, Bruner, Ross, 1976, p. 90). In this context the term scaffolding is used in the broad sense of providing "instructional guidance" for a learner. (Kahr-Højland, 2010b)

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# **Mobile Gaming No Strings Attached?**

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Mobile gaming is one of the fastest growing fields of game development.<sup>1</sup> By 2013, more than 38% of the world's population is predicted to own a smartphone.<sup>2</sup> Of those, roughly 47% will play games on them.<sup>3</sup> In fact, after checking the news, we spend more time playing games on our phones than anything else.<sup>4</sup> We carry them with us everywhere we go, and to anyone around 25 and under who grew up with a mobile phone, they are the gateway to gaming.

There has never been a more universal way to play games, and at a fraction of the cost of developing a console game, they are within reach of many museums. Release a game into an app store and you will be competing for those new audiences in a global marketplace – though against a host of full-time game production companies. These people spend all day everyday thinking up the next brilliantly addictive game, they might even have millions to spend making that happen, but more importantly, unlike you, they have no constraints on what they produce other than “it must be a great game”.

You might hire one of them to make your game, in fact you probably should, but you will always have a reason for making a game – your mission statement. Whether that's to increase the understanding of art, science or history it comes with strings attached:

objects, a location and a lot of preconceptions about what you do.

Generally, this boils down to two core points: education and audience development. Historically, we've heralded the dawn of any new platform that could offer us a way to educate or engage as a potential mine of new audiences – whether it's been on the street, online or in an app store. Mobile lets us see exactly who is using our apps, where they are and what they're interested in. We can pinpoint what appeals to our existing audiences and, roughly speaking, locate where they are and where they aren't.

Unfortunately, when it comes to mobile games, we know education doesn't sell. Educational games account for just 0.1% of the average gamer's app use across iPhone, iPod touch and iPad. Those that do sell, fall into two categories: games for children – which tend to work by stealth – and directly educational games like *Brain Training*, *Sudoku* or *Learn to Drive*. As an adult downloading these, they help us (or our children) learn the things we already know we should know, but don't have the time – or motivation – to learn in our everyday lives. Culture, like maths, is something we all feel like we need to do better at, but rarely have the time or motivation to put this into practice.

Through their reach and ease of access we're now starting to see games as a way to engage new audiences by stealth. After all, many of the core principles of gaming – acquiring extra skills, levelling up, remembering what happens when you poke a pumpkin – all require leaning in some way.

Stealth, though, is rarely very stealthy if you stick a museum logo on your app. As a museum you are automatically associated with education, your new audience won't be fooled into thinking your app isn't about learning, and they won't implicitly think it will be fun. Your app needs to either meet your new audience where they are – thinking that culture is hard and boring and offering a magical easy-to-swallow solution – or completely bamboozle them with the most covert unbranded fun they've ever had since *Angry Birds*.

The first of course, seems easiest to do, but in fact it's probably the most difficult to get right.

The solution

Lack of knowledge or enthusiasm is a kind of poverty. When companies design products and services for the poor, they often think about making them as cheap as possible. But whether you're tapping into a market opportunity or addressing a social need,

it's important to acknowledge such factors as status, aspiration and dignity. No one wants the world to know that they don't know or care about something they feel like they should care about, and if there's an established method of engaging with that thing – be it in an art gallery or a classroom, that person isn't going to want to signpost their apathy by doing something different.

We saw this with *Tate Trumps*, which was only playable at Tate Modern. Two months into its launch we started to see visitor comments like this:

*Not everyone can get there immediately so this app's just disappointing. Why not include some cards to play away regardless of location then when I am in the area I'm more likely to pop in! Now I'm just annoyed.*

Mobile gaming is pervasive, but it fits around the big boring bits in our lives: commuting, eating, sleeping, and that holy throne of gamers – the toilet. Rarely, if ever, does it come into conflict with something we either want to, or feel like we should be doing, like going to an art gallery.

If you're going to clearly name your app as your own production, you need to be honest with your users and acknowledge that their motivations to learn are yours too. Find out what they feel the worst

about not knowing and make something that will be the *Sudoku* of learning that one thing. Whether it's *Kings and Queens of England*, the periodic table or knowing which art movement came after which to impress your friends – people want to feel like they are taking responsibility for their own learning, and they can't do that if they feel like they didn't do it of their own volition.

The things people want to learn from mobile apps are usually very broad topics, so it might help you to release the game with your brand as a sideline to the main theme, *Tate* after all isn't as well known as *Art* to someone on the other side of the world. It's also worth noting too that *Education* in the Apple App Store receives twice as many downloads as *Educational Games* do – so it's probably worth putting it in this category too.

Making an app like this won't win you awards, winning awards usually means making something new, but it's worth remembering that your user's needs are rarely new and ground-breaking.

The bamboozle

The other approach, of course, is to make a game so amazingly brilliant that your new audience will want to play it for its own sake. Doing this might

win you an award if that's what you after, but it will more than likely also mean not putting your name anywhere near the finished product.

This might sound risky, but findability is an issue in any app store, with or without your brand. Unlike the web though, where new users might find you by searching “really big Victorian hats”, the content inside your app is hidden from a search engine. This means you're at the mercy of new users finding your app either by its category, its title, or by the number of downloads or recommendations it has.

Your new audience won't expect you make a game, so it's unlikely they will search for you. Recommendations and downloads too are hard to get when your working with an audience that will be suspicious that your game is either educational or a marketing stunt, as mentioned earlier.

This might sound sceptical, but whilst people don't buy a mobile game because of its publisher, investing time in a game is an investment like any other; it's a relationship of trust, and just as you wouldn't trust an estate agent fix your toilet, most people wouldn't trust a museum to make a good game.

Producing a game in this way will put you on a level playing field with other games producers. In

fact, for once you might be at a significant advantage. People have been trying to pin down what makes a good game since we first started to play, but what unites almost all the most popular games is that they are universally appealing, without instruction, to both young, old and seemingly uninterested alike. They are rewarding to play and, crucially, have a strong story behind them.

This is where your expertise really comes into its own. Each object you look after probably has a million stories it could tell, but behind these are even bigger stories – whether that’s a narrative story like love or loss, or physical stories like how electricity works. Games like *Civilization*, for example, are interesting because they give you the opportunity to be part of a story, changing the effects of things like water, housing and money on the way societies work. The Science Museum’s game, *Launchball*, gives you the opportunity to find out how heat, light and sound work. Neither of these games would have been as interesting if they were connected to a prescribed course of events – the fall of Rome or the life of Thomas Edison. The key is that you learn by doing and exploring.

If you’re going to act like a games publisher though, you’ll need to be committed to behaving

like one. Regular updates are crucial to showing users that the time they spend playing your game is going to be rewarded with more content. You'll also need to think about the way you sell your apps; making things free is the default position in our museums, but research has proven that mobile gamers are more likely to keep playing your game if they've paid for it. The games industry has been incredibly successful at preventing piracy, so most users will expect to pay for a good game, even if they do download a free lite version first. Marketing too is important, but you can save on having to build in extra budget for this by thinking of elements from your game that could become sharable, or play an active part on social networks.

Probably the most useful thing you can do of all though is to start playing games. It might sound obvious, but it's remarkable how many people commission games on a particular platform without ever playing any. If you want to make a mobile game – and hey, why wouldn't you now? – buy a smartphone and play like mad. It'll soon become obvious which ones you want to play and why, and you might just have some fun in the process.

## Notes

1. <http://blog.flurry.com/bid/31566/Apple-iPhone-and-iPod-touch-Capture-U-S-Video-Game-Market-Share>
2. <http://m.momads.eu>
3. [http://www.comscore.com/Press\\_Events/Press\\_Releases/2010/4/Smartphone\\_Adoption\\_Shifting\\_Dynamics\\_of\\_U.S.\\_Mobile\\_Gaming\\_Market](http://www.comscore.com/Press_Events/Press_Releases/2010/4/Smartphone_Adoption_Shifting_Dynamics_of_U.S._Mobile_Gaming_Market)
4. <http://blog.flurry.com/bid/30548/Flurry-Smartphone-Industry-Pulse-January-2010>

**Mobile Phones for Informal  
Science Center Learning:  
A Socio-Technical Analysis**

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The mobile phone is arguably the greatest success story in the history of communication technology: in less than a generation, the technology has gone from zero to more than four billion users around the world. Understandably, given the mobile phone's enormous popularity and seemingly non-stop use by people of all ages and backgrounds, science centers and museums want to consider how to use the technology. The excitement in the museum community over the mobile phone's potential for free-choice science learning included one of America's leading centers, the Liberty Science Center (LSC), which is located in Jersey City, New Jersey, across the Hudson River from New York City. In this chapter, we review our perspective of the way museum/science center visitors generally, and LSC visitors in particular, have responded to mobile-device-driven opportunities to engage in content. Needless to say, the views expressed are our own and do not necessarily reflect those of any institution.

#### Background and data collection

In 2006, LSC received a grant from the National Science Foundation (ISE-#0610352) for the *Science Now, Science Everywhere* project. *Science Now, Science Everywhere* yielded the acronym *SNSE*, which was

pronounced *sensei*, meaning teacher or mentor in Japanese. *SNSE* was designed to explore the unique learning opportunities that are possible when visitors use their mobile phones as tools for learning in a science center environment. Specifically, LSC believed that visitors, by using their phones, would have more intellectual commitment or sense of ownership over their learning experiences. This in turn was believed to lead to continued use of the content they had acquired from the science center after their LSC visit. *SNSE* was designed as a mobile learning initiative to enable the public to interact with exhibits, retrieve content, and extend their learning by using their mobile phones. The program aimed to encourage visitors to use *SNSE* both on-site at the center and off-site. LSC developed a variety of mobile activities, including:

- Dial-in audio content
- Texting to an exhibit interactive
- Texting to receive web links
- Saving of designs created at the museum
- Camera phone challenge.

A fundamental tenet of the *SNSE* project was to make use of the visitors' own personal technology devices, specifically their mobile phones, as an extension and

enhancement of the free-choice learning that would stem from the LSC's resources and exhibits. By asking the visitors to use their own devices, rather than lending them devices to use during their visits, LSC staff members hypothesized that they could increase visitor interaction with the content material after the visitors have left the institution. Through using their own devices, their sense of intellectual ownership over the content material might increase. In addition, if visitors were able to share content with others, it might encourage post-visit review and reflection on the content material. All of this would serve to enrich the visitors' depth of knowledge and appreciation of science, technology, and related fields.

LSC underwent a major renovation and expansion during the *SNSE* grant period, reopening in July 2007. During the 22 months the facility was closed, a prototype of *SNSE* was installed in the LSC's temporary facility at its nearby facility in Riverside. This prototype offered audio content to a predator/prey exhibition entitled *Eat and Be Eaten*. When the refurbished main facility reopened, *Eat and Be Eaten* was reinstalled at the main LSC site and included *SNSE* audio content. Two other exhibitions at the renovated building were also designed to include *SNSE* components: *Communication*, which focuses

on the evolution of human language and the ability to communicate abstract ideas, and *Breakthroughs*, a small multimedia temporary exhibition space. In the months following the re-opening of the building, LSC incorporated other *SNSE* audio stops throughout the building. In total there were 36 audio stops, one text-in bookmarking feature, two text-in exhibit interactives, one multimedia messaging service (MMS) exhibit interactive, and the camera phone challenge.

LSC drew upon two groups to help advance understanding of the potential uses of mobile communication in their facility with an eye towards enhancing opportunities for informal science learning. The Rutgers University Center for Mobile Communication Studies, led by James E. Katz, was the Research Partner on the *SNSE* project, and its work focused on teen use of mobile phones in general, and of *SNSE* in particular, at LSC. Data was collected at several junctures. The Research Team monitored three community evening events during which time families whose children were from economically disadvantaged school systems could visit the museum free of charge. Observations were also made of students on field trips to the science center. More general observations were made of



Figure 1: Exit interview process arrangement [Source: James E Katz]



Figure 2: Observational data collection by ILI observer [Source: James E Katz]

visitor experiences, including post-visit interviews and visitor movements on the exhibition floor. The team also visited other museums and science centers to form a baseline of mobile phone use in informal learning environments.

The Institute for Learning Innovation (ILI) team, led by Kate Haley Goldman, conducted front-end, formative and summative evaluation of the *SNSE* project. The formative phase of the evaluation was aimed at providing periodic input throughout the project's cycle of development to help with suggestions for refinement. The summative evaluation was designed to compare actual use of exhibition components, overall enjoyment, self-perceived learning, interest in science and technology and post-visit use of and connection to the material. The mixed-methods design was constructed to observe visitors actually using *SNSE* with the exhibit components, interview both *SNSE*-users and non-users as they left the museum, and interview them again six or more weeks after their visit. Thus the investigators would be able to compare users and non-users both on exit and then six or more weeks later. (The exit interview process is shown in Fig. 1; data collection by ILI observer is shown in Fig. 2.)

Specific methods used in the summative

evaluation included exit interviews at LSC, follow-up telephone interviews with those who had completed exit interviews, visitor observations at *SNSE* exhibits at LSC, and analysis of data collected by LSC through the back-end of the *SNSE* exhibits themselves.

Exit interviews were conducted at LSC from August 15–29, 2009 on both weekdays and weekend days, primarily in the afternoon. A total of 158 exit interviews was completed; 59% of the exit interviews were with non-*SNSE* users and 41% were with *SNSE* users. Due to the sampling method used, *SNSE* users were interviewed at a higher proportion than they naturally occurred in the science center.

Telephone interviews were conducted by ILI staff using the contact information provided by visitors on their exit interviews. Telephone interviews were conducted from November 20, 2009 through February 2, 2010. Two-thirds (66%) of those interviewed at the science center agreed to participate in the follow-up telephone interviews and provided contact information. Of those for whom contact information was available, 36% completed a telephone interview. In total, telephone interviews were completed with 38 individuals who also had participated in the exit interviews; 58% of the phone interviews were with non-*SNSE* users and 42% were with *SNSE* users.

All visitors who completed a telephone interview received a \$10 gift certificate for Amazon.com.

Visitor observations were designed with the goal of better understanding the experience of *SNSE* users and non-users at *SNSE* enabled exhibits. Quantitative data included engagement level and time spent at the exhibit. Descriptions of the visitor's interaction with the exhibition and with other visitors or LSC staff were collected qualitatively. A total of 365 observations of visitors at *SNSE* exhibits were completed between August 15–29, 2009 on both weekdays and weekend days.

Science center visitors and the mobile phone  
*Are SNSE users different?* Prior reviews of mobile phone use in museums have tended to focus on art and historical institutions, and much of the development of mobile phone functionality is currently directed for use within those institutions. (Center for History and New Media, 2010). To whatever extent there may be public expectations surrounding the use of mobile devices for free-choice learning in an institutionalized setting, it may well be that these are predicated on the art/historical model. This presumed identification and sense of utility may carry over to color user perceptions in a science-related environment. Hence,



Figure 3: Display signs for SNSE in entry lobby [Source: James E Katz]

in the first instance, the *SNSE* project differs from traditional mobile free-choice learning in that it is situated in a science center, and thus the audience composition may be significantly different than in art and historical institutions.

Another factor to bear in mind is that it appears that most if not all visitors to LSC are there in a socially connected capacity, or to put it differently, there were very few, if any, solo visitors to LSC during the period of study. For example, all those at the science center with whom evaluation interviews were conducted turned out to be part of a group (the mean group size was 4.3 individuals). The majority of visitors (72%) were in a group that included adults and children (ages 12 and under). The group nature of LSC



Figure 4: Display sign in front of the *Eat and Be Eaten* exhibit [Source: James E Katz]

visitorship was further reinforced by observations during the *community evenings* at the LSC. (These were designed to bring school-age children, along with their parents/guardians, who were from New Jersey's economically disadvantaged schools to LSC. So while the point is not entirely surprising here, it does reinforce the fundamentally social nature of the visit to the science center.) Visitors tended to have an extended stay at the science center: with 55% spending more than three hours and 31% visiting for two to three hours. The majority of visitors interviewed (60%) had been to LSC previously. So while these data paint a picture of the LSC visitor, and highlight the socially embedded nature of the visit, it may well be

that they vary from visitors to arts, history, or other cultural institutions. Unfortunately, we do not have data that bear directly on this point. However, the data does reveal that only 7% of those who were asked had used their phone at another museum before. *SNSE* users were no more likely than non-users to have used their phone at another museum.

Evaluation revealed few differences between *SNSE* users and non-users. There were no differences between *SNSE* users and non-users in the interviews based upon demographics, group type, or time spent in the science center. There was no significant difference between *SNSE* users and non-users in the observations based on crowding levels in the exhibition areas, age of the user, education level, group type, or previous visits to Liberty Science Center.

There were significant differences in *SNSE* users compared to non-users in a random subsample of the observations, with regards to the following factors (based on a sample size of 83, including 21 *SNSE* users and 62 non-*SNSE* users):

- Gender ( $p=.000$ ). Males were more likely to be observed using *SNSE* than were females.
- Website use ( $p=.032$ ). Those observed using *SNSE* were more likely to report that they had used the Liberty Science Center website than non-users.

There were several indicators that visitors who did use *SNSE* functions while at the LSC did so in a social way. Nearly half the visitors used some method to listen to the audio content in a shared fashion. This included, for instance, handing the mobile phone back and forth between a small group or family of visitors. For activities that involved texting information to the exhibit or sending created content, *SNSE* users were more likely to engage in conversation than non-*SNSE* users. Of those who used *SNSE*, the vast majority did not make use of the science content or share it with family and friends once leaving the institution. (At the same time, through interviews of visitors we did find numerous instances of young people using their mobile phones to take pictures of interesting exhibit items and then saving them for future sharing with friends or personal memories.)

Generational differences manifest themselves in people's attitudes about phone use in public places. Many interviewees for the research study, especially parents, said that they felt they should not use their mobile phones in LSC unless there was an emergency situation. However, it is also important to understand that for some of these informants, using mobile phones to coordinate with other visitors in LSC would qualify as one of those emergency situations.

Researchers also observed that upon entry to LSC, and while still in the atrium, there were instances when school children were asked by their teacher to check whether they brought their mobile phones. If so, they were asked to turn them in for safekeeping during their visit to LSC. This seems to indicate that teachers have maintained normal school-based constraints on mobile phone use during their visit to LSC. At the same time, during the nominal collection process, some students were still using their phones to take pictures of the entrance area. This reinforces our belief that mobile phones do have significant promise as an “on-ramp” for informal science learning, albeit from a visual learning dimension. Perhaps there are even greater possibilities for the mobile phone in terms of individualized or personalized learning growing from the LSC experience.

Interestingly, this observation also raises a salient question as to whether there exists a gap between formal and informal learning contexts. Understandably, unlike the digitally minded younger generation, teachers and parents follow the conventional social norms to which they have long been acculturated, namely that there should be no phone use in public places, and especially not in museums. This appeared to be the reason many visitors

misinterpreted the signage. Although the signs were an invitation to use a mobile phone, a cursory glance by most visitors led them instead to interpret the signs as being a message proscribing use. (See Figs. 3 and 4.) This was because the message of non-use was already primed in the visitors' minds. Visitors perceived that mobile phone use in public places such as LSC was inappropriate because it might interrupt other visitors' experiences, or that they were barred from using them by museum policy. Here, researchers observed that social norms and social priming played a role among visitors' use, albeit the opposite of the way desired.

*Does mobile phone use change the exhibit experience?*

There is some evidence that visitors who used *SNSE* have a deeper interactive experience in terms of time spent. For the activities that involved texting the exhibit or receiving a picture from the exhibit, *SNSE* users were significantly more likely to complete the activity than non-*SNSE* users. Visitors who texted the exhibition component or used their phone to save content they had created showed increased interaction, including more pointing at the component and more social interaction. During the exit interview, *SNSE* users were more likely to report having learned something new while at LSC. They

were also more likely to report having become more interested in science and technology during their visits, and having talked with others about science or technology during their visit.

Those changes however, did not necessarily mean that the *SNSE* users that we interviewed in the months after their visit generally remembered the *SNSE* activities. Approximately half of those interviewed had negative memories of the *SNSE* experience, either due to the audio quality or due to the confusing or dysfunctional nature of the activity. We do not have any evidence that the visit experience was more enjoyable for those who made use of *SNSE* functions. *SNSE* users did not report enjoying their visit more than non-*SNSE* visitors in the post-visit interviews. In recalling their use of *SNSE*, none of the users reported it was most memorable aspect of their visit.

*Potential obstacles to visitor use:* As mentioned above, there are still significant logistical barriers in implementing mobile phone use within a museum context. While the majority of those who attempted to access audio *SNSE* stops were able reach the content, hearing the content was a problem for many people. A third of those using an audio stop reported that they had difficulties hearing the content.

For those coming to LSC in the company of

friends or family, there is sometimes a complex dynamism between interaction with distant others and the accompanying (“co-present”) friends/family members. Apparently, there is considerable variation in how individual visitors choose to interact with co-present others *vis-à-vis* distant ones whom they are in contact with via the mobile phone. This has implications for potential interest in on-site mobile communication-based learning services.

There is also a dynamic relationship between involvement with the exhibits and with co-present others, due to childcare responsibilities, visitors feel that they cannot become involved in the often solitary investment of the *SNSE* service. One example, of this was when we encouraged a parent to use the *SNSE* activity, he kept reminding us, “Please help watch my kid.” This example also highlights the dimension of interpersonal management which impinges on use of the mobile content.

Similarly, for some parents, a visit to an informal learning institution like LSC should be an occasion for parent-children interaction. In this situation, *SNSE* would seem to become a medium that works precisely against those with such a motive for visiting. Indeed, we observed a parent patiently teaching his kids about each exhibit in the *Eat and Be Eaten* area

and also using a digital camera to take pictures of the animals. Hence, given these considerations, it may be that in terms of future technical development, that a learning activity would be more effective if it allowed for dyadic or group-level involvement (e.g., a visual guide downloadable on the mobile phone and a group of students can watch it on one student's phone). This echoes the finding noted above that nearly half of the visitors used the mobile content in a social way.

Yet the potential conflicts of different learning spaces are highlighted here not only in a conceptual sense. We found that physical settings are also an important factor that may affect mobile learning in LSC. Specifically, and as alluded to above, when people are in the virtual learning space using their mobile phones, the physical learning space is usually teeming with other visitors. We asked a few visitors for their evaluation of their initial *SNSE* trial, and received many responses that the ambient noises made it difficult to hear the exhibit descriptions through their mobile phones. Hence in terms of design considerations, it is important to incorporate the concept that visitors using *SNSE* might encounter a situation with conflicting learning spaces at several points.

*Visitor social use:* One important finding, possibly even due to the difficulties in hearing the audio

content, was the social use of the material. Many audio stop *SNSE* users did put their phone on speaker to share the content with the entire group; 38% of audio stop users (14 out of 38) reported using their speaker phone function. Another 8% of audio stop users (3 out of 38) reported sharing the phone from person to person so that multiple people could listen to the content even though the phone was not on speaker. As a result of these two techniques, 45% of *SNSE* audio stop users listened to the audio content as a group.

Why do visitors seldom use their phones to interact with the exhibition?

One critical factor that had an impact on each of the potential outcomes was the extremely low use of *SNSE* overall, estimated in the summative report to be approximately 2% of the LSC visitation.

Non-users of *SNSE* were asked why they did not use their mobile phone to interact with the exhibits. Nearly a third of non-users (31%) were simply not aware that *SNSE* use was an option during their visit and another 9% did not have a phone with them during their visit. However, 60% of non-users were aware of *SNSE* but chose not to use it. Visitors who were aware of *SNSE* but did not use the system had diverse reasons for choosing not to do so, including:

- Using their phone in the museum was not appealing (44%)
- Being focused on child-care (17%)
- Not wanting to pay a fee for the call (15%)
- Not wanting to do a particular activity (9%)
- Being unclear about what the activity was (9%)
- Not knowing how to use their phone to do the activity (6%).

Despite the fact that provocative questions were asked as part of the signage to encourage mobile phone use as part of the *SNSE* exhibit, it was not clear to the visitor that the mobile phone-provided information was actually germane to what the visitor wanted to know about the exhibit. The stimulus to prompt the user to engage the service may not have been sufficiently compelling in light of the obstacles to use and the lack of social cuing to obtaining exhibit information via the mobile phone. Also, as noted above, the user is not primed either to interact with exhibits using the mobile phone or to gain information in this manner.

Low use is a barrier to understanding mobile phone potential

We still lack a full picture regarding what prompts visitors to use their mobile phone to interact with an exhibit, due to the low level of use. Awareness of *SNSE* functionality is an issue (nearly a third of the non-users were unaware of the *SNSE* capability) that better marketing and signage might address. Visitors had other significant concerns or obstacles that prevented them from participating. While for some visitors not knowing how to use their phone or not understanding the activity was a barrier, the majority of visitors understood the concept but were not interested in participating.

After reviewing *SNSE* and related mobile phone projects, we would observe that the low use rate is the most significant obstacle to both the collection of data and to deeper understanding of the experience of mobile phones in informal learning settings. An argument could be made that museums have failed to convince visitors that using their phone to engage with the institution will be worth the trouble. While there are not many published reports of the use rates of audio content in museums, the few accounts that exist suggest that in many institutions a 10% uptake rate is considered successful for audio content in

a permanent collection (Proctor, 2010), although some institutions experience use rates as high as 17% (Luke and Stein, 2006). This is a primary issue, and understanding barriers to use for visitors remains one of the key issues for continued exploration.

Teens as early adopters for phones in the museum setting: the weakness of traditional descriptions of adoption patterns

In the grant, LSC hypothesized that teenagers were by nature, early adopters. To quote the original Co-Principal Investigator, Denise Bressler, in her 2006 paper for the *Museums and the Web* Conference, “We believe that if we accept the teenagers’ mobile culture and design learning activities specifically for them to use with their phones, young people will find the SNSE activities familiar and enjoyable.” (Bressler, 2006)

The classic text in the study of the adoption of new ideas and technologies is Everett Rogers’ book *Diffusion of Innovation* (2003), originally published in 1962 and most recently updated in 2003 to include phenomena such as video games. Rogers formulated distinct population segments including the Innovators, the Early Adopters, the Early Majority, the Late Majority, and the Laggards. Each segment has different characteristics and reacts to innovations in

a different fashion. According to Rogers, innovators make up about 2.5% of the population, early adopters another 13.5%, followed by equal segments of the early majority (34%), late majority (34%) and then finally the last 16% of the population, the laggards. These percentages form a bell curve. In his model, adoption of innovation generally spread throughout the society on a rightward-stretched S-shaped curve, with one plateau early on as the innovation was changing, followed by a rapid escalation in users (the *tipping point*) followed by another plateau as the laggards eventually adopt the innovation. Although often called theory, the work of Rogers may be more accurately characterized as a set of inter-correlated variables that co-mingle psychological openness to innovation, economic calculus broadly defined, and perceived attributes of a given innovation.

In Rogers' *Diffusion of Innovation*, he explains that innovations vary greatly in their perceived attributes. These perceived attributes help explain why some innovations, such as mobile phones, are adopted quickly, while others, such as seat belts in cars, require decades to reach widespread adoption. These perceived attributes of the innovation, in combination with a variety of other variables (for example, nature of the social system, and communication channels),

determine the rate of adoption of the innovation. The adopter categories have different values and characteristics.

The Rogers model has not been borne out in terms of mobile phone use for informal science learning, as the *SNSE* research team documented. Researchers concluded that while mobile phones were pervasive at LSC, they were not frequently used to interact with the content. To quote: “Specifically, we have the paradoxical finding that many people do use mobile phones extensively in the LSC, but not for the purpose of interacting with the exhibits or for informal STEM learning” (Katz, 2008). It might be said that the time span for adoption in museums and science centers has been short, and therefore society is still at the very early (and bottom) portion of what might be an extremely attenuated S-curve. That said, it is also the case that the mere presence of technology does not lead to its adoption, no matter how attenuated its S-curve might be. The problems we have seen in terms of the mobile phone technology nested within the science center have a great deal to do with other factors, including the perceived added value of the audio material, ambient noise conditions, and the social setting.

*Other potential frameworks for understanding visitor use:* One project assumption had been that possession

of a mobile phone, and avid use of that phone as an early adopter, would translate into use of the phone to undertake particular activities within the science center space. Knowing who was an early adopter might have allowed museums to predict who would use this functionality in the future. Therefore the Diffusion of Innovation model could have been useful to other informal science education institutions if we could have operationalized early adoption within this context, helping the science education institutions understand the technology profile of their visitors. As the project progressed, we acknowledged there remains a substantial gap between adopting a technology (a mobile phone), particular features of that technology (texting) and the desire to use a given feature in every context. Texting is a means to satisfy a particular need, such as coordination of family schedules, reinforcing a sense of closeness with one's friends, or even killing time. However, despite the heavy use of texting in such contexts, it does not necessarily follow that users text in order to further their learning goals. One analogy would be to say that simply because one owns a car and likes to drive to certain places, one is *ipso facto* interested in driving to a given place.

During the formative evaluations of *SNSE* and

through the Rutgers team research, ILI determined that the Diffusion of Innovation theory was not the best fitting model for looking at visitor adoption of these technologies in the museum. While we could at times characterize visitors into Rogers' categories, these seemed less predictive of actual use within the museum. As the evaluation developed, suggesting the original LSC hypotheses might not be borne out, ILI considered a number of other theories on the adoption of information technology besides the diffusion research. One approach ILI considered was the Technology Acceptance Model (TAM) as first described by Venkatesh and Davis (2000. See also Mathieson, Peacock, & Chin 2005, Ma & Liu 2004). It is possibly the most widely applied model of the acceptance of informational technology and is generally believed to be more predictive and robust than other models. In the TAM, perceived usefulness and perceived ease of use, in combination with a variety of external variables, are seen as the key factors in influencing attitudes towards the adoption of a technology. Those attitudes then contribute to the intention to use the technology and the actual use of the technology. Visitors might use their phones within the museum setting if they perceived the activity to be useful and/or they perceived the activity to be easy

to use. Yet this proved very difficult for visitors in the formative studies to gauge, as the usefulness or ease of use of prototype or hypothetical prototype was too abstract.

Towards the end of the project, as we began to examine the results, we turned towards a framework known as the *Domestication Approach* to the adoption of technology (Haddon, 2003). As Ling articulates in his discussion of the domestication perspective, adoption is a process, centered in the everyday life of an individual within a particular context (2004). To adopt a technology, one needs to be able to imagine the use of that technology, appropriate it for one's own, and incorporate it into one's habits or practices. Domestication is not solely an individual process, but takes place often as a social interaction between individuals. TAM theories would suggest that visitors need to be able to imagine using the technology, understand why the technology would be useful to them, perceive it to be easy to use or worth using if complicated, and adopt the use of that technology into their practice.

Yet another perspective that could be taken on our results is that of *Apparatgeist*. This perspective, advanced by Katz and Aakhus (2002), emphasizes the cultural setting of the technology and the way

in which status accrues to the user (or nonuser) of any given technology. Most important is the role of the technology in social relationships. Apparatchik is more compatible with the perspectives taken with what is known as the social construction of technology, and is rather far from the Rogers model, which emphasizes, rather tautologically, the individual psychological characteristics of openness to innovation as predictors of innovativeness. Because the mobile phone is generally perceived as a way to communicate rather than a method to access information (at least until the advent of the iPhone and droid circa 2009), it is not entirely surprising that it would continue to be used this way by museum visitors. In terms of utilization patterns of young people, they tend to be extremely skeptical of institutional manipulation, but also extremely sensitive to social hierarchy and competition. Thus as an alternative or supplement to the “demand-response” method of information delivery, which characterizes *SNSE*, socially meaningful activities might be more usefully paired with the mobile phone. For example, socially engaging competitive games, especially those that involve physical exploration of the science center’s space, might prove to be a fruitful direction for future development. Despite the absence

of enthusiastic uptake at LSC, there seems to be little question that the mobile phone can be useful for informal science learning at several levels, ranging from coordination of group activities and sharing of assignment information to data collection and intellectual engagement. Perhaps the key is to find the methodology and content that works with the social interactive interests of the center visitors, rather than adding additional narrative layers to the information which is offered at the exhibits themselves.

#### Social connectivity and environment

An over-arching conclusion of our analysis to date is that mobile phones are heavily used by visitors to LSC, but it is much more for spontaneously connecting with the visitor's social networks and for coordination purposes than for informal learning as defined by the SNSE project. However, the seemingly paradoxical finding of heavy use for social networking and coordination, but much less for exhibit interaction, makes sense from a social interaction perspective. It is rather the case that most visitors are immersed in a rich social network of relationships with other people. Moreover, given the evolution of communication technologies, including the proliferation of mobile phones, visits to the museum or science center are

increasingly taking place against a social background that requires coordination and contact. This is due to the fact that if a technology allows communication, it becomes incumbent on members of the social network to allow each other to be in contact with one another, and this is most especially the case of families that have childcare responsibilities. Upon entering LSC, the visitor is not cleaved off from these external forces; communication technology now allows or even seems to demand a form of perpetual contact with socially relevant but physically distant others.

In fact, this high level of mobile phone connectivity for visitors to museums can disturb other co-present visitors. It seems that this is a motive behind no-mobile-phone policies of some museums. We noticed in other museums that even when no-mobile-phone policies are prominently posted, users (and sometimes guards) furtively use their phones. Moreover, use is seemingly becoming normalized among visitors despite the attempts by museum authorities to control such use.

This may be illustrated by drawing on our comparative analysis of some New Jersey and New York museums. Observations were conducted at area museums in the fall of 2008 to provide a rough comparison point for understanding museum

visitor behavior *vis-à-vis* mobile devices. During this observation period, several verbal duels were witnessed between guards and patrons over mobile phone use. Despite prominent supporting signage that was visibly posted in many exhibit areas, guards had to frequently prompt visitors who were using their phones in forbidden areas to stop using the devices. Sometimes users responded by challenging the guards, who had to provide arguments to the visitor as to why mobile phone use was not allowed. In one case, a shouting match ensued and the guard had to threaten to issue a citation to a recalcitrant mobile phone user. These incidents suggest that the fulcrum of normative behavior is moving towards museums having to justify their strictures on phone use to their visitors, rather than the other way around. This point is significant for the following reason: visitors are seemingly increasingly accustomed to using their mobile phones for coordination and communication with socially significant others. By contrast, even though visitors are well accustomed to these social uses, having practiced them extensively in the ordinary routines of their lives prior to visiting LSC, they have little or no experience or expectation concerning using phones to interact with ambient information resources. Thus there is no behavioral

priming or baseline that would encourage users to begin using their mobile phones for informal science learning, even should there be initial interest in using their mobile phones to do so.

Despite the non-obvious connection of the mobile phone to informal science learning, there is clearly enormous enthusiasm for mobile phone use among visitors to LSC. We observed that phone use (voice as well as message checking) is quite common in LSC, especially near the entrance area and as visitors move from one exhibit area to another. Also, visitors take photographs of exhibits using their mobile phones (and of course with digital cameras as well), though the frequency varies considerably by exhibit.

Going beyond the content of exhibits themselves, we would like to highlight at a conceptual level the contrasting use patterns for mobile phones: frequent use for external communication versus infrequent seeking of additional learning opportunities via exhibits. This contrast provides an opportunity to consider how the *SNSE*-related technology could be modified to the findings to date; we pointed to some evidence which suggested that individuals' mobile learning in LSC may be related to the nature of and relationships to accompanying visitors. Attention could therefore be profitably directed towards

helping visitors understand the new paradigm of mobile phone interaction with the exhibits that is being fostered at the LSC, but done in such a way that is responsive to the socially embedded situation in which visitors find themselves. This of course also goes to the heart of differential social standards regarding appropriate mobile phone use. Lastly, attention should be directed to the problem of interference that visitors may experience. These sources of interference may come both from areas surrounding the exhibit spaces as well as from others within the space. Much of the user feedback we received indicates that physical settings and interaction with co-present others are important dimensions that can work to reduce the use of mobile devices related to *SNSE*. Sources of interference are manifold, clearly, and many were outside the control of LSC. Yet, to the extent possible, consideration should be given to how to minimize various sources of interference on mobile learning.<sup>1</sup>

#### Conclusion and future directions

In summary, data shows that most visitors to LSC have their phones with them (if allowed by authorities). This fact serves as a good foundation upon which a *SNSE*-facilitated learning environment could be

constructed. Yet during our studies we uncovered some factors that may account for varying uptake of *SNSE*. These factors have differential effects, but in particular, seem to be interfering with possible uptake of mobile phone-related services. Our analysis suggests that informal learning should be socially embedded in people's interaction behaviors and patterns of technology use, taking advantage of visitors' interest in sharing the content. It should take into consideration the symbolic significance and social interactive dimensions of a trip to a science center, capitalizing on the memory-making that individuals do through picture-taking.

As to future directions, multi-person involvement and game-like offerings would seem to hold promise. Such interaction should work to make the mobile phone interaction shared and inclusive, as opposed to the reverse. It would also be worthwhile exploring the possibility of developing conflict-narrative material, which would allow interaction and participation via mobiles. Having material that engages visitors with the physical space of the center via mobile phone contests or search activities could also prove to be a fruitful direction.

Greater consideration should be given to the physical limitations of mobile phone-based services

within the science center environment. Though these limitations are often intractable, they nonetheless remain an important area for design improvements as future developments are considered. Sound cancelling technology, for instance, holds much promise in this area.

But perhaps the most important question is: Why bother? Unless there is a reason to use the mobile, most people will not. Compared to the wild excitement that accompanied the introduction of the Motorola flip phones two decades ago, and the more recent enthusiasm that greeted Apple's iPhone, the novelty of the mobile phone itself has been severely diminished. Hence people will need some motivation to go to the effort to access content, interact with, or otherwise become involved with science center offerings and ideas. These motives usually come from the ability to gain resources, be entertained, or compete socially. We have suggested a few ways the exhibits could be structured to tap into these motives. Yet, that said, it is also important to consider the rapidly changing nature of communication technology, so investments need to be moderated in order to be flexibly and quickly upgraded.

In conclusion, the mobile phone is not the hoped-for panacea for science centers and museums, but

then neither was the video display, the computer, the Internet, or even television. Each of these has its place, and each remains in dynamic tension with the ever-changing demography and interests of museum visitors, as well as potential visitors. Museums and science centers are continually evolving towards greater sophistication in terms of both understanding of their visitors and the refinement of their exhibits. For their part, mobile technology and delivery platforms will also continue to advance and they, like other popular communication technologies before them, will surely find a place in the evolutionary trajectory of museums and science centers.

## Notes

1. Beale (2006) delineates up to eight forms of mobile technology interference, including the tension with privacy/security issues, interference from physical device characteristics, enhanced feelings of social inclusion/exclusion within a group, changed perceptions of trust and affordances, interactions between formal and informal learning, environmental awareness and attentional control, conflicting old and new skills, and different expectations for technology use among different generations.

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## CASE STUDIES



Musée d'Orsay, Paris

**The Mate Game at Re: generation  
Copernicus Science Centre  
Warsaw**

ANNA SCHÄFERS  
& JÖRG SCHMIDTSIEFEN  
*Archimedes, Berlin*

The new Copernicus Science Centre (CSC) in Warsaw contains a gallery for an – in Science Centre terms – extraordinary age group: 17 to 25 year olds. *Re: generation*, as the show planned, designed and produced by Archimedes is called, contains 80 interactive exhibits on subjects ranging from psychology and communication through social sciences to bionics, nanotechnology and space travel. Yes, there is lots of play here – create your own ringtone or drum rhythms from all over the world or find out if you're neurotic!

But an additional feature expands the perspective on play. *Mate Game* runs throughout the entire exhibition and links the exhibits. In a nutshell: after the first part of the exhibition, visitors are told that someone else with similar results has been there before them and that they can compare themselves to the other visitor for the rest of the exhibition. Messages and pictures are shown; the current visitor can also leave data for future Mates in the chain.

Before describing the game in more detail, let's take a look at what similar games have existed in museums before.

### Other games

In recent years, playing games in museums has

become popular – attracting new visitors, adding a new level of experience. In this section, we will discuss three games in museums located in Denmark and the USA.

*EGO-TRAP*: Inspiration for the CSC was the *EGO-TRAP* exhibition at the Experimentarium in Copenhagen. Here, after an initial log-in, visitors are led through a range of exhibits by their GPRS mobile phones. They are told by a pre-recorded female voice that scientists want to test them against lab rats. Visitors have to make predictions about their test results before playing; their performance is then rated against their guesses. In a second level, the visitors are paired with a partner and have to solve games at the next exhibits in cooperation. After a while, they are called by a new, male speaker who pretends he has hacked into the system and that the visitor should not trust the woman calling them. If the visitors trust the woman, the experience is over; if they trust the “hacker”, the game continues. The hacker dares the visitor to enter a room with a *No admittance* sign on it, the door slams shut behind the visitor. Security camera screens show images of the visitor in the exhibition, on a huge screen the female voice is revealed as belonging to a mutant rat who ran tests on the visitor. Only if the visitor wins a game against

the rat, are the doors opened again and the visitor set free. As the game gets easier after every failure, each visitor is eventually set free.

*EGO-TRAP* relies on visitors having a phone with a Danish number that has WAP/GPRS technology. While the visitor is paired with a real-life partner, the major interaction with the male and female voice on the phone is pre-recorded and thus identical for every visitor.

*International Spy Museum*: Visitors to the International Spy Museum in Washington, D.C., can become spies for the time they are on the premises. They adopt a cover and then roam the exhibitions to save a nuclear trigger from getting into the wrong hands. Safes have to be cracked, awkward questions by the other side (museum guards) evaded, messages need to be decoded.

This scavenger hunt is made interesting by interaction with real people. But this is also its disadvantage: when the exhibition is crowded, a visitor may go unnoticed and not be “interrogated” by the museum’s staff, thus taking away a large part of the excitement. Also, visitors are on their own in the mission, this is a single-player experience.

*Ghosts of a Chance*: In 2008, the Smithsonian American Art Museum hosted an Alternate Reality

Game (ARG) called *Ghosts of a Chance*. In the ARG's story, two young curators are haunted by ghosts in the museum, and the players have to save them.

The ARG community was baited by a (henna) tattooed bodybuilder crashing an ARG convention. The tattoos led to a website where gamers could start the interaction, sending in pictures first, later on artefacts to the museum itself. While involvement of the Smithsonian was assumed, gamers at first thought the institution too "serious" to be responsible. The ARG culminated in an on-site scavenger hunt at the Smithsonian, with gamers further away having aided in its preparation and being given the end of the story online.

*Ghosts of a Chance* had a relatively large number of participants and involved a lot of time from the organisers in the virtual as well as the real world. But it was a temporally fixed experience. There is a modular version that can be played only at the museum, but it lacks the ARG's "sense of narrative and real-time happenings",<sup>1</sup> and does not need staff.

The three examples described here show the potential of games in museums: action can take place onsite, outside the museum or in the virtual world. Interaction and communication can be direct or via digital tools like mobile phones. They can involve

staff, a well-equipped server and software, or both. They can address the museum's normal audience or try to gain access to a new community – probably the boldest move but potentially of only seasonal consequence.

Here is what Archimedes came up with.

#### Development of the Mate Game

An overall game was one of the obligatory elements in the tender documents for *Re: generation*, adding value for the target group with a playful layer. The game's aim is to connect the different exhibition parts, its subjects and the exhibits themselves. In the exhibition there are four large sections embracing wide subject areas: *Me* is about the visitors themselves, neurobiology, psychology etc.; *Me and You* talks about interpersonal communication and family roles; *Me-Us-Them* deals with ethnography, sociology, mass communication and politics; *Me-The World* focuses on understanding the world around us, bionics, nanotechnology, climate change, the universe.

While a clear concept for the design of exhibits and the exhibition architecture can tie such diverse subjects together, Archimedes believes that a metaphorical bracket pulling together content and the visitor's experience can help in seeing

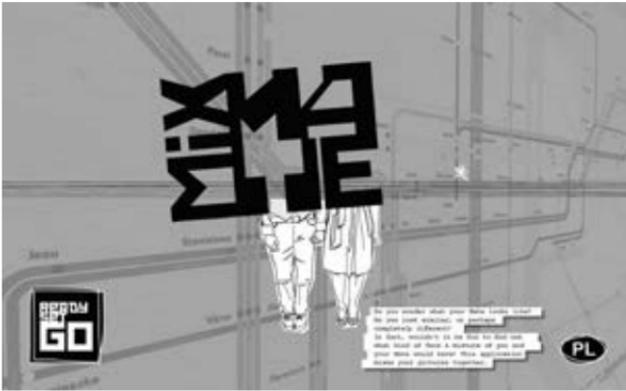


The first contact with the Mate Game.

*Re: generation as an entity.*

The first ideas to create an umbrella for the gallery included following a Thematic Path: a number of exhibits related to an overall theme had to be used; the visitor would then be awarded a “degree”. Having finished all the exhibits about psychology would earn you a “Master of Emotions”, having focused on marketing and communication would make you a “Communications Guru”. But this would only have connected some of the exhibits and visitors would have experienced the exhibition on their own. We wanted a more complex and more complete solution.

We decided to talk to the target group and have them come up with a game. Interface design students from the University of Applied Sciences Potsdam took



The start screen for the application *Mate Mix* within the *Mate Game*.

a semester to develop ideas for an overall game for *Re:generation*. In small groups, very diverse proposals evolved. One game had the visitors save a fictional world, *Solum Epos*, with the knowledge gained in the exhibits. Another made visitors first equip their own flat and building, then an entire Copernicus City, together with other visitors. These ideas were, as a first step, presented to and discussed with Archimedes and then, when they were further developed, referred to the CSC for evaluation. The CSC's verdict unanimously fell on the *Mate Game*. It involves a large number of the exhibits without forcing itself into the foreground, lets visitors get in touch with each other and is personalised for players without involving the science centre's staff.



In the first stage, the visitor takes a picture of herself.

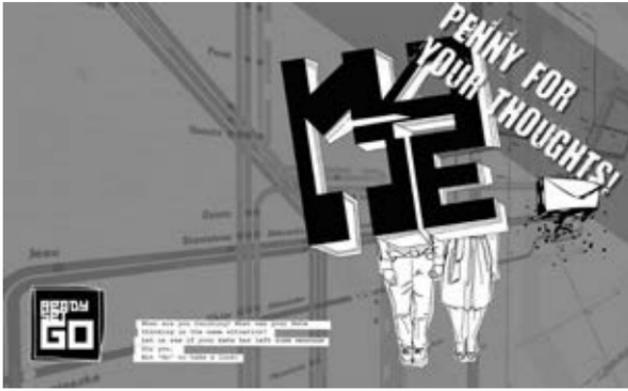
### The Mate Game

The *Mate Game* adds a social feature to the exhibition; while in the exhibition, it connects two visitors. It is enabled by the fact that most of the digital interactive exhibits only work when the visitors insert their RFID entry ticket, which allows for their identification and the storage of their results and behaviour. Every participating visitor will be assigned a Mate who has already left the gallery – this keeps the link more mysterious on the one hand and on the other hand helps shy visitors who wouldn't want to interact with a complete stranger. Once the current visitor has left the exhibition, they can become a Mate themselves for someone new – long chains of Mates are formed. The aim of the game is to follow the Mate's traces and to compare results.



Her image is then “mixed” with that of her Mate.

Before entering the exhibition, the visitor is made aware of there being an overall game by a large banner hanging at the entrance, but nothing more is revealed. The visitor’s play activity in the first part of the exhibition, where lots of exhibits deliver results (time needed for a game, pulse after stress, Big Five characteristics etc.), is used to compute a good match, a Mate, once the visitors enter the second part of the exhibition, which focuses on interpersonal communication. On inserting their ticket into an exhibit here, the visitor will be reminded that there is a game happening, that their data was saved and that they can participate. It is up to the visitor whether they want to participate or not. If they want to enter, they have to create an account with a nickname and a password which will be used for the online part



The start screen for the application *Penny for Your Thoughts*.

of the game. The game mechanisms are then explained to them: *Play with the exhibits! Look for the Mate Button – hit it!*

From then on, a large number of exhibits show a Mate button at the end of the main task. Using this button, the visitor will enter a submode of the exhibit where they get information about their Mate's achievement and participation in this specific exhibit. The form of these results varies. Some exhibits will show texts (personality categories, feedback): for example, in a personality test, the visitor is told that their character is closest to the sanguine/choleric/phlegmatic/melancholic type. On the Mate screen, the results of both the present visitor and their Mate will be shown next to each other with a marker if they are similar or



The Mate has left a message for the current visitor who can now leave their own message.

not. Other exhibits will compare a score (number of correct answers, time), while others will have images (a magazine cover, maps, photos).

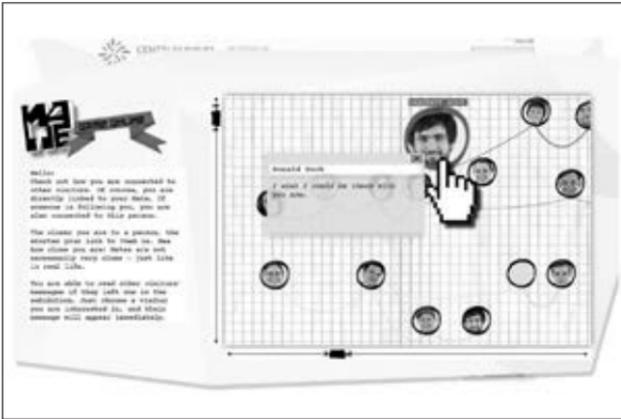
While the game is mostly about following and leaving traces, there are three extra stations for more direct communication between the two Mates. The first of these is the *Mate Mix*. Here, visitors are prompted to take a picture of their face with the camera integrated into the exhibit. In a digital version of *cadavre exquis*, their face is first cut up into small pieces, then mixed with that of their Mate. In order to do this, the application performs a database query for the Mate's picture not only from this exhibit but also from three earlier exhibits in *Re:generation* where visitors took photos. The idea is to give a very short

but playful impression of what the Mate could look like without giving away too much.

The Mate Mood Messenger, *Penny for Your Thoughts*, lets the visitors communicate directly with their Mate. This application is integrated into the exhibit on sociograms as connected to digital social networks like Facebook – there is a direct content link between the two applications. Upon accessing *Penny for Your Thoughts*, the visitor is shown a message their Mate left for them. They then have to choose the beginning to a message of their own: *I wish*, *I hope* or *I think*. Beginning thus, they can send a note to the next Mate in their chain, talking about their feelings and hopes for the future. The text is limited to 160 characters, brought to the touchscreen with an onscreen keyboard.

Let us take a short digression to the planning behind this. Originally, the Mate Mood Messenger was supposed to work with modules of given words, as in fridge poetry. In English with almost no flexion of words, this would have worked nicely. But as Polish declines both its nouns and adjectives, and conjugates its verbs, we had to fall back on free text input which could lead to less friendly messages than intended.

The final Mate station is also the last exhibit of the whole gallery. Here, the Mates'



In the online part of the game, visitors can see who followed them and what messages other Mates have left.

relationship culminates in a large projection of the experiences they shared in the gallery, all the Mate's pictures, their results, photo and message will be shown once more to end the game in style – this is where the visitor can see a complete picture of their Mate and finally know who it was accompanying them during their visit. As the exhibition setup has the end point right next to the start point and is thus in a prominent position, the projection doesn't stop when no one is logged in but shows random Mate messages, alerting newcomers to the game.

In addition to the onsite part of the *Mate Game*, visitors can also login to the CSC's website. Not only

can they have a look at all the data they produced in the exhibition, they can also track their Mate chains here. Who is the next in line? Who was there before them? They see pictures of all the Mates and can read their messages.

### Conclusion

To play the *Mate Game* at the Copernicus Science Centre, no other tool apart from the RFID ticket every visitor receives on entering the exhibition is needed – so it is inclusive to everyone on site. The interaction between Mates is an interaction between real people, there are no pre-recorded voices. But it is not reliant on staff, who might have to deal with too many visitors at once. Mates are members of the same group, they share experiences because of their group relationship, and also because of their visit to the same exhibition. This connection will make for a good experience for all players.

With the *Mate Game*, Archimedes has created an interactive, social game which both connects visitors and succeeds in making the *Re:generation* gallery – with its diverse subjects and themes – one global whole.

## Notes

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**Case Study**  
**National Museum of American  
History**

DANA ALLEN-GREIL  
*Ogilvy Public Relations Worldwide*  
Washington DC, USA



Figure 1: The Shorty Awards honor the best people and organizations on Twitter. One NMAH follower shares the reason behind her vote.

It started out as a way to cover live events during the National Museum of American History's (NMAH) November 2008 reopening weekend. Following a two-year renovation-related closure, we knew that the museum's fans were eager to see the doors reopen. Planned festivities included a dedication ceremony with then-President George W. Bush and a ribbon-cutting opening day celebration featuring General Colin Powell (Ret.). We wanted to provide a fan's-eye view of the celebration even for those who could only join us virtually. We looked to various social media outlets to accomplish this access, launching a new blog, Facebook page, Flickr group, and Twitter account.

Armed with a Blackberry, I tweeted play-by-play coverage of the events, saying things like: *Snow just*

*began to fall on the anxious crowd outside the museum. Just a few more minutes until the doors swing wide open!* Twitter gave us a way to reach not just the few dozen followers we had at the time but, via the magic of RSS, to also quickly update key pages of our Web site and blog without being chained to a computer. Those early tweets now serve as a fascinating archive of as-it-happened accounts.

What to tweet?

In those days we didn't know much about what a museum might use Twitter for. We promoted events (come to this!), the latest blog post (read that!), a recent news article about us (aren't we great?!). It was all very narcissistic. We tried having some fun by posting comments from visitors in the exhibition, things like: *Overheard from a man to his child in the Lemelson Hall of Invention: That's like Mr. Potato Head but he's Mr. Styrofoam Face.* Slowly we started to get questions from followers: *Why isn't the Stephen Colbert portrait on view?* – and we shifted to a more conversational style. *We know you've been waiting for it . . . and it opens on Friday! What is it?* (Answer: The ever-popular *First Ladies* exhibition.) The use of “we” – first on the blog and then on Twitter became more comfortable than our usual *The Museum*. We tried

posting fun facts: *The California gold rush drew wealth-seekers from around the world. More than a third came by sea.* <http://tr.im/mIQY> - but it was hard to remember to craft these on a regular basis.

*This day in history:* It wasn't until nearly a year later that we discovered HootSuite, a tool that let us both shorten our links and schedule tweets ahead of time. We posted: *Sandra Day O'Connor wore this robe on Sept. 25, 1981, when she was sworn in as the 1st woman on the U.S. Supreme Court.* <http://ow.ly/qj2q> and *September 28, 1918: Outbreak of flu in Phila., spurred by Liberty Loan parade. Learn about our flu vaccine collection:* <http://ow.ly/rpuh> Our *This Day in History* series was born. We standardized our format: *Today in 1962: Riots over desegregation of Ole Miss. This Confederate flag was flown during student demonstrations.* <http://ow.ly/rpK3> and tried to always incorporate a link to the collection if we could: *Today in 1908: Ford Model T introduced to the American public. 1913 and 1926 Model Ts on display:* <http://ow.ly/rq5U> & <http://ow.ly/rq6U>.

The series came with a built-in reminder to look for things to post – what happened today in history? And the soundbite style made them popular with followers to retweet, spreading our account name and links to our Web site farther and wider. We still post links to our blog, draw attention to news, and



Figure 2: Incorporating hashtags or usernames of Twitterers with high follower numbers can help make your tweet more viral. This *Hottest Tweets* report is from DailyRT.

pose open-ended questions but the *This Day in History* tweets are by far the most retweeted and responded to content we put out on Twitter. There are several other organizations that produce similar online resources on history that happened on specific days of the year. We take advantage of these (the *New York Times*, *History Channel*, and *Wikipedia* websites are great sources of inspiration for us) and try to make them unique by connecting them to what makes us special: our world-class collections and scholarship. We try to participate in daily memes (e.g. #museumfactmonday, #musicmonday, #woofwednesday, #thankfulthursday, #followfriday) and these are popular for RTs too.

*How often?* We currently send an average of ten

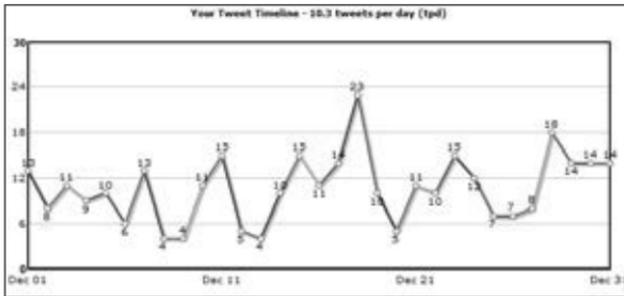


Figure 3: Tweets per day can be charted easily using TweetStats.

tweets per day – this includes *This Day in History* promotions, fore vents, @ replies to questions and comments from followers, and retweets. The frequency is lower on weekends and can go significantly higher on busy news days or when a good conversation is going amongst followers. (Fig. 18.3)

*To retweet or not to retweet?* Retweeting content posted by others can be tricky because you are less sure of the accuracy and quality of the information than you are about your own content. When retweets are sent from @amhistorymuseum, we focus mostly on other Smithsonian accounts and trusted peer institutions (e.g. National Archives, Library of Congress, etc.) We also retweet funny, favorable, and informational tweets from visitors – especially those that include a TwitPic or

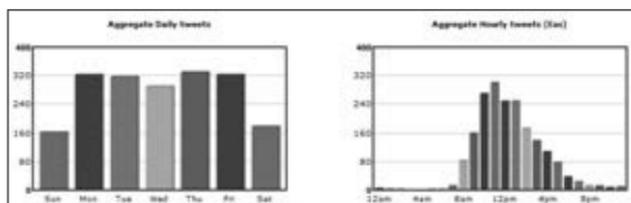


Figure 4: Daily and hourly tweet density charts from TweetStats.

a link to a blog post. It's smart to conduct a quick gut check of the person's past ten or so tweets (or a handful of blog posts if you're retweeting a link to one) to make sure the other content associated with that account isn't offensive or spam. Some museums wonder whether a retweet is seen as an endorsement - and in some ways it is. However, we assume that our followers understand that when we RT we're recommending that particular tweet and not necessarily everything coming from that Twitterer's account.

Spreading the message and gaining followers

*Getting retweeted:* Social media marketer Dan Zarrella published a free report on *The Science of Retweets* (<http://danzarrella.com/the-science-of-retweets-report.html>). He looked at the factors that make a message likely to go viral, including: how many followers the original and subsequent senders have,



Figure 5: Our very first tweet, a clever take on Samuel Morse's famous first telegraph message, sent over 150 years earlier, in 1844.

the content of the tweet (e.g. calls to action, links to blog posts, lists) and the time of day the original tweet is sent. He found that retweeted tweets (a tongue twister!) were more likely to contain a link than not and were sent during business day mornings (EST). NMAH has found that *This Day in History* tweets are more likely to be retweeted than our other tweets, so we try to send them during peak retweet hours and they almost always include a link. It helps to compose your tweet in less than 120 characters because a retweet will contain *RT* or *via*, plus a space and then your username (@amhistorymuseum is 16 characters). Keeping your tweet short just makes it easier for others to keep your original message intact without having to try to shorten it further. (Fig. 4)

*Targeted follower recruitment: Thanks for visiting!*

On a daily basis, we run a search for people who have tweeted any variation of our museum name (this search can be automated and results sent to you in a daily digest with services like TweetBeep and SocialOomph). We compile the usernames for anyone who references a visit to the museum and schedule a tweet to be sent late at night with the following message: @username1 @username2 *Thanks for visiting! What did you like most/least?* We can usually fit all of the usernames in one tweet (sometimes two) and we send it late at night so that most of our regular followers won't see it and be annoyed. The people who are @replied in the message will see the message in their list of mentions, so the time of day makes less of a difference for those users. With this strategy we've seen a very high level of response – and some fascinating comments (both positive and negative). In addition, it is our sneaky way of letting people who tweet about us know that we have a Twitter handle. It takes only a minute to put together this daily message and it helps our follower list grow by striking while visitors' minds are fresh from the visit.

*Who tweets?* Much debate rages about who within a museum should bear responsibility for tweeting. The marketing department? Curators? The tech

folks? In our case, it was the new media department who had the idea to launch a Twitter account, and so it has been that department's responsibility ever since. The original idea was for new media department staff (who manage web, online outreach, and digital interactive projects) to oversee the account, which would be accessed by contributing staffers from various departments including public affairs, visitor services, and public programs. (Fig. 5)

In theory, the @amhistorymuseum account should be a shared responsibility reflecting viewpoints from around the museum. It makes sense for the new media department to play an advisory role in social media efforts because the team is the most knowledgeable about online trends and effective communication across various mediums. But there is no reason – technical or otherwise – that creating interesting content and interacting with Twitter users should be solely the responsibility of that department. The museum uses HootSuite to manage its Twitter accounts, which should make collaboration by multiple staff a fairly straightforward process.

In reality, the account has been managed by one new media staffer. Other staff have access to the HootSuite login and have tweeted on occasion. The know-how is there (at least for some) but the sense

of responsibility is missing. What is the reason for this? In part the problem seems to be that it simply isn't thought about – if you don't tweet consistently, it simply doesn't occur to you to do it. In order to ensure that the museum's Twitter efforts are proactive and sustained, more staff will need to feel individually responsible on an ongoing basis. Whether this means assigning point people on certain days or asking staffers to be responsible for a given topic or area (e.g. visitor services would be responsible for responding to visit-related queries) all days remains to be seen.

*Content review:* Oversight of content put out on Twitter is generally more lax than it is for the museum's other online outreach efforts (e.g. monthly e-mail newsletter, blog posts). Most of the time, the museum's tweets are comprised of text and images already vetted for the website and creatively repurposed for Twitter. For newsy topics that aren't already represented on the site, the public affairs office is consulted (via a quick phone call or email) to make sure the tone is appropriate and facts are correct. On a few occasions a series of tweets on a given topic (e.g. Julia Child's kitchen facts) has been planned; in those cases the content has been crafted and then sent to curatorial units for fact-checking

prior to posting.

This laid-back approach to editorial review is unique to this platform. The museum's blog, for example, has a team of almost a dozen reviewers and a formally documented, structured process. The reason for this difference is unclear. It may simply be due to Twitter being off the radar for most museum staff and so it hasn't occurred to them to demand prior review. The expectation of the Twitter community for timely, up-to-the-minute information makes this review process (or lack thereof) favorable, so long as information is accurate.

*Managing mistakes:* No matter how diligent you are about spellcheck and other content quality control, you will make mistakes. On a handful of occasions, we've transposed numbers in our history dates, rendering our *This Day in History* fact incorrect... and usually hysterically so. While Twitter allows you to delete tweets, that doesn't necessarily mean that they disappear from the internet entirely. If you can, issue a correction. And don't forget to have a sense of humor. (Fig. 6)

To follow or not to follow?

In the beginning, NMAH only followed other Smithsonian accounts. There was some concern

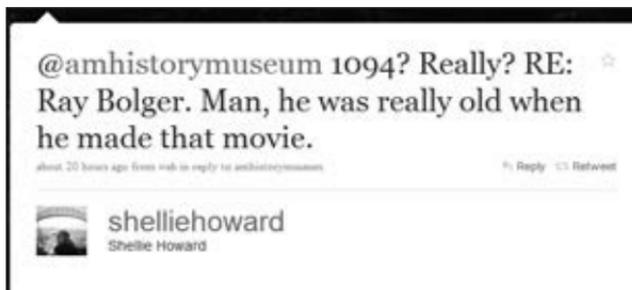


Figure 6: Managing mistakes.

about following a user looking like an endorsement – particularly because their Twitter image appears on your account’s main page. The museum doesn’t put corporate logos on our website and many Twitter images are essentially logos. Over time we added other history organizations and museums (nonprofit) and a few historians/academics.

*Pitching on Twitter:* During a summer promotion of Julia Child’s kitchen at the Smithsonian, we launched a blog series that featured staff members trying new recipes each week and asking readers to try them too. The promotion coincided with the release of the *Julie & Julia* film and we wanted to maximize the feedback we’d get from readers. There is a critical mass of foodies and food bloggers on Twitter who we thought might be able to help us spread the message, so we experimented with pitching Twitter accounts. First, we researched lists of food-related Twitter accounts – particularly those with a large network of their own followers – and began following them. Many Twitter users automatically follow back – at the least, they are notified of your follow and their interest may be piqued. This strategy was very effective for getting new followers interested in a specific topic. Once someone is following you, it is possible to send a direct message via Twitter

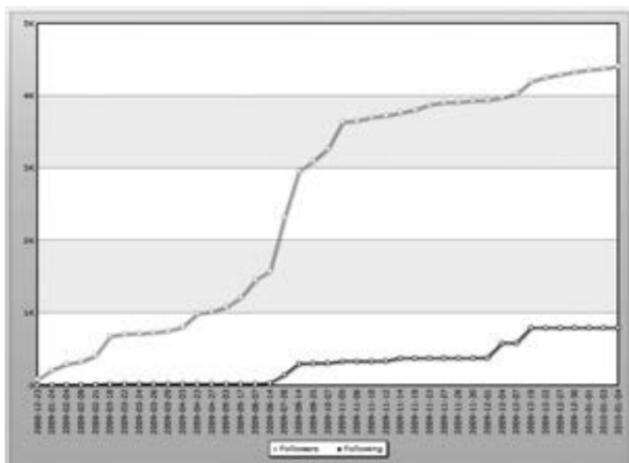


Figure 7: We began to follow other accounts more widely during the summer of 2009; the museum’s followers began to rise drastically around the same time.

for more private requests. We pitched a handful of Twitter users this way, sending direct messages with a request to inform their readers of our new weekly blog series about trying Julia Child’s recipes. This was met with some success. Now that the series is over and our concentrated focus on Julia Child promotions is over, the question remains whether these followers will stay on when the content is less focused on food; we also wonder whether we should unfollow this group, as foodies are disproportionately represented on our following list. (Fig. 7)

### Multiple accounts?

Every few months, the idea to create a new Twitter account (or Facebook page, etc.) comes up. Whether it's an exhibition team or a particular department, the concept is usually the same: wouldn't it be better to have an account that sends highly-focused tweets on a particular topic? Wouldn't we then be better able to target specific audiences? The answer to the second question is probably yes. Whether or not this is a better strategy is a different story.

The museum's main Twitter account now has over 5,000 followers and it took quite some time to build that level of following. Will we see more of a response by sending jazz-related tweets from this main account during *Jazz Appreciation Month* (April) or by creating a new account that tweets only about the topic of jazz? Certainly there is a large enough audience of jazz lovers to justify a separate account. A more important question, however, is: who is going to maintain this account? And will they be able to sustain it?

We see social media as an opportunity for us to create long-lasting relationships with people. So our current thinking is that it is not a good placement of efforts to create an account that will be highly active for a month or so and then go dormant.

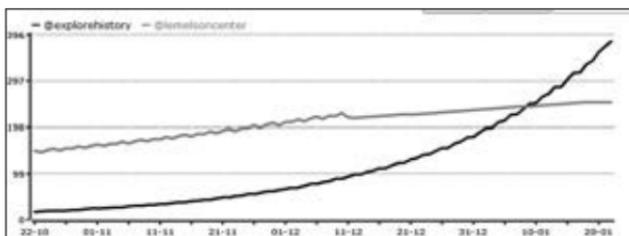


Figure 8: Follower growth for @explorehistory and @lemelsoncenter accounts. Chart from TwitterCounter.



Figure 9: The HootSuite Web site (and iPhone app) allows you to easily manage multiple Twitter and other social network accounts. It offers link shortening, photo uploads, link click stats, and scheduling features. In addition, it incorporates Twitter list and keyword search functionality, allowing you to create customized columns that filter the Twitter streams you follow into useful categories.

So far there have only been two cases that seemed to justify separate accounts. An @explorehistory handle was created for outreach specifically to an educator audience. The team of staff responsible for producing the Smithsonian's *History Explorer* website (<http://historyexplorer.americanhistory.si.edu>) has taken on the responsibility of creating content and interacting with teachers in a sustained and ongoing way. Similarly, the *Lemelson Center for the Study of Invention and Innovation* already has in place a focused

and ongoing program of activities that attracts a particular audience. The @lemelsoncenter account tweets about events in patent and invention history and links to invention and creativity-related news. The @explorehistory tweets more regularly (at least one tweet a day) and its exponential growth (Figs. 8 and 9) is probably related to this sustained effort.

How to measure success?

The National Museum of American History follows the evaluation plan steps outlined in the *Measuring, Analyzing and Reporting* chapter of this book. A sample dashboard report (Figs. 10a, 10b) is included here for December 2009.

Activity genre	Metrics	Actions
<p><b>Influence</b> (Awareness, message amplification, reach)</p>	<p>New followers this month: 390 (10% increase). Clicks: 9062 (72% increase). Goal: Increase followers to 10,000 by June 30, 2010.</p>	<p>Promote Twitter feed more prominently on Web site, email signatures, and in the museum.</p>
<p><b>Engagement</b> (Conversation, interaction, participation)</p>	<p>Conversation ratio (mentions:tweets sent) (202:329): 1:0.6 Visits to blog: 123 (ow.ly + Twitter.com) (56% increase) Goal: Increase average conversation ratio to 1:1 by June 30, 2010.</p>	<p>Ask more questions. Specifically, solicit responses related to <i>Stories of freedom and justice</i> theme for 2010.</p>
<p><b>Relationships</b> (Loyalty, satisfaction)</p>	<p>Lists: 482 Satisfaction score: 96% (5 negative mentions) Goal: Maintain high satisfaction score (90% or better).</p>	<p>Respond to negative mentions promptly and transparently.</p>
<p><b>Effort</b> (Time spent, resources applied)</p>	<p>Average tweets per day: 10 (Up from 7 in Nov.) Time spent: 3 FTE hours per week. Goal: Distribute responsibility for content creation and relationship building across the Museum.</p>	<p>Train additional Museum staff to send updates, monitor responses, and reply to follower questions and comments.</p>

Figure 10a: Sample dashboard: activities.

**Influence: top clicked links**

- We're looking for an intern for spring 2010 to work on online educational activities. Find out more: <http://ow.ly/HExW> (235 clicks)
- Books make fabulous gifts for children. Find 200+ suggested historical fiction and nonfiction titles, all reading levels: <http://ow.ly/HezQ> (172 clicks)
- Today in 1792: George Washington re-elected president and John Adams re-elected vice president. <http://ow.ly/lDPY> <http://ow.ly/lDQg> (167 clicks)

**Engagement: most retweeted**

- Happy birthday, Iowa! Today in 1846: The Hawkeye State became the 29th to be admitted to the Union.
- Today in 1776: Gen. George Washington's troops cross the Delaware River for a surprise attack. <http://ow.ly/PiKE>
- Today in 1904: The first New Year's Eve celebration is held in Times Square (then known as Longacre Square). <http://ow.ly/Qu0N>

**Relationships: selected @ replies: negative**

- @joshgans: @amhistorymuseum I would have liked to have been able to teach my kids more about American history there. It was a bit random and sound bity

**Relationships: selected @ replies: positive**

- @Mr\_Lincoln: @amhistorymuseum The museum is simply the best in the United States. I love it there. I love your Lincoln exhibit, too.
- @PatMaloney: @racheldiane Smithsonian is better than most museums. They still display artifacts of great Americans! Ought to follow @amhistorymuseum
- @cdilly: Makes me want to spend NYE at the #museum: RT @amhistorymuseum New on our blog: Slideshow: 2009 year in review <http://ow.ly/16fff6>

Figure 10b: Sample dashboard: content highlights.

# **Click History: Wherever, Whenever**

KATHLEEN HULSER  
*New-York Historical Society*

STEVE BULL  
*Cutlass Inc*

How do you engage new audiences both inside museum walls and out in the cityscape with museum objects, library writings, paintings, and long-dead personalities? Cellphone tours and iTunesU content from a collaboration of the New-York Historical Society and Cutlass give some answers in a technological key. They include a glimpse of a Haitian grave robbed in Lower Manhattan to supply a saint for an uptown cathedral, and a teen rapping about the Kansas-Nebraska Act. Hulser and Bull have discovered that gaming Miss Grundy or a GPS *Where's Waldo?* may be the route to having history come alive in the devices that young hands best love to hold.

Museums realize that their holdings ought to be seen inserted into their original contexts and cityscapes. They also reluctantly recognize that many new audiences find words like *historical society* about as welcome as *dental surgery*. However, a game of discovery of the mysteries of the past in familiar cityscapes is a game that young and old love to play.

Museums in general own a plethora of objects that no one ever sees, and could never conceivably be presented in real exhibitions. However, as we well know, web appetites are truly gargantuan, and handheld devices actually work at a scale precisely that of many tiny, precious, rarely known objects. So



John Brown's Body Song by Fletcher Webster's Regiment. Civil War Songbook. Nov. 24, 1862. GLC00968. [Courtesy of Gilder-Lehrman Collection]

the group of images, which correspond to a grave just spied through a crack in the fence of St. Patrick's Old Cathedral, are the small family portraits of "almost saint" Pierre Toussaint. The originals painted on ivory are only a little over three inches high. Thus on an iPod, iPhone, or similar smart phone found with every young adult, you are seeing them at actual scale in the palm of your hand.

So while delighting curators by giving material culture a boost, we also intrigue the itchy finger public that must do something with their phones. Museums ought to be more than pleased that their long-term agenda of restoring context to objects is happening in such an unanticipated fashion. This internal museum agenda happily dovetails with the participatory urges of device users, who enjoy browsing for its own sake. The cellphone public thinks in terms of vignettes rather than large scale exhibitions. They often have more experience and love of collecting and collectibles than reverence for the treasures of the museum mentality. The words *search, find, sort, tag, save* may hold at least as much relevance as *learn, emulate, revere, and inspire*, although both may be active impulses at different times in the same user.

Meanwhile, the small device, and its parent, the



African Free School. Patrick Reason. Records of the New York Manumission Society. [New-York Historical Society Library]

computer, have radically revised assumptions about viewer attention. Although the customary museum wisdom has too long been a great sob that young people have short attention spans, few museums seem to be absorbing the fact that the museum visit now includes experiences that are before, during, and after an actual bodily walk-through in the museum. Our N-YHS iTunesU site has had 10,000 tracks of one walking tour downloaded in a year – an indication that we are only on the threshold of a huge wave of virtual use of various digital packages. So, at the New-York Historical Society, a young black man might

be thrilled to learn about *Slavery in New York*, or he might dial a cellphone tour that tells him about spots where fugitive slaves sheltered during the 1850s in Tribeca. Or a Latina student at the Borough of Manhattan Community College might be contemplating a sign on Chambers Street, noting that Frederick Douglass landed there before launching a big anti-slavery career.

These before-, during-, and after-visit experiences encourage the museum to handle its materials differently. At N-YHS we have explored the story of black political activist Dr. James McCune Smith from many angles. He was a star graduate of the African Free School. The N-YHS has the African Free School's records and can place his activity in the context of early segregated schools, which were cradles of black political thought and also a symbol of early Jim Crow in the North. We can suggest Underground Railroad activities in his pharmacy at 55 West Broadway with apothecary jars from our collection; this time the containers are not just pieces of material culture, but metaphorically signal remedies for injustice. The branching possibilities of media, the linkages between a cellphone tour and digitized collections, and full-fledged exhibition websites mean that both clickers and listeners have great latitude in exploring the story.

Once museum people begin to think of encounters with the collections as something happening in an unrestricted time and space – mobile devices, computers, and social media add up to the kind of visit extensions that should make audience evaluators drool.

Consider the following three scenarios:

1. A family with child in stroller strategizes about how they can enjoy some history without sparking too much protest from the youngest member by stopping. The solution is the peripatetic history experience, which allows mom and dad to keep in motion with a hand on the stroller bar, ear buds in, and an eyeball on images flowing on iPhone.
2. Another modern entrée into the historic cityscapes of a place saturated with history is the cellphone tour, which offers rare images of what once was, cued to a walk around neighborhoods that look different now. *Hidden Sites of Slavery and Freedom* did precisely this, animating a walk by old warehouses and trendy restaurants in Tribeca, while talking of how black political thought was born in those very streets.
3. GPS technology now allows for prompts, so

the historically minded can have themselves pinged to alert when passing by the very spot where David Ruggles ran a freedom reading room, which Underground Railroad activists used to get information on slave catchers and fugitives.

These shifts in visitor experiences and encounters with collections have many implications for 200-year-old institutions like the New-York Historical Society.

At a very practical level, it means that N-YHS has an incentive to photograph and digitize many items which might not otherwise be excavated for anyone's use. Usually, the N-YHS will photograph very important and valuable items, objects used in exhibitions, and objects requested by scholars or publications. That leaves the bulk of our collections without images, even non-professional reference photographs. Now that online demands are being made, justification for photography is there, and the rationales for photographing items have changed. So, we have extracted samples from anti-slavery pamphlets or abolitionist song books, and sketches in letters.

Our experience in recent years is revising scholarly assumptions about short form knowledge.

Scholarship, and the traditional museum which functions as the art-historical branch of such scholarship, have emphasized long-form knowledge. Meanwhile, the icon fluency of the web has garnered credibility for cognitive theories that view knowledge as an accretion of small bits. Mobile devices and social media play to our fascination and impulse-driven appetites for short-form knowledge, which is extending museum experiences into before-and-after explorations, side paths, collaborations, virtual collecting, gaming, and urban exploring. Size no longer matters.

Our audiences are teaching us the pleasures of the collections by creating new things out of old, drawing on their fresh sensibilities. For example, a summer high school intern group created a teen tour of the exhibition *Lincoln in New York*.<sup>1</sup>

We feel sure that the chanted history poem created by Tonie McKenzie and Omosede Eholor is the only existing female rap on the consequences of the Kansas-Nebraska Act.<sup>2</sup>

Everyone these days talks about doing something with collections: we stand in awe of what these two groups – all under age 17 – actually did with ours. Further changes in our authoring template are under way to ensure that the choices of curators of the past

will resonate with the audiences of tomorrow. We welcome the way electronics allow people to play in the collections, and trust good history will emerge in many forms.

These examples suggest that new media is changing the clock on the museum history experience by motivating people to sample the fare before and after, not just during a visit. They allow users to encounter historical things virtually on their own schedule, in small and large doses. As social media enables more participation, the future of history through technology will involve the increasing collaboration of users yet to be known.

### **Notes**

1. Listen at: [http://touchtonetours.com/audio/LINCOLN\\_112.wav](http://touchtonetours.com/audio/LINCOLN_112.wav)
2. Tune in at: <http://touchtonetours.com/audio/rap.wav>.

**Placing Our Bets:  
Building a National Museum's  
Media Strategy From Scratch**

COREY TIMPSON

*Canadian Museum for Human Rights  
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Most mobile and social media discourse tends to provide insights gleaned from both successful and failed projects. Methodologies elaborated, bright ideas concretized, projects built on new or borrowed ideas and evolved, tried, and tested. Otherwise, the discourse focuses on imagination and grand designs – commentary, opinions, and extrapolations of what could be. This chapter has a slightly different focus, for both the tested and imagined have something in common. They assume an existence of some kind, a base to build from, a foundation. What does one do, however, when the Museum for which they work has yet to be built? When there is no collection? No technical infrastructure, no media policies? When there is barely even any staff? How does an institution consider its mobile and social media strategy and even begin to build global visitor engagement when starting from an empty, blank slate? Where to begin? And how?

The Canadian Museum for Human Rights (CMHR) is Canada's first national museum to be established since 1967 and is the first to be located outside of Canada's National Capital Region of Ottawa. Currently being constructed in Winnipeg, Manitoba, the Museum will reside at the historic Forks where the Red and Assiniboine rivers meet,

and where people have gathered for thousands of years.<sup>1</sup> With construction scheduled for completion in 2012, the CMHR is busy designing its programs, amassing its content, and developing its practices and policies. The Canadian Museum for Human Rights is mandated to explore the subject of human rights, with special but not exclusive reference to Canada, in order to enhance the public's understanding of human rights, to promote respect for others, and to encourage reflection and dialogue.<sup>2</sup> It will have over 47,000 square feet of exhibition space, a 20-storey glass tower, house a global reference center, and have extensive museum programs.

### Interactivity

The Canadian Museum for Human Rights' subject matter, human rights, is not only largely intangible, its accepted definition and application are continuously evolving. Considering such, the museum has often been described as an *idea museum* in that its focus is not based on a museum collection.<sup>3</sup> Its focus is based on the concept of human rights. Internally and among colleagues, the term *dialogue museum* has also been adopted. Referencing the last portion of the Museum's mandate, and thinking towards some relatively obscure museum design

discourse (see Neil Postman, “Museum as Dialogue,” *Museum News*, September/October 1990, p.58), the concept of dialogue has very interesting implications when considering the interaction design approach of the CMHR towards exhibition, web, and overall programming goals.

When designing museum programs to be *interactive*, a specific understanding of the term interactive has been preferred in an effort to convey far greater meaning and consequence than might be understood from acts as simple as pressing buttons on a touch screen. Considering the notion that the most interactive experience one might have in life is a great conversation,<sup>4</sup> designs for developing interactive experiences around a subject matter as impassioned as human rights lean perfectly toward establishing a reciprocal relationship between the museum and the visitor; a relationship where the museum informs the visitor, but where the visitor also informs the museum – hence the dialogue created. If the experience visitors might have in a gallery was expressed as a mathematical formula, then the visitors themselves would be one variable in the formula that defines their experience. Thus, in determining a definition of *interactive* as it pertains to the CMHR’s experience design, the reciprocal

relationship or action is mandatory. Anything else, such as pushing buttons to access video, audio, or to reveal text, is an expression of passivity.

With sessions in 19 cities across the country, speaking with and listening to thousands of Canadians, one of the Museum's first actions was to begin the dialogue. What are human rights? What do they mean? What are people's expectations from this new national institution? These topics and many more were addressed in 2009 and 2010 by the Canadian Museum for Human Rights Content Advisory Committee and the many Canadians who came to share and interact in these public engagement sessions. This approach of dialogue with the public continued through 2011 with a variety of other session types, less general in nature – intimate, public, academic, focused, and more. When considering the Museum's programming and presence before and after opening, as well as social media, mobile media, and new technology, the opportunity for continued dialogue is obvious. Social media and mobile technology are great facilitators of this dialogue. The CMHR can relieve physical and geographical constraints by exploiting what social and mobile media are offering – an easy way to engage conversation and foster dialogue no matter where

people are, and at their convenience. Through this interactivity, the Museum will inform more visitors, and more visitors will inform the Museum.

### The web

A generally accepted approach to considering the Internet in the design of the museum experience comprises the pre-during-post scenario. This scenario can be described in three steps: First, the visitor interacts with the museum digitally (via the web) before arriving – this is *pre*. Secondly, the visitor visits the museum – this is *during*. Finally, the visitor who has left the museum returns online, potentially following up on what they saw in the museum – this is *post*. The pre-during-post approach has proven very popular in museum practice, yet analysis reveals success to be somewhat unclear. The *post* aspect of the scenario has, in particular, been very difficult to prove successful unless facilitated, such as with educational programming.<sup>5</sup>

Considering the goals of the Museum to foster and encourage dialogue and, in effect, to be interactive, in addressing the use of the Internet or the web at the Canadian Museum for Human Rights an alternate approach to the pre-during-post scenario has been preferred.

In an effort to understand the strategy that would be adopted, the concept of Web 2.0 was examined. Web 2.0 is a term that was coined by Tim O'Reilly when O'Reilly Media and MediaLive held a conference in 2004 simply titled *Web 2.0*.<sup>6</sup> This term has reached mass adoption and is generally used by most individuals and institutions to express the accommodation of user collaboration, personalization, and information exchange via the web.

Software versioning is the practice by which a number or name is given to a product release. New numbers or names are used to designate new developments in software or hardware.<sup>7</sup> As such, if there is a Web 2.0, by definition there must have been a Web 1.0. What is the difference between the two versions? Is a Web 3.0 lurking in the not-too-distant future that the CMHR should plan for? To determine the answers to these questions, and to understand the significance of Web 2.0, Web 1.0 – the web prior to 2004 – must be defined.

Gopher sites predated early websites but both Gopher and websites prior to 2004 involved the publication of information by individuals and organizations and the consumption of information by other individuals and organizations. Anyone was free

to publish information, they simply had to know the protocol and have the right tools. The early Internet was also the first popular method of addressing the long tail of information – specific topics, difficult to find through popular means because of their lack of a critical mass audience, published grassroots-style to small audiences of seekers.

Another popular use of Web 1.0 would have been e-mail. In fact, electronic communication predates the Internet going as far back as the late 1960s.<sup>8</sup> Prior to 2004 users were able to communicate electronically with one another for little cost or hassle. Multimedia was also published and consumed by people via the web prior to 2004: images in the form of ASCII art, later GIFs or JPEGs, audio in the form of MIDI files, and animation made possible by the animated GIF, Shockwave, and even early versions of Flash. Media types, other than text, were published to the early Internet, or Web 1.0, and people consumed them.

When examining Web 1.0, the web before 2004, it is clear that collaborative communication was taking place via e-mail. It is also clear that users were publishing content and other users were consuming it. It is clear that this content being published included subject matter that would have otherwise been difficult to access. And finally, that this content,

while primarily in text form, also included a variety of media of various visual and auditory forms.

Post-2004 in the Web 2.0 world people are now e-mailing, MMSing, and instant messaging via the web. They are consuming Flash and Silverlight media, HD videos, 3D, and surround sound via the web. They are self-publishing via Facebook, Blogger, Twitter, and other social media. And people are personalizing with CSS, widgets, and social media.

When comparing Web 1.0 to Web 2.0, it is difficult to see the version change. Prior to 2004, people were using the web to collaborate, communicate, self-publish, access information, they were personalizing and consuming media. And post-2004 people are doing the same things. What has changed between then and now? Between Web 1.0 and Web 2.0? What happened in 2004? Other than the O'Reilly conference and the birth of a new slogan, not very much. People have always communicated, be it by carrier pigeon, letters via the postal service, e-mail, or instant message. Information has been stored, be it on scrolls, in books in library stacks, on microfiche, or on Gopher or websites on servers. The more information that is published and collected, the more difficult it is to find what one is looking for, so information has been organized. Be it by alphabet, by Dewey Decimal, by

ISO standards like Dublin Core, or by social tagging. And people have published and consumed media, be it ASCII art and MIDI files, animated GIF, Flash, or HD-HTML5-3D-video. Prior to and since 2004, the activities are all the same: communication and being social, publishing and consuming information, organizing information, and being entertained.

In 2004 there was no new version release. There was no new web. Nothing happened that drastically changed the environment and people's behaviors. When taking two arbitrary points on an inclination, say point A as 1998, and comparing it to point B of 2004, the two points appear drastically different. While a great method to illustrate rate of change, this comparison ignores the fact that there has been constant, incremental change. Rather than a fundamental change or version in 2004, there has been an incremental and progressive evolution in technology and methodology over time that has facilitated what people were already doing. Technology and methodology evolve to better meet the expectations of users, and as this happens, the expectations of users increase, demanding more from the technology and methodology that are serving them. This is a constant cycle of progression and evolution.

What comes next and how to address it in establishing a strategy for social and mobile media means considering the Internet for what it is at its core: a network that provides communication and access to information. In addition, understanding the web as a domain of continuous evolution has been key in strategizing the Canadian Museum for Human Rights' future social and mobile media applications, and, in fact, its use of the web overall.

### Ubiquity

In recognition of the constant evolution of the domain, and in anticipation that continued evolution will mean making more convenient the needs, practices, and behaviors that exist at present and have existed, the Canadian Museum for Human Rights is planning for absolute ubiquity.

The expectations of today's users are high. They are demanding and often impatient or unforgiving. In planning for a few years from the present, certain considerations have been highlighted. Youth, often considered early adopters of future popular trends (even if they proceed cautiously),<sup>9</sup> consume 11 linear hours of media per day, which is broken down as 7.5 hours spent multitasking, consuming more than one source at a time.<sup>10</sup> In the United States, the average

person consumes 3.6 zettabytes (or the equivalency of approximately 5.1 trillion hard drives) worth of data per day.<sup>11</sup> Consider that 75% of teens have mobile phones yet decreasingly make phone calls.<sup>12</sup> Also consider that, in the autumn of 2009, Denmark and Finland both declared broadband a legal right, or that there has been a progression in a relatively short time from the modem, to cable, to WiFi, and now to 4G MiFi and personal mobile hotspots. Access to information and the ability to communicate have become completely mobile and on-demand. Technology has become less visible through not only smaller devices but through blended technology such as the Social Media Garment by Electricfoxy that allows users to interact with social media sites through gesture,<sup>13</sup> or convergent technologies like eye-tracking, augmented reality, and social media brought together in Nokia's Mixed Reality Glasses.<sup>14</sup> Advances such as these that both respond to and encourage changes in expectations, that facilitate access to information and communication, must be considered and anticipated.

These current expressions of new blended technology and methodology among many others, and the understanding of the continued and constant evolution of the domain, provide insight helping to

inform the CMHR's strategies for social and mobile media. There are innumerable other considerations that can be illustrated but the point is that the web, through constant incremental evolution, has been democratized to a point where certain behaviors and expectations are no longer those of the few, or growing minority, they are now and will be expectations and behaviors of the vast majority. These expectations call for support towards multi-tasked, on-demand service via a multitude of devices – whenever, wherever, however, thus the Museum's strategy for ubiquity.

#### An emerging strategy

In consideration of all the aforementioned insights and more, the approach from the CMHR will be to bring the web experience into the Museum itself and encourage multitasking for those who expect it, when and where appropriate. The strategy of the CMHR is to make the delineations of the pre-during-post museum web interaction scenario less easy to define; to encourage interactions between the Museum and visitors, visitors and visitors, and visitor types irrespective of time and place versus activity type. The Canadian Museum for Human Rights will not focus on the pre-during-post web scenario but rather on ubiquity and the consistent opportunity for

access and interaction, using mobile and social media to facilitate these interactions.

### Getting there

In order to build towards the goal of ubiquity, the Canadian Museum for Human Rights must start somewhere. This starting point is the data. Planning for ubiquity means acknowledging that the popular technology of today will be replaced with the technology of tomorrow. Not only is this an expectation, this is a key variable in the CMHR planning strategy. Building a data architecture that ensures the proper cataloging, preservation, administration, and delivery of data, according to standards is fundamental. Scalability, interoperability, and true efficiency are the main goals of the Museum's data architecture along with the principle of "store once, reference often". If the Museum can build its data architecture knowing that data only has to be created and stored once, then no matter what technology or device becomes popular later, the content will not need to be recreated, only the delivery protocol will require addressing. And even then, only if subject to a new delivery standard.

Stored once, data is then pushed or pulled from the store to whatever device requests it. Context

is held or delivered separately. The device then contextualizes the fed content as appropriate. A clear and strict separation between content and presentation is crucial. This will enable the changing of the device without affecting the content, and or the editing of the content (or addition and growth of the content) without the need to change the presentation or the end device. This is the very high-level basis for the CMHR's data architecture. Accepting Museum data, user-created data, partner or shared data, and media of all kinds and from all origins, such a basic approach will set the foundation for efficient flexibility. Effort can then be spent on actually dialoguing or interacting with the audience through their preferred means no matter how these means evolve.

### Imagine

Imagine a photo of a hungry child sitting against a stone wall and the accompanying text describing the *Right to Food*. The photo and text exist in the CMHR data structure and could simultaneously be viewed by any of the following scenarios, each occasion wrapped in the appropriate context (including sizing the photo, abbreviating the text, etc.):

- two visitors discuss the image as it appears

on a digital kiosk in the gallery space next to a series of moral questions;

- a researcher sitting at her desk using the Archive Library Collection Management (ALM) system digitally shares a reference of the image and all associated metadata with a colleague as they co-author a paper;
- a university student visiting the museum reference center prints out the image in high resolution along with the list of where it has been used and all user related comments;
- someone sitting in his home rates this photo from the CMHR website's media gallery;
- a person using his smartphone sitting in a piazza across the globe views the photo against its original backdrop via augmented reality;
- a student adding music to images via a collaborative web project hosted by Amnesty International includes this image in her slide show;
- a teacher projects the photo to the class as part of a digital learning resource;
- a teenager logs in to Facebook and sees the image featured in ArtShare, *likes* it, and the image and associated info are delivered to the

- Facebook pages of this person's *friends*;  
• a student tagging a collection of photos on Flickr Commons from their tablet makes this photo part of her personal Flickr group.

An infinite amount of uses could be described that all involve the use of this one image and its accompanying text and data as part of a visitor's social interaction with both the Museum and with other visitors. Over time, as the domain evolves incrementally, the CMHR in its desire to meet the expectations of its audience, will have to evolve as well. Without the appropriate architecture, the Museum would not be able to offer these opportunities in an efficient way.

The Canadian Museum for Human Rights is only just beginning to operate. The building is being constructed, exhibition and museum program designs are underway, staff is being hired, processes and procedures established, and many infrastructures architected. The canvas is clean. This is a unique opportunity for those involved in the Museum's creation and growth, and the foundations are being set. The dialogue between the Museum and its audience has begun. If established properly, both in methodology and structure, the Museum's continued opportunity for dialogue and interaction will result

in an ongoing reciprocal relationship where the museum informs its visitors, and its visitors inform the museum. Social and mobile media can be great facilitators of this interactivity. They will be used by the CMHR in a way that strategically addresses the evolution of behavior and expectations, matching the nature of the web domain itself.

## Notes

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4. Nathan Shedroff, *Experience Design* (2001).
5. Filippini-Fantoni, Silvia; Bowen, Jonathan; *Bookmarking in Museums: Extending the Museum Experience Beyond the Visit?*, *Archives and Museum Informatics: Museums and the Web* (2007)  
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6. Richardson, Jim; *Co-Producing the Museum, Sumo* (2009) <http://www.museummarketing.co.uk/2009/12/07/co-producing-the-museum/>
7. <http://oreilly.com/web2/archive/what-is-web-20.html>.
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Media and Young Adults, Pew (February 2010).

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13. <http://www.electricfoxy.com/ping/>.

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# **Smartphone Interaction: The Museum as a Gaming Board**

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The Museum of Natural History and Archaeology (MNHA), in Trondheim, is the university museum at the Norwegian University of Science and Technology (NTNU). Being part of the university gives the museum access to student projects that enables us to test ideas and get technology tailored to our needs with limited personnel and economic resources. Working with students challenges the intuitions way of thinking and brings in new methods of developing technology and content.

During autumn 2010, a student group of programmers and product designers developed a smartphone application in cooperation with the museum. The group decided to make a game that would turn the museum's main building into a gaming board where your smartphone would be the centre of the game and the instrument that would take you through the different levels (Fig. 1). This was based on feedback from the project focus group, and a wish from the museum to find a way to combine space, social interaction, technology, entertainment and learning without making a digital guide

The smartphone was chosen as medium for the game because it provides an intuitive and known platform, saving the museum from investing in both expensive equipment and maintenance costs.

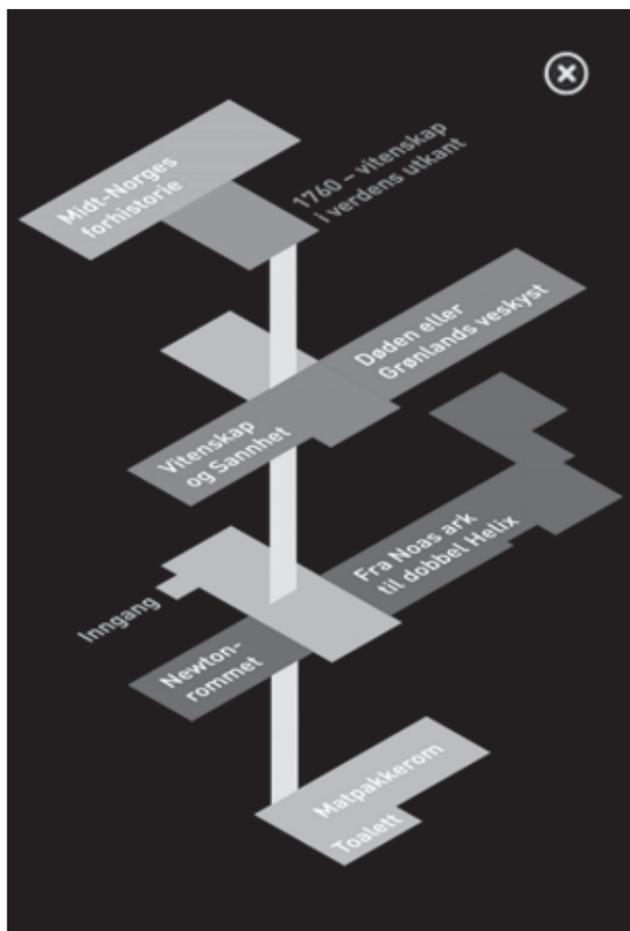


Figure 1: Exhibitions as levels of the game.

The obvious downside is that it excludes parts of the audience, so we lent iPods to our visitors. The first version of the game will only be available for iOS4, leading, after testing, to a new version that can be

used with other operating systems.

In this chapter, I will explain our thinking behind the game, rather than a scientific approach to gaming in the museum. Screenshots are from an early phase of development and will differ slightly from the final product.

### Target group

The smartphone game is aimed at family groups with kids at the age of 6-10 coming to the museum with parents or grandparents. The target group is our main group of visitors at weekends and holidays and the game is an answer to a need for more activities and interaction in the museum, gathered via audience feedback and from educators at the museum.

### Theoretical background

The game is based on a few basic learning theories. The general theoretical background is the constructivist museum as described by Hein (Hein, 2002) where we aim to let visitors decide their own sequel of information and experiences, and where they make connections with known concepts or references.

### Storyline

The story of the game is that five signature objects

from the museum's collections have gone missing. You need to assemble a team of friends or family to help the museum get them back. To do this you must solve three puzzles in each of the six exhibitions - each exhibition is considered a level as used in traditional digital gaming. By passing a level you retrieve one of the missing objects. You do not need to pass one level to move to the next one, so that you can move in and out of the levels as you like until you have finished all the tasks. You can make your own route through the museum, and you can be tactical about the order in which you want to perform the tasks. There is no physical beginning or endpoint to the game.

There are four types of puzzles in the game (Figs. 2-5). One uses the phone's camera and QR-codes. Eight codes are hidden in each exhibition and you have to find five right codes to solve it. The other tasks are True or false, Place things in order and Drag a line between a picture and an answer. The mix of puzzles will vary in each exhibition to make the game less static for the players, and to allow us to vary the game with limited recourses.

When you have collected six items, you receive a message in which the museum congratulates you for helping find the objects. For now the game ends here. There is a 30-minute time limit to the game, set in



Figure 2: The task is to find objects by solving puzzles.

order to give the gamers an idea of how much time they will need to spend on it.

You have to be physically present at the museum as the building is the game board. The gaming

experience is likely to prolong the memory of the visit, challenging the traditional preconception of what a museum visit is.

### Message

We wanted to make a simple point about what the museum is about. The message is that the museum is 250 years old, holds a large collection of cultural and natural objects and does extensive research in archaeology and natural history. It tells you stories about science, mankind and nature. We have tried to find the essence of each exhibition and relate that to the story of the game.

The game is a way to brand the museum and create a stronger connection with the local community by communicating basic information about the museum and what our main tasks in society are.

### The potential of the game

The initial purpose of the game was to use it as a tool to make new connections between different topics on display, create arenas for cooperation between visitors and create new museum experiences. The games shifts in focus, from objects to stories.

The social aspect of the game is important. We see that when families visit the museum outside a



Figure 3: Using the camera and QR-codes to find answers.

program the children control much of the museum experience (Hjermann, 2008). Parents follow them round at the children's pace. Families spend little time in each exhibition, and messages and main points

of the exhibitions are being missed. We believe that this has to do with the lack of activities based on the needs of these groups. Playing the game can be a way to focus the visit for the target-group. The children can still lead the way because there is no endpoint or starting point of the game. Focus is gained, but freedom is not lost.

Part of the learning process of playing this game is that parents and children can learn about competence within a group, and that learning goes both ways, as opposed to the traditional way of approaching the museum where there is a tendency towards grown-ups teaching children facts by reading text panels written by experts.

Traditional technology for museums can be audio guides or handheld devices that guide you through a set sequence. With the game, you can create your own route, and we also add the element of speed, cooperation and competition to the experience. A question for further research is whether this has the potential to merge flow and meaning, in response to Davidson's blog entry of 6 February 2011: *Games provide flow but rarely provide meaning. Education provides meaning but rarely provides flow.*

Another question is whether the game will be used in subsequent visits? Two things can be done in



Figure 4: Placing objects in the right order.

regard to this. One is to develop a web-interface that allows us to change the puzzles on a regular basis. The framework should make it easy to change the content, but again this is a question of money and

resources. Another solution is to run the game for a shorter period, do research on it with focus groups and write specs for new games based on that. This is probably what the MNHA is going to do, because we have the resource of students seeking projects every semester.

### Conclusion

The main ambition for our first game is related to implementing a new kind of museum experience for our visitors. We want this experience to be positive and playful, and to make new connections between the museum's stories; and we want the museum to be an arena for bonding and social experiences. By using student projects and feedback from focus groups we hope to make gaming a natural part of the museum experience at the MNHA, and in particular with this game we want to turn the museum into a gaming board. The game is now available for free in the Apple App Store: search for *Vitenskapsspillet*.



## **About the Authors**

**Dana Allen-Greil** is Account Director and Digital Strategist in the Social Marketing Practice at Ogilvy Public Relations Worldwide. Prior to her work at Ogilvy she managed social media and digital projects for the Smithsonian's National Museum of American History for eight years. She is the former Treasurer of the Board of the Mid-Atlantic Association of Museums. She teaches graduate museum studies classes on the topic of digital technologies at The George Washington University and Johns Hopkins University. Dana holds a B.A. in English from St. Mary's College of Maryland, an M.A. in Museum Studies from The George Washington University, and was a 2011 participant in the Getty Leadership Institute's NextGen Program.

**Steve Bull** founded Cutlass, an award-winning locative media studio, after graduating from NYU's Interactive Telecommunications Program. Since 2001, Cutlass' mobile tour guides have been available in Canada, the UK, and the US, including niche versions Quirky World and Hollywood-USA. The *New York Times* lauded the launch of the first tour in Greenport, NY. The New-York Historical Society commissioned *Slavery In New York*, a series of mobile tours that were sponsored by the Verizon

Foundation and the US Department of Education in order to extend the museum's physical reach and attract new audiences. Hollywood-USA received a finalist award for TeleAtlas: Maps in Apps in 2007 and was a finalist at the 2009 NAVTEQ Global LBS Challenge. With Hana Iverson, Steve designed *Neighborhood Narratives* for Temple University, and the mobile phone experience for Iverson's Cross/Walks. He also worked in development at Interval Research and designed user action and the prototype for the Experience Museum in Seattle.

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**Kate Haley Goldman** recently joined the senior staff of the Center for Interactive Learning, a non-profit

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**Kathleen Hulser** has been public historian at the New-York Historical Society since 1999. She is currently working on two upcoming exhibition projects. *Nueva York*, a look at the influence of the Spanish speaking world on New York for three centuries, opens at El Museo del Barrio in 2010. *Revolutions: America, France, Haiti* will be the exhibition celebrating the grand re-opening of the New-York Historical Society in 2011. Kathleen also teaches history at the New School and at New York University's Department of Social and Cultural Analysis. Her public programming projects include a walking tour of *Noted and Notorious Women of Lower Manhattan* and a cellphone/iPod tour of *Hidden Sites of Slavery and Freedom* ([www.nyhistory.org/podcasts](http://www.nyhistory.org/podcasts)). She also recently produced a media short on the Marquis de Lafayette, the French Revolution, and the Guillotine.

**Anne Kahr Hällman** (née Anne Kahr-Højland) is Head of the Strategic Unit at the University of Copenhagen, Denmark. Anne has a background as a curator and researcher in the digital facilitation of learning within museums and has been working particularly with Design Based Research. As part of her doctoral studies at DREAM/University

of Southern Denmark, she was the principal organizer of a cellphone-facilitated narrative at the Experimentarium science center. This exhibition, *EGO-TRAP – the cellphone is your key*, opened in a test version in spring 2007. It was designed as a learning resource for pupils in Danish upper secondary schools as a digital narrative - a kind of computer-assisted role-playing game where the visitor takes a guided tour of the exhibition through his/her own mobile phone. Anne has been working with innovative learning resources in theory and practice for more than eleven years.

**James E Katz** is professor and chair of the Department of Communication at Rutgers University where he also directs the Center for Mobile Communication Studies. He holds the rank of Professor II, Rutgers' highest professorial rank, which is reserved for those who have achieved national and international eminence in their field. Professor Katz has devoted much of his career to exploring the social consequences of new communication technology, especially the mobile phone and internet. Currently, he is looking at how personal communication technologies can be used by teens from urban environments to engage in informal science and health learning.

**Arnfinn Stendahl Rokne** has wide experience of exhibition production, having worked at the NTNU Museum of Natural History and Archaeology in Trondheim, Norway, since 1996. Since 2008 he has played a key role in the project team working on the refurbishment of the MNHA, which was awarded Museum of the year in Norway in 2010. Arnfinn is currently project manager for *The City of Knowledge*, a collaboration between the museum, The Royal Norwegian Society for Sciences and Letters and NTNU (Norwegian University of Science and Technology). The aim of the project is to communicate popular science from research institutions in mid-Norway to the general audience through lectures, debates and excursions. He is also part of a research team on museology with participants from all Norwegian university museums called MusVit, funded by the Research Council of Norway. Arnfinn lectures on communication in museum exhibitions and tutors student projects on digital media and interaction in museum exhibitions. He holds a Pg.Dip. in Museum Studies from University of Leicester.

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were commissioned by the Max Planck Society. At Archimedes, he focuses on company management, exhibition design and concepts.

**Elizabeth P Stewart** has been the Director of the Renton History Museum in Renton, WA near Seattle since 2006. She was previously Research Historian for a state-operated museum, the Banneker-Douglass Museum, in Annapolis, MD for six years. She has a B.A. from the University of South Carolina and a Ph.D. in American History from American University in Washington, DC. While completing her degrees, Elizabeth worked at McKissick Museum in Columbia, SC and the Smithsonian Institution's National Museum of American History. She has worked in museums for more than 15 years, researching and organizing exhibits on subjects ranging from the nineteenth-century study of natural history to African-American archaeology in Annapolis. Liz has been the Twitter and Facebook voice of the Renton History Museum since mid-2008; she has a particular interest in social media's role in creating community.

**Beck Tench** is a simplifier, illustrator, storyteller and technologist. Formally trained as a graphics

designer at the University of North Carolina's School of Journalism and Mass Communication, she has spent her career elbow-deep in web work of all sorts – from the knowledge work of information architecture and design to the hands-dirty work of writing code and testing user experiences. Currently, she serves as Director for Innovation and Digital Engagement at the Museum of Life and Science in Durham, NC where she studies and experiments with how visitors and staff use technology to plan, enhance and share their everyday lives.

**Corey Timpson** is responsible for managing design and new media initiatives related to, and supporting all aspects of, the Canadian Museum for Human Rights (CMHR)'s collections, research, exhibits, and corporate. His primary focus at the CMHR is to facilitate interactions and dialogue between and among visitors (on-line and in-house) through the use of new media and digital technology relying on sustainable, scalable, and efficient data and interaction models. Prior to accepting his role at the Canadian Museum for Human Rights, Corey spent eight years at the Canadian Heritage Information Network and the Virtual Museum of Canada where he led the interface and creative design, information architecture, and web management teams.

Outside of the museum office, Corey can be found working on personal digital art, photography, and digital design projects or consulting on creative design and HCI projects.

**Kevin Walker** has worked in and with museums since 1996, including five years as Senior Software Designer for Exhibitions at the American Museum of Natural History. His work has won design awards and artist commissions, and he has numerous publications, including the book *Digital Technologies and the Museum Experience*, co-edited with Loïc Tallon. Kevin holds a Ph.D. from the Institute of Education, London; a Masters in Interactive Telecommunications from New York University, and a B.A. Honors in Anthropology/Mass Communications from UC Berkeley.

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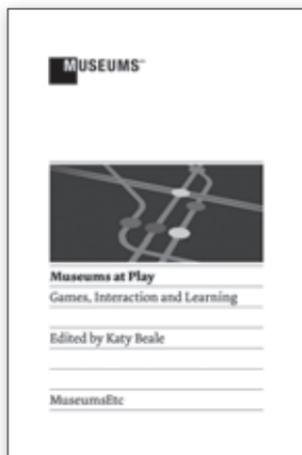
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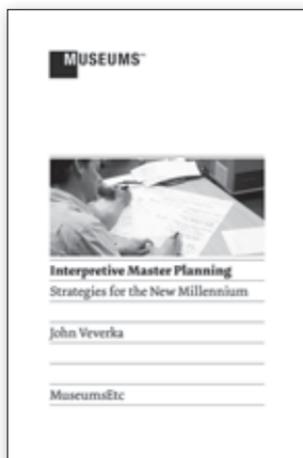
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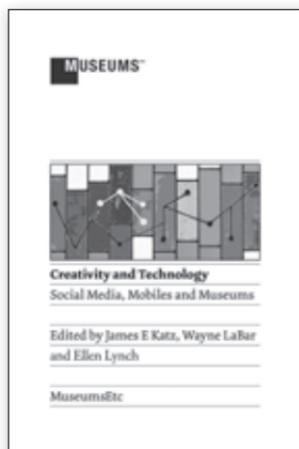
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