

UTILIZING TECHNOLOGY TO ENHANCE ADAPTABILITY:  
ENCOURAGING SUSTAINABLE EXHIBITS IN THE CULTURAL MUSEUM

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March 13, 2015

Cultural Museum

Cultural heritage institutions have traditionally been viewed as repositories of artefacts, documents, stories, values and cultural evidence of the communities and regions in which they exist. This inherent connection to the past has also instilled an identity of a permanent and unchanging past, often historically represented by immense, outdated exhibition displays that were installed with the idea of permanence. But within this past there lies a complex story composed of layers and layers of connected meanings from a wide variety of perspectives, intertwined and entangled to create a vast network representing what we know of as culture. To demonstrate the truth in this expansive, networked cultural saga that is human history, cultural institutions must be able to utilize a wide range of media applications to present the complete story, from all viewpoints and perspectives. Past mediums for exhibition design have not easily allowed for such complexity, but with the dramatic onset and integration of digital technology and media in the late 20<sup>th</sup> century and beyond, institutions once viewed as static and inflexible are now able to represent multiple facets of complex human histories from the past into the future.

### **Part I: Purpose, Target Audiences & Methodology**

This is especially vital for exhibitions such as the Oregon Museum of Natural and Cultural History's *Oregon: Where Past is Present*. With a focus on both past histories from many voices, present native culture and all of the change and influences in between, such an exhibit must have a broad toolbox of media at its disposal to represent such a broad and multi-faceted story. MNCH has recently created momentum around improvements in budget, facilities, research, exhibits and education (Museum of Natural and Cultural History, 2014). It will be a challenge for the institution to continue this momentum, and keeping up with current trends in information consumption and visitor behavior is essential to that growth. Implementing technology and media into exhibits is essential to connecting to audiences to which this type of information acquisition has become a standard part of daily life. Currently, the exhibit is hallmarked by large, permanent installations, static displays, and very little opportunity for participation, engagement and interpretation. This analysis will present a case study of the exhibit *Oregon: Where Past is Present* and will delineate some of the best practices incorporating contemporary technologies in museum exhibitions in order to encourage implementation of similar strategies that allow for this exhibit to be more flexible and continually adaptable in the present and future.

One of the museum's guiding principles is to provide exhibits and programs that are interpretive and that engage broad audiences. The audience that they hope to access is quite large, and specific media and technology implementation would provide greater accessibility to these different audiences and would encourage participation and interpretation by younger audiences, which is essential since the museum is situated within a university environment. Improvements in technology would greatly benefit

University of Oregon students, scholars, faculty and staff, providing greater ease and opportunities for use in teaching and learning, elementary and higher-education students and teachers who will more easily be able to connect to complex material, and community members and tourists. It would also benefit native people who would have a better opportunity to contribute their stories and accurate representations of their culture today (Museum of Natural and Cultural History, 2014).

To evaluate the exhibit *Oregon: Where Past is Present* and provide possible technological solutions to improving flexibility and adaptability, this analysis has utilized a variety of data collection methods. These include notes from four different focus groups devised of museum volunteers, community members, teachers and professionals in museum practice and archaeological sciences. Each focus group analyzed the exhibit and responded to questions during a discussion in order to identify elements of the exhibit that were effective or that needed to be improved. Other data includes observational information collected from tracking 36 different individuals through the exhibition space on various days over the course of about four weeks. This study provides valuable data on spatial movement, engagement, usability and interest. Additional data includes critical exhibition framework analyses of whether the exhibition was comfortable, engaging, reinforcing and meaningful. These were collected through thorough individual analysis by 18 graduate students in from the Cultural Museum course at University of Oregon and synthesized to show patterns of agreement and disagreement. Lastly, these were supplemented by review of supporting literature on technology and media in cultural institutions and how technology can support sustainability and adaptation.

## **Part II: Data Analysis & Interpretation**

To survive change and to be more resilient to economic downturn and changes in visitor behavior and needs, museums must be flexible (Clough, 2013). Exhibitions such as *Oregon: Where Past is Present* that are constructed with large, unchanging dioramas, walls of display cases, and panels of static and overwhelming text and images require necessary changes in order to keep up and remain relevant. Others (Clough, 2013) have stated this problem perfectly: “For today’s museums, the institutional question at hand is: Are brick-and-mortar museums, with their curators and expensive collections, going to be victims of the digital museum?” To adapt to current learning and visitor experience models, cultural institutions must transition from being “bounded” organizations, “defined by physical, intellectual and historical constraints,” to “unbounded” organizations looking ahead with a more progressive attitude of adaptation and innovation (Poole, 2014). In this instance, this means continually testing new media and technology as a way of allowing greater flexibility in design and experience, and incorporating successful methods as

part of the institution's core practice. As content and visitor needs change, the museum must be able to more easily adapt its exhibit presentation in reflection. They must think differently.

The most ominous challenge for *Oregon: Where Past is Present* is the evidence that the exhibit as a whole is not engaging and there is a lack of connection and reinforcement of meaning. This is evidenced by lower ratings demonstrated in the exhibition framework in these categories, critique from focus groups and repeatedly brief visitor interaction in the exhibit hall. The most prevalent common themes that emerged from both the framework and the focus groups revolved around lack of participatory or interactive materials, overwhelming information presented in a way that is difficult to comprehend, lack of focus and connections, inability to stir interest, and an overwhelming sense of the exhibit being outdated and static. Most participants in both the focus groups and exhibit framework studies agreed that the exhibit contained a considerable amount of valuable content but lacked certain elements that stimulated interest, relevancy and visitor connectivity.

This is reinforced by the data collected on length of visitor interaction. Over the course of 36 observed visits, the average time spent was approximately 18 minutes. Many individuals, about 38%, were in the exhibit hall for less than 10 minutes. This is very close to the 43% who averaged 18 minutes. This very brief amount of time is highly disproportionate with the heavy amount of material intended for viewers to interact with, and this suggests that most visitors do not feel engaged and are leaving the exhibit without learning much at all. In order to experience the exhibit at its fullest, a visitor would have to be in the exhibit hall for a much longer amount of time, possibly hours, yet only 19% of the visitors in this study were in the hall for over 30 minutes and none longer than an hour. Most visitors spent time reading and observing the artefact cases and visual and textual displays on the right hand side of the hall, but even here, interaction tapered significantly by the end, with a quarter of the visitors skipping the last section entirely. These specific areas did a better job of connecting text with artefacts, images, maps, diagrams and stories but still relied on static material and only utilized the viewer's abilities to read and observe.

Cultural institutions, specifically those with expansive collections such as the Oregon Museum of Natural and Cultural History, have shifted their focus outward to provide educational services to the public and their communities. As a result, they have had to more strongly consider the quality of visitor engagement and what specific mediums are utilized in order to stimulate interest and engage visitors (Weil, 2002). Even though MNCH has amassed an impressive collection of over 427,000 artefacts (Museum of Natural and Cultural History, 2014), it is not the collection that defines the success of the institution, but rather how it can effectively educate and connect the community, or *use* the collection,

while providing valuable resources for lifelong learning and research. There has also been a shift in the role of the visitor from recipient of instructions and explanations, as represented by the expectation of reading and observing in the MNCH exhibit, to that of participant, guided by their own interests and given the ability to provide their own interpretations. This idea is demonstrated in the Exploratorium's guide to APE (active prolonged engagement) exhibits (Humphrey and Gutwill, 2005). Innovative uses of media and technology easily allow for visitor-directed behavior and participation and help to put the visitor in the "driver's seat" of their own museum experience.

While some of the greatest expenses were incurred in constructing the basket and artefact display case walls in the exhibit hall, this area was mostly ignored in comparison with the rest of the exhibit. Most interacted with the cases at the very beginning of the exhibit, but this interaction decreased dramatically by the end, with as few as 22% of visitors stopping and 16% interacting with the display cases for at the end for longer than 30 seconds. Focus group participants generally agreed that the basket display cases were dark and difficult to see and did not provide opportunities to really understand the processes and techniques by which the baskets were made nor how they connected to the larger narrative. This was a similar case with the dioramas, which many expressed were "outdated," "looked dirty" and were "static" and "not dynamic". They had a hard time understanding why they were necessary to illustrate ideas and how they properly connected with the complexities in the overall narrative. The display cases, dioramas and large text panels make up almost the entire exhibit yet few people expressed satisfaction with what they had to offer. Cultural museums such as MNCH often cannot afford costly permanent displays or the expense required to make future adjustments to these displays as the museum adapts. The use of media technology allows for achievement of more outcomes with fewer and smaller amounts of material and effort (Bearman and Geber, 2008).

To develop dynamic displays that improve with use, exhibits must incorporate participatory activities that allow for visitors to add to the quality of the exhibit. Cultural institutions that are tied directly to a place must be responsive to the community and change with the generations who live there, for each generation learns and lives in a different way (Bearman and Geber, 2008).

This direct connection to the specific culture of a community or region, such as Oregon, means the cultural exhibits that are attempting to tell the holistic story of a specific people must use a variety of media to encompass the truths of the past in all of their complexities, the stories and traditions of the present and the many layers of change and meaning in between. Focus group participants emphasized the lack of attention given to important sensitive pieces of native history and the lack of demonstrative change over time. While the exhibit provides great detail on the history of Oregon tribes, current

traditions in native culture are given a back-seat and often completely shadowed by historical information. Many agreed that it will be essential in the exhibit redesign to include individual stories, opportunities to learn about traditional processes and techniques, hear the language, and see culture in action through video and digital imagery.

Technology plays an important role in helping to transform the static museum of past and history to a dynamic community institution that can help redefine what “indigenous,” “artefact” and “past” mean for us today (Newell, 2012). It accomplishes that by relying on varying perspectives, stories and layers of meaning that intertwine to form a more holistic truth. Rather than providing content filtered through a strictly western perspective, as verified by MNCH focus group and framework participants, museums can utilize technology to more easily incorporate differing perspectives, and even allowing visitors to contribute their own. This reinforces the idea of stewardship that MNCH has prioritized in their strategic plan (Museum of Natural and Cultural History, 2014). The complexities of cultural history can only be well-represented in dynamic presentation utilizing a wide variety of media including technology to engage all of the senses and to tell a holistic story. The good news for museums such as MNCH, which boast such a rich collection and array of valuable content, is that content is still king, almost at a higher level with the integration of technology. Museums are holders of a huge body of content, they must only determine how best to distribute it to a body of consumers eager to connect, share and co-create. The challenge is for the institution to start with the content and then determine the best method of delivery, rather than starting out with the mind-set of incorporating technology for the sake of being current (Honeysett, 2015). This mistake of delivery can also be made with physical design, as exemplified by overwhelming displays in the *Oregon: Where Past is Present* exhibit that do not do their stories justice.

With such dependency on static exhibit design materials, major changes will have to be made in order to incorporate a more flexible design structure. Structures and expectations of old media should not restrain the creative potential of new media (Newell, 2012). Technology allows organizations to “continually preserve their core values and beliefs while re-conceptualizing their environments of learning, discover and transaction” (Bearman and Geber, 2008) to better suit their visitors, and this visitor need is clearly evidenced in collected data. We now know that there are five main types of museum visitors as outlined by John Falk: explorers, experience seekers, facilitators, professionals/hobbyists and rechargers, each entering the museum with different expectations and requirements (Falk, 2009). The visitor experience is not rigid, but rather complex and unpredictable except for generalizations one can make in regards to the common objectives individuals have for their museum-going. For museums to continue to attract a broad range of visitors, new technology and media will need to play an integral role

in redesign in order for the exhibit to reflect current and future visitor preferences and expectations. As technology continues to evolve in society, it will have to equally evolve in the museum sphere.

### **Part III: Recommended Redesign**

The Oregon Museum of Natural and Cultural History's exhibition *Oregon: Where Past is Present* offers a golden opportunity for the integration of technology and media to create a more engaging and dynamic learning experience. While the current exhibit design has many weaknesses, the content and mission of the exhibition, with its emphasis on geography, place and human stories provides excellent fodder for an exhibit design integrating both the physical and digital realms. The following recommendations will focus on moving the "visitor" from a passive to active role, challenging traditional views on institutional knowledge creation, and permitting the museum to act as a facilitator and supporter for knowledge creation and consumption (Walker and Tallon, 2008). These recommendations also present technology as a method of capturing what Walker and Tallon (2008) characterized as the "conversations on the way home" which often are rich interpretations of meaning from the exhibit. These proposed changes broaden the experience so that it supports feelings and emotion and not just knowledge and cognition. They also place greater emphasis on connective narrative within the exhibit as well as continuing outside of the museum (Stogner, 2009). The outcome of this recommendation is a digital network or "geo-framework" of information; an infrastructure of narrative that frames the entire exhibit, connecting artefacts, histories, and stories of people and place to geography by linking the physical and digital realm inside and outside of the museum.

This concept involves the possibility of a wide range of implementations, but revolves around the idea of building a more holistic narrative that can be created and accessed in a multitude of ways. It is dynamic and flexible, and will grow and change along with the identity of the place to which it is attached. In its simplest form, it involves linking museum content to specific place, allowing visitors to contribute to the narrative, experience the narratives contributed by others, share content and materials to their own experiences as they travel throughout Oregon. The current exhibit already demonstrates a heavy emphasis on the people and places of Oregon, so it makes sense to allow people to connect these stories to Oregon places in real life. It also allows visitors to engage with the museum and expand their learning outside of MNCH and across the entire state of Oregon, making connections between the historical content of the museum, the stories of real people, and the actual places as they exist today. It is essentially a MNCH roadmap or travel companion; a true guide to Oregon's past and present.

A good example of how this might be manifested is the Atlas of Rural Arts and Culture created by Art of the Rural, an organization that serves as a hub for rural arts and culture across the country (Art

of the Rural, 2015). The atlas links projects, stories, people and resources to specific places in the United States, allowing visitors to tag and create stories, comment, share, and curate their own favorites. MNCH could host a platform similar to the Atlas of Rural Arts and Culture, but this digital interactive map of Oregon would be the infrastructure or foundation from which an entire exhibit would develop. The content of the exhibit, which would include artefacts, diagrams, text information, images, video, audio stories and language, tutorials, projects, and resources would all be connected to the places represented in the map. This would allow visitors to learn about the past and present of the three geographical regions of Oregon in a way that is much more holistic and engaging. The framework would allow for greater connection between all the elements of the exhibit and provide opportunities for reinforcement of concepts through a variety of media. It would be important to use visual design elements coordinated throughout both the physical and digital spaces to properly facilitate these connections. This could be organized into a simple color coding system to link content to each of the three main geographies of Oregon. This would make it much easier, especially for younger visitors, to make connections within each geographic region. The interactive geo-framework and its corresponding map would be available both online and as part of the physical exhibition, likely best represented as a touchscreen that would give access to all of the content associated with each location on the map.

Artefacts would become “smartefacts” (Bearman and Geber, 2008) with QR codes on each label linking them to their corresponding places and stories within the geo-framework. This would not only provide greater ease of learning for those not able or willing to read large amounts of text, but would also provide access to a wide array of supplemental materials that might include such things as videos, audio recordings, images, information on historical places and people, stories, news, facts and interpretations. It would also link the artefact to other information or other objects within the exhibit, allowing the visitor to create much deeper connections between things in the collection and the contexts within which they are situated. This process of seeking information gives the visitor much greater control within their museum experience, allowing them to pick and choose where they want to dig deeper, instead of being confronted with too much information all at once. It also allows for varying perspectives and alternative interpretations, even allowing visitors to contribute their own stories and experiences, tag information, create their own collections and share content. The supplemental material would have varying levels, from animations and activities for kids to in-depth resources for scholars and professionals, including links to a digital library or “booklist” coordinated in partnership with the Oregon library system.

The variety of media that could be included within the geo-framework is potentially limitless. Much of it might be accessed only within the digital realm, but many artefacts, text displays, audio recordings, videos and other content might be represented digitally as well as displayed within the

physical exhibit space. Many of these media possibilities have already been outlined above, but additional material might include past and present images of specific places that have been dramatically changed as time has progressed. These might be incorporated within slideshows, but should definitely be associated with specific locations as part of the geo-framework. An important component would be the integration of native stories to provide alternative perspectives and intimate views into native life in the present day. A combination of audio, video and visual imagery would increase emphasis on changing traditions and how they have developed over time. These would include collections of individual stories associated with specific places, and provide opportunities for people to learn about traditional processes and techniques. The framework would allow for the recording, storing and sharing of cultural heritage while connecting it to physical artefacts and places.

Visitors and remote participants could create member profiles which would allow them to contribute to the framework, tag content, leave comments, annotations, resources and audio responses, as well as create their own stories. All visitors would be able to share content on social media, which would be encouraged on all levels. Social media would also serve as a site for creation and connection of the materials. It would be another link to the geo-framework but would be a more open public platform for photos, comments and stories. Specific hashtags would be created for people to connect their content to the MNCH exhibit, possibly linked to each geographic area or to a specific narrative within the exhibit. By utilizing the hashtags (ex: #OregonCulture #ThisisOregon #TheGreatBasin #OregonStories), participants could add to a larger narrative demonstrating what these places are today or what Oregon culture looks like today. This would also expand to video social media sites such as YouTube and Vimeo through which the museum and its supporters could post and engage with relevant video content that would be shared through social media and also possibly included as part of the geo-framework. Through play, creation, critique and collaboration, all types of visitors could find a way to be engaged that suits their personal learning style and would be able to take back control of their museum experience (Walker and Tallon, 2008). As Simon discussed in her influential book, *The Participatory Museum*, cultural institutions must consider participation in all forms, understanding that not all visitors want to create but would rather have the opportunity to categorize or organize information (Simon, 2010). It would be important to provide a mix of structure and freedom both within the physical exhibit and the geo-framework, providing clear direction but also broad capabilities for interaction and exploration that allow the visitor to keep getting more involved if they choose to do so.

Educational tools would be presented within the geo-framework as “Education Modules” paired with each geographic region. Each module would include instructions on how best to use the framework for classroom use or for classroom visits to the museum. Within the physical exhibit space, classes would

most likely use the touchscreen map to access the supplemental materials within the framework as a group. The modules would provide opportunities for students to give feedback or to reiterate what they learned, uploading audio content or written comments. Each module would be paired with digital lesson plans. These lesson plans might suggest opportunities for class projects to interview long-term residents and extended family about the heritage of Oregon, providing students the opportunity to contribute to a database linked to the geo-framework.

One of the most exciting aspects of the framework would be its capability to respond to specific GPS coordinates, providing museum members who are linked in to the grid the opportunity to “check-in” to locations, much like what we can already do with social media, as well as sign-up for texts and emails with links to content based on current member location. In this way, the MNCH geo-framework would act as a sort of travel companion or roadmap, linking experiences with real places in Oregon to museum artefacts and digital content and greatly expanding the influence of the museum and its collections. “Location-aware services can bring people museum content where they are, in the wider world, and enrich their lives with museum knowledge, without requiring them to come into the museum’s space (Bearman and Geber, 2008).” As a MNCH member I could access the Geo-framework as I travel throughout Oregon, accessing educational material that would give me information on the past and present of the place while linking it to a variety of media content and specific artefacts in the museum that I have explored when visiting. Each object displayed in the exhibit (and eventually the entire Oregon collection) would be linked with a specific location. These “DigiMarkers,” as titled by Bearman and Geber (2008), would “enhance documentation about objects in the collections to add geographical coordinates for locations where they were created or found, used, collected and bought or sold. Objects can ‘report’ themselves to people outside the museum who are nearby these places by location-aware narrowcasting.” The framework would also identify places and buildings of historical or cultural interest within the same location. If I signed up for the text or email option, I would automatically receive a link to this content once I arrive to the specific location, giving me the option to “check-in” at that location. This would create a digital map of visitor activity, showing where members have traveled throughout the state based on check-in points that would be linked to photos, comments and stories specific from that person. These member profiles would be part of a social network within the geo-framework that would link personal profiles and stories to real places and allow members to contribute their own interpretations to supplement museum content.

Carrying this theme of connectivity, access and interpretation throughout the exhibit, the recommended changes might include implementations of other media as well. This would include cell phone call-in interpretations through which a visitor could call in with their mobile phone to listen to an

interpreter providing supplementary information or an audio version of the visual text. This is especially beneficial to people faced with literacy or visual problems, and would be an ideal tool for language accessibility. It could even be used to provide audio examples of native languages. Not everyone has a cell phone, so it would be important in some cases to provide systems built into the exhibit for audio recordings that are especially important to the exhibit, such as native language samples, stories or explanations. These audio clips would also be accessible via the geo-framework, providing interpretive material and examples of native languages associated with place. Audio recording devices, which are generally low cost, could be provided to record visitor responses, limiting visitors to 30 seconds or one minute, which would encourage them to focus their response to one display or carefully consider their words. These collected responses would provide valuable feedback and interpretations that could be incorporated as part of the exhibit, the geo-framework or used separately on the MNCH website. They might also be incorporated into videos about MNCH and the specific exhibit hall which could be shared through social media.

Part of the geo-framework experience might be a digital trivia game that would encourage visitors to be more immersive with the material and to spend more time exploring. Members would be assigned a geo-framework ID and the game would record trivia scores associated with each participant. These scores would be linked to the member's framework profile. Much like an arcade game, visitors would be able to see how they ranked compared to other participant standings. This might also tell museum administration what specific content is being accessed and what is not. The trivia game would be introduced at the beginning of the exhibit but visitors would interact with it at the very end, testing the knowledge that they gleaned from their visit while also reinforcing important information. Because MNCH already hosts live trivia, this would be a fun way to further engage visitors, provide learning incentives and creating friendly competition.

It would also be important for the geo-framework to be mobile accessible, encouraging visitors to navigate the framework with their mobile devices (phones and tablets) as they navigate throughout the exhibit, but also outside the museum as well. This would allow visitors without smartphones to access QR codes for supplemental information as well as explore the geo-framework individually. Mobile exploration would be most utilized outside of the museum or in a situation in which the installed touchscreen is already being used by others. For those without mobile devices and unable to access the touchscreen, a PDA (personal digital assistant) customized specifically to host the geo-framework, and safely connected via a lanyard to the person, could be provided by the museum. The museum would likely only need to provide a limited number of PDAs depending on number of visitors present in the exhibit hall. In an evaluation of PDA trials at four diverse UK museums, researchers found that "the PDA

is at its strongest with young people in leisure mode,” and that “there may also be an opportunity to hook in non-visitors to museums, who like learning through entertainment and have become disenchanted with the traditional museum agenda (Walker and Tallon, 2008).” The research also demonstrated the potential for engagement is not limited to the young, and that “traditional visitors found interpretation through the PDA to be absorbing, enlightening and valuable.” This makes sense for a museum that is situated in the midst of a university campus, but it seems that it would also engage more traditional visitors as well.

Other technology that would increase interest and flexibility of exhibit design could include holograms and projections to take the place of large permanent dioramas. While I am not sure that the technology exists currently to allow these to be energy-efficient and cost-effective options, they may become viable solutions in the near future. For sensitive objects such as the delicate baskets that must be carefully displayed and lit, it would serve the visitor well to have some sort of digital imaging available next to these displays that would allow the visitor to zoom in on high resolution images of these artefacts in order to see the intricate details. Animations could be included to demonstrate how these artefacts were created and used. When paired with tactile examples that could be physically handled, these particular displays would be much more engaging for children and adults.

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