Technologies, like Museums, are Social

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Introduction

Technologies are socially constructed. They mutate in the process of finding their social niche, and we come to understand what they "essentially" are by their cultural fit. The telephone made little headway when marketed as a substitute for business to business telegrams, but as a device installed in private homes, prestige and network effects rapidly drove it to the success it enjoyed until its recent challenge by cell technologies. From 1859, when J. J. Étienne Lenoir built the first two-stroke internal combustion engine, until 1878, when Nikolaus A. Otto made a four stroke similar to what we use today, these engines, designed for factory use, found no significant application. It was not until the end of that century that a successful implementation was found, making the internal combustion engine nearly synonymous with the automobile. The fax machine, invented in 1843, found its first practical applications in the early 20th century when it was used to transmit photographs to daily newspapers, but it did not really find its niche until it entered offices in the 1970's and 80's. Now, free-standing fax machines and the facsimile transmission protocols are almost obsolete.

In the past 15 years, the use of the Internet – designed as a packet switching network for connecting computers, but quickly transformed into a network for connecting people by the introduction of an e-mail application – has become nearly synonymous with the Web, which once meant applications using the http protocol but increasingly refers to all non-voice communications over telecommunication networks. Since the millennium, the Web itself has been seen to be mutating from a publishing medium into a social communications environment. The enthusiasm with which museums have taken to these new approaches exposes how much they resisted the concept of the Web as a database access or information delivery environment (a characterization that appealed to libraries and archives) and illuminates their early adoption of meaningful user interaction, user-contributed content and collaboration spaces, even before the 'invention' of Web 2.0.

This year a broad array of Web 2.0 applications and services in museums is being displayed at Museums and the Web. Although social computing is not the only species of Web activity we see, it is dominant for the first time. So, with the pervasive adoption of Web technologies as mechanisms for audience engagement – and the re-situation of the museum on the Web in social application spaces

Museums and the Web 2008: Selected Papers from an International Conference.
J. Trant and D. Bearman (eds.). Toronto: Archives & Museum Informatics, 2008, p. 3
also available at http://www.archimuse.com/publishing/mw_2008_intro.html

controlled by others, rather than exclusively within the private preserves of museum Web sites – museums are encountering new issues and challenges.

Making Communities

When museums first 'opened' their new Web branches in the mid-1990's, they measured success by the number of visitors that came through their doors, much as they had in the brick and mortar museum. While it turned out to be a bit more complicated than they expected (were they to count visitors, unique visitors, hits, pages, downloads or what?), there wasn't much question that success was measured in quantity. With a reconceptualization of the museum Web as an experience, with goals of fostering engagement and on-going relationships, quality is more important than quantity, and the venue of the experience has shifted from exclusively 'on our site' to include interactions taking place in the users' space, on commercial social sites, and elsewhere outside of the control of the museum. As Sebastian Chan explains in the opening chapter of this volume, the first challenge this poses to the museum is to recognize that involvement in Web 2.0 applications means that we will need to measure success differently (Chan, 2008). Only then can we deploy the kinds of tools that will capture meaningful measures, learning how to shape programs to have greater impact. While we are still counting the number of connections through the telephone switchboard, it is hard to gauge the change from ordering supplies to wishing Mom a "Happy Birthday!". But should the question even be how to measure the Web when the Web is simply a means of delivering a museum program? Perhaps we need to return to the museum to look at traditional measures of success: Did members rejoin? Did school groups learn from their visit? Did the new audiences we are seeking to reach encounter the museum at all? Did they engage in the activity that we thought they might find interesting, or did they do something else that surprised us?

The Canada Science and Technology Museum have taken the corporate position that social networking sites outside of museum control, such as Facebook, YouTube, or Flickr, should be viewed as strategic points of presence for the institution. This, in effect, focuses their judgments of success on reading the impact of their external activity on programmes within the museum. It has also required the corporation to explore new methods to assess what are likely to be good investments. In their discussion of how these strategic choices influenced their membership programme, Dawson and his colleagues (Dawson et al., 2008) introduce 'innovation radar' and 'genre analysis' as methods to identify and tune opportunities for museum exposure and engagement using a social application such as Facebook.

The Brooklyn Museum took a 'plunge first, ask questions later' approach (Caruth and Bernstein, 2007), and have now reached a stage in their experimentation with social applications that staff can begin to reflect (Bernstein, 2008). They confirm that the first, and maybe most important lesson drawn from their experience, as suggested by both Chan and Dawson, is that the institution had to 'learn new rules of the road'. The museum needed to clarify its aims, develop clear targets for what it wanted to achieve, find new ways to measure success, and give up some control over where its content would be encountered. But it was also cleverly able to use social sites constructed by others, for its own ends. For example, until November 2007 Facebook did not allow institutional profiles, but Brooklyn was able to link its ArtShare application to the Facebook API, giving it a degree of control and yet leveraging the social site. The institution's commitment to syndicated content allowed it to take

advantage of numerous Web developments that they did not control. What administrator would not like to hear that a tour provided for cell phone access had three times as many uses as the audio tour traditionally rented out with a headset on-site, or that staff decided to terminate experiments with Twitter because Twitter's interaction mode didn't encourage interesting content?

Because this frontier is so new, even when experiments with Web 2.0 social sites have had less impact, or different impacts, than anticipated, the results are useful for the community. New media pioneers from five very different museums report here on what they found when they put museum videos on YouTube (Alexander et al., 2008). Not surprisingly, their experiences were different, beginning with what each institution meant by museum videos. They identified a spectrum of production styles ranging from 'agile' (somewhat ad hoc), through 'adaptive; to 'traditional' or scripted. The preliminary analysis does not have sufficient data to distinguish among responses to each of these styles, but it did find that overall, there was very little user-contributed video feedback, and indeed less user comment than anticipated. Nor was museum-provided video a "big hit" – only one video was downloaded as much as 100,000 times. And YouTube exposure did not help drive traffic to the museum Web site to the physical museum. Nevertheless, museum staff felt that YouTube helped explain concepts to people they don't usually reach.

That the social Web enables those responsible for programs to reach under-represented groups and audiences other than those who might normally visit museums is underlined by the experience of the St. Louis Science Center (Graville-Smith, 2008). The divide between the traditional museum programs and Youth Experiencing Science (YES) which served urban, at-risk teens in St. Louis was so profound that they shared neither a building nor a worldview. Overlooked by those marketing the museum, even when YES was the subject of marketing, the program administrators had to assume huge institutional risks in feeding teen blogging directly to their Web site and using Flickr to post images of in-process science experiments. But the payoff, as hoped, was to earn the trust and engagement of the youth and, in the process, to alert the institution to take a new attitude to the content its users created within museum programs.

Museums with a log-standing commitment to interactive content are also trying to determine just what "user-contributed content" means. The San Francisco Museum of Modern Art launched an exhibition of the works of Olafur Eliasson, a contemporary artist who is opposed to having curators impose their views on his audiences and who wanted to encourage the audience to name, describe and comment on his work without prior expectations being created by the museum (Samis, 2008). The SFMOMA new media group designed a Web environment that invited the public to interpret the works, and they came! What they said ranged from highly personal exclamations (Oooooohhhhh…..!) to complex analysis that sounded much like what museum curators typically provide (and indeed, since we don't always know who commented, this might well have been the initally excluded curatorial voice). Can we learn from a post-hoc deconstruction of these texts? Probably, though perhaps our analysis and categorization tells us as much about ourselves as our users.

The temptation to try to understand our visitors by categorizing them is strong. When the Australian Museum studied 2000 Internet users in eastern Australia, it built on what activities they said they performed on the Internet (Kelly and Russo, 2008). These ranged from passively consuming information provided by others, to commenting on it, and to creating

their own Web content. Characterizing these users on a 'ladder of participation' from passive through highly active, they realized nothing actionable could be learned by comparing these behaviours to those of a similar study in the USA. But much of use to the museum could be discovered if the general population sample was compared to a sample of museum visitors. Finding that this subset was on almost every measure more actively involved than the general population, they hypothesized that virtual engagement might be the way to attract younger people who are generally underrepresented among museum visitors. Based on their findings, they designed an experiment aimed to attract 12-18 year olds to join a 'network of participation'.

Occasionally someone invents something so contagious that it takes off on its own. The Art Gallery of Ontario was just seeking a way to maintain its relationship with museum visitors while its galleries were closed for renovation when it invited the public to contribute their face to an exhibition (McIntyre et al., 2008). Little did staff imagine that over 17,000 portraits would be submitted, or that an ongoing Flickr group would atract over 10,000 images! Obviously, people loved the opportunity to be involved, and to have their portraits shown in this way. The institution needed to respond with great agility to both exhibit the images in its galleries as promised, and to extend the idea to Flickr and incorporate it into an opportunity for the public to curate an exhibit (Collection X). Using RSS they were able to keep the public involved in an ever-changing exhibit, though of course it meant, again, relinquishing control. In some ways the next experiment is the more telling – the National Portrait Gallery decided to take the idea and see if they too could parlay it into a success. Can institutions borrow the structure of a social Web experience and replicate it, as they do in more traditional arenas of programming?

Educators are betting that good models can be replicated. Using software that makes it easy to generate interactive experiences, students in Milan schools are building cultural visit experiences that not only benefit the students and teachers, but draw in families as well (Garzotto and Paolini, 2008). Danish museums, building on successes with young children, are investing in engaging teens (Nielsen et al., 2008). The major finding in their research echoes earlier studies of Web 2.0 – the teens need to feel that they are in charge and are given the full responsibility to produce their own programming. Once given control, the teens market the program virally. The museum can almost sit back and watch it grow, and what a challenge that is.

Realizing Self

However successful Web 2.0 has become, it is still not the only aspect of the Web that is being implemented by museums or the only area calling for greater research. Personalization is one of several lines of research with long histories (by Web standards) that is continuing to engage museums in 2008. Jon Oberlander and his colleagues extended work on personalization and automatic generation of exhibition texts to create an adaptive gallery experience within Second Life (Oberlander et al., 2008). As a visitor's avatar moves through the gallery choosing its own path, the system constructs "label text" to explain the objects being viewed. Using the narration generation approaches pioneered in earlier

work, the Second Life gallery text builds on what the avatar has been told previously, without duplicating content or losing track of context that has already been provided.

At museums in the Netherlands, visitors are being given a tool to create their own route through an on-line exhibition (Wang, et al., 2008). The PDA guide receives the content that the visitor has selected with the ArtRecommender tool, and uses a "tour Wizard" to create a path through it. Using RFID, the PDA is provided information about the location of the visitor, and can then playback the relevant section of the content in a personalized tour.

When such tours take place outside, GIS technologies can integrate museum content in a broader geographical context. In a simplistic sense, GIS plays the same role that the object RFID tag plays in the museum – communicating the location of the visitor – but the potential goes further than that. We can readily imagine how revolutionary it might be if tourists could receive information from numerous museums while they walked through a town or across a park. But integrating objects from around the world and providing them in historical as well as geographical context raises challenges for designing an interface. How should such a portal appear to the user? Leen Breure and colleagues call this interface a "cultural landscape" (Breure, 2008) and envision it as a display of structures, processes and events in the manner of Annales school historians. The challenges are to architect the data and visualize a space in which the individual items of content can array themselves within the broader contexts, so that an experience makes a kind of narrative sense, as it does in an exhibit. The problem then becomes similar to that confronted by Oberlander and his colleagues in personalizing a story so that it "reads" non-redundantly, yet richly.

Some of these research questions are being addressed in practical implementations on a smaller scale. With a controlled set of objects and a known itinerary, the Royal Commission on the Ancient and Historical Monuments of Wales (Pert, 2008) has deployed location-aware PDA's that allow visitors on-site (or guests on-line) to follow a trail and receive content about objects to enliven the historical experience. Future implementations will add audio to the current data streams, receive marker information as well as GPS location data, and allow for mash-ups with ordinance survey maps. But even without these enhancements, the PDA's are "flying off the shelves". Users love the immediacy they provide.

But on the Web, the problem of visualizing potentially huge numbers of objects that are associated with a geographical place, and easily editing maps with such objects displayed on them, requires attention. Liberge and Gerlings (2008) discuss such a map-based publication platform that allows for a time dimension to be added in order to permit the kinds of cultural/historical displays the museum community requires. WatWasWar.nl uses mechanisms such as mouse-over display to show very large numbers of items. Caching of a small amount of metadata per object also adds to the functionality without unacceptably impeding speed. If small amounts of metadata could serve as a handle to a larger set, and provide for the kind of linkages to other similar objects that would cluster the visualizations (whether geographic or not), we would be on the way to a meaningful Web of data.

Such meaningful links between data are, of course, the promise of the Semantic Web. Institutions are exploring this potential in part because it might obviate the need for data normalization on a massive, and insupportable, scale. The theory behind the semantic web, that ontologies

can make linking like objects an automatic function of fairly simple text mining programs, is enticing. Descriptions of applications, however, such as that at the Phoebe Hearst Museum of Anthropology (Schmitz and Black, 2008), too often leave us wondering if they will really work on a large scale. Hopefully, in the future we will see user satisfaction and comparative retrieval effectiveness reports on such standalone semantic search systems. This kind of evidence might help to reduce the widespread skepticism that currently dominates discourse about museums and the Semantic Web.

But in themselves, studies of semantic approaches to searching in single institutions will not resolve the strategic question facing museums – should they commit resources to making their content accessible through the Semantic Web? A group of leading museum technologists and practitioners in the United Kingdom has been grappling with that question over the past year, supported by the Arts and Humanities Research Council (Parry et al., 2008). Arguing that "semantics have always been an integral part of museums", the authors move from the general problem of meaning in objects to the specific problem in the meanings of words given to describe objects. They conclude pessimistically that cultural institutions would need to prepare their content to benefit from the Semantic Web, but that guidelines for how to prepare the metadata to realize these benefits are too contradictory and non-standard to follow. Such conclusions we could readily imagine being valid, though they are called somewhat into question by the judgment of the group that "the danger of the Semantic Web is that, unlike digitization or cataloguing, it is not a coherent practice or set of practices". This a practice of museum cataloguing that we've never met. If only museum cataloguing was a coherent set of practices, with a predictable outcome. Instead it is a highly idiosyncratic activity, different from institution to institution, no less than from specialty to specialty. Would it be more coherent if it were more "open"? It would certainly be more open if it were more coherent.

In the concluding essay in this volume, Kelly et al. (2008) reflect on the various meanings of openness to the museum community and on the problems and opportunities they pose. Open standards sound like an excellent idea to enable maximum access, device independence, and interoperability, but as the authors note, they are often impeded by different interpretations of what they mean and by lack of mechanisms for enforcement. Open source is a practice that encourages maximum contribution by all to the development of shared software, but it frequently fails for lack of implementation support, poor documentation, incompleteness of code and other weaknesses reflecting unmanaged development. Open content sounds essential for sharing cultural heritage knowledge, but who owns what content to share is not a simple matter (as evidenced in Ridington, 2008). Open services would enable greater use, but it is not museum services that museums most want to ride along with, but rather services provided by commercial interests which, when opened, carry museums along on the wave. Overall, the "open culture" that might make museums work better in the Web environment is part promise, part threat. We know we want to give (some) users greater voice. But do we want to give all users greater voice? Is the museum ready to embrace the prosumer (another new/old concept, introduced by Alvin Toffler in *The Third Wave* in 1980)? Is the museum prepared to become a prosumer itself?

Institutions in Metamorphosis

Turning and turning in the widening gyre
The falcon cannot hear the falconer

William Butler Yeats

The Web is a revolutionary technology, not because of technical features such as digital communication, multi-media, or speed of transmission, but because it will soon be truly ubiquitous and it has an extremely low threshold for access. Both of these characteristics give people an opportunity for self-expression and the capacity to challenge authority, wherever, and however, it manifests itself. To some, museums have been part of the authority structure, and their authority is one that should be challenged. Are our institutions ready to play a more equal role in the social landscape?

Museums have also become social venues, intent on their guests having a good time, as well as a meaningful experience. We've become masters of the informal learning environment – balancing the role of hostess and professor. We need to take from this compromise lessons about learning in new contexts. If the museum can emerge as a convener of cultural events rather than an arbiter of cultural truth, it will benefit from the Web more than be threatened by it. What the museum can contribute is an authenticity rooted in its integrity as an institution rather than the authority of its voice.

References

All references are to papers in the *Museums and the Web Proceedings*.