

# **Creating Museum Multimedia for Everyone Museum of Science**

## **Prototyping Workshop Formative Evaluation Report**

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## INTRODUCTION

### *Project Background*

*Creating Museum Media for Everyone* (CMME) is a proof-of-concept collaborative project between the Museum of Science (MOS) in Boston, WGBH's National Center for Accessible Media (NCAM) and Ideum (Funded by NSF-DRL, award number 1114549). The project aims to show how digital interactive museum exhibit devices can be designed and developed for visitors who have a wide range of disabilities. Current deliverables include two exemplar exhibition components in which museum visitors will learn STEM concepts by manipulating and analyzing real data. As the project continues, it will develop and test the efficacy of a prototype Do-It-Yourself (DIY) Toolkit designed to support other museum professionals in implementing the digital interactive strategies. Also under development is a white paper on the specific exhibit exemplars and a research paper with guidelines for digital interactive exhibits in museums.

To create these deliverables, CMME utilized an innovative workshop approach, which brought together individuals from a diverse range of fields to develop the digital interactive strategies. This formative evaluation report is focused on that workshop. The workshop occurred May 21-25, 2012 at the Museum of Science, involving experts in disabilities and universal design, along with exhibit designers and developers. The workshop began with two days of presentations by experts and advisors, followed by three days of prototype design work.

Currently, the CMME team is working on developing the prototypes; they will then proceed to test those prototypes with visitors. After developing the exemplar exhibits, the *CMME* team will next develop the DIY Toolkit for museums, concentrating on those which do not have the same level of exhibit development resources as larger institutions, with the aspiration that other museums will adopt CMME techniques and exhibitry. The project's summative evaluation will not only determine if the exemplar works well with a wide range of people with disabilities, but also determine the cost-effectiveness and efficacy of the workshop strategy and the ability of other museums to use the DIY toolkit.

### *Goals*

The goal of the CMME project is to produce exemplar digital media interactives and online resources museum professionals can use to invite all visitors, including those with disabilities, to be inspired by science, technology, engineering, and mathematics (STEM). Through this collaboration, CMME intends to spur innovative accessible designs and further the field's capacity to research and develop digital media interactives for science museums exhibitions that engage people with and without disabilities in informal science learning.

The primary professional audience for CMME is defined as exhibition professionals, including exhibition designers, IT specialists, developers, and project managers. These individuals will be impacted through project deliverables such as the research-based tools, and all resources and strategies for designing digital media interactives for science museum exhibitions that are inclusive of people with disabilities. Intended impacts include the following:



- **Knowledge and understanding** of 1) digital media interactive designs for science museums that are inclusive of people with disabilities, and 2) how people of a broad range of abilities and disabilities interact with digitally-based interactives in a science museum environment;
- A change in **attitude**, where professionals are more likely to feel 1) it is possible to design and develop digitally-based science museum learning experiences that are inclusive of people with disabilities and 2) people with disabilities are a target audience for science museums; and
- Increased **skills** related to the process of designing and developing digital interactives that are inclusive of people with disabilities, including 1) capacity to work with people with disabilities to design and develop new exhibits; 2) new connections with individuals from other fields and disciplines who might be able to provide solutions to existing challenges or problems; and 3) ability to create refined digital media interactives using CMME modules.

These impacts were specifically chosen with the ultimate aim of achieving a longer-term impact of change in practice within informal science education institutions. These impacts were specifically chosen to achieve long-term impacts; to cause lasting change within informal science education institutions.

### ***Evaluation Focus***

During the formative evaluation phase of the workshop, Audience Viewpoints assessed the workshop both in terms of practical effectiveness and in terms of meeting project goals. As the workshop was fundamental to the success of the CMME project, Audience Viewpoints spent considerable time documenting the workshop process. Specifically, this evaluation focused on the format and cohesion of the workshops (including composition of activities), suitability of the individuals involved, facilitation, pacing, and appropriate amounts of time and material resources. As the overall elements of the workshop are fundamental to potential dissemination within the field, we also reviewed the workshop model with the participants and have sought to situate that model within the larger field of similar design workshops.

The CMME team believes the process for developing these products was critical to creating robust, transferable prototypes with wide utility within the field. This short report is designed to provide analysis of workshop components and composition, including recommendations for how future workshops should be run should a further implementation project be funded.



## OVERVIEW: METHODS & LIMITATIONS

### *Methods*

This workshop evaluation consists of four main sources of data:

1. Surveys conducted at the beginning of the workshop to assess professionals' entry knowledge, skills, goals and concerns for the workshop.
2. Observations of participants during ~~Participant observation~~ of the workshop, including interactions between facilitators and participants and among groups of participants.
3. Post-workshop web-based surveys in June 2012, focusing on logistics and utility of workshop components.
4. Post-workshop telephone interviews with selected non-MOS participants (n=10) to discuss perceptions of workshop value and professional learning. The interviews focused on participant understanding of their own gain in knowledge and skills, level of comfort with the process, perception of the workshop model, and assessment of value of the component parts.

The bulk of the data and quotes within this report are from the post-workshop web surveys and the subsequent telephone interviews. All quantitative data unless otherwise noted is from the post-workshop survey.

### *Limitations of the Study*

The conclusions gathered here are based on a relatively small population, those that attended the workshop. Further, the sample for both the surveys and interviews excluded both the Principal Investigators and substantial portions of those individuals who work for the Museum of Science. This was done to prevent the large numbers of individuals from the hosting institution biasing the responses. We felt they might share an advanced shared philosophy in how accessible exhibits should be designed due to the extensive amount of work MOS has done in this field. Thus most, but not all, of MOS participating individuals were excluded from the follow-up data collection. Those that were included within the sample were from an exhibit design rather than an evaluation orientation. Given the framing of the sample, it is possible we have biased the results in some other unknown direction.



## FINDINGS

The findings for this report cover three major overarching areas: the satisfaction and utility of the workshop elements, reflections on the workshop model, and workshop impact and participant thoughts looking forward.

We asked participants to complete a short survey as they came into the workshop, to give a sense of their incoming knowledge, skills and preparedness. Participants felt moderately prepared to participate (Table 1) with a median rating of 5.1 on a 7-point scale, with 7 meaning highly prepared to participate.

### *Incoming Participant Knowledge and Reactions*

**Table 1: PREPAREDNESS TO PARTICIPATE**

1 - Highly Unprepared	2	3	4--- Neither Prepared nor Unprepared	5	6	7 - Highly Prepared	Median Rating
0	2.8%	5.6%	27.8%	19.4%	32.6%	13.9%	5.11

We asked participants to tell us whether they had concerns upon entering the project. Participant concerns tended to fall into two categories; first that the project might be too ambitious to achieve the stated goals, and secondly, that they may not have enough to offer and contribute to the process.

*Actually finishing out the week with practical, usable, translatable tools seems like a lofty goal.*

*That it's an ambitious goal!*

*That the interactive won't be as useful as possible. But we will not let that happen!*

*I hope it is well run and useful to participants. These workshops can turn into grant "Deliverables" with little benefit to the participants.*

*None, except possible that quite enough time to completely finish prototypes. But I expect a great start.*

*I am relatively new to the ISL (ISE) field and so feel that I have much to learn! This is both good and anxiety producing ;) as I hope to be able to contribute the knowledge I have.*

*Just that I'm relatively new to this.*

We also asked participants whether they felt they might find new collaborations while at the workshop. To some extent this was less an evaluation-based question and more a primer to start them thinking about being open to collaborations, and how they might collaborate with other participants. Over a third of the individuals (37%) rated themselves highly likely to form collaborations (See Table 2). Approximately 20% rated themselves below a "5," either neutral or unlikely to form collaborations.



**Table 2: HOW LIKELY ARE YOU TO COLLABORATE WITH NEW PARTNERS MET AT THIS WORKSHOP?**

1 - Highly Unlikely	2	3	4--- Neither Likely nor Unlikely	5	6	7 - Highly Likely	Median Rating
0	2.8%	5.7%	11.4%	14.3%	31.4%	37.1%	5.83

As might be expected, most individuals within the workshop did not claim to have expertise in multimedia universal design in the science museum setting. No one rated themselves on the highest end of the scale, and the median rating for both knowledge questions was slightly below the scale’s midpoint.

**Table 3: INCOMING KNOWLEDGE**

	1 - I know almost nothing	2	3	4	5	6	7 - I’m an expert	Median Rating
Digital interactive designs for science museums that are inclusive of people with disabilities (n=34)	5.9%	5.9%	14.7%	47.1%	20.6%	5.9%	0.0%	3.88
How people with a broad range of disabilities interact with digitally---based interactives in a science museum (n=34)	5.9%	5.9%	26.6%	35.3%	11.8%	14.7%	0.0%	3.85

Participants felt slightly more comfortable with their incoming skills over their incoming knowledge, and rated themselves at or above the midpoint in skills related to the task and their capacity to work with people with disabilities to design and develop new exhibits.

**Table 4: INCOMING SKILLS**

	1 - I know almost nothing	2	3	4	5		7 - I’m an expert	Median Rating
Skills related to the design and development of digital interactives inclusive of people with disabilities (n=34)	8.8%	8.8%	23.5%	23.5%	11.8%	14.7%	8.8%	4.00
Capacity to work with people with disabilities to design and develop new exhibits (n=34)	6.1%	9.1%	12.1%	30.3%	15.2%	18.2%	9.1%	4.30

### ***Workshop Length and Timing***

The workshop was officially 4.5 days long, though some team members worked late into the night to complete their prototypes. While individuals commented that it was difficult to carve out a full week for this workshop, over three-quarters of the participants (77%) stated they felt the workshop was the appropriate length of time. The remaining 23% were split evenly between thinking the workshop was





too long or too short, suggesting in fact the workshop was exactly the right length.

**Table 5: LENGTH OF THE WORKSHOP**

	<b>% of Respondents</b>
<b>Too long</b>	11.5% (n=3)
<b>Too short</b>	11.5% (n=3)
<b>About right</b>	76.9% (n=20)

The majority of attendees (70%) felt the amount of informal networking time was appropriate, with approximately 18% wishing there had been more time.

**Table 6: WAS THE AMOUNT OF INFORMAL NETWORKING TIME ENOUGH?**

	<b>% of Respondents</b>
<b>Much less time than needed</b>	7.4% (n=2)
<b>Somewhat less time than needed</b>	11.1% (n=3)
<b>About the right amount of time</b>	70.4% (n=19)
<b>Somewhat more time than needed</b>	7.4% (n=2)
<b>Much more time than needed</b>	3.7% (n=1)

### *Workshop Quality*

Overall, participants were positive about the workshop, and satisfied with the logistical structure, elements and workshop components.. Respondents were most positive about the accommodation of special needs for the workshop (65%), and for the workshop facilitation (63%), with approximately two-thirds of respondents giving those two attributes the highest possible rating. They were also highly positive regarding the advance information on logistics, the workshop materials, and the meals and lodging with over three-quarters of individuals giving these items a 6 or 7 on a 7-point scale. While the majority of individuals rated advance information on workshop logistics and agenda highly, these two items also had the largest distribution of responses, with several individuals rating the advance information on the lower end of the scale. Advance information on workshop logistics had a median rating of 5.59, and advance information on workshop agenda had a median rating of 5.52.

**Table 7: QUALITY OF WORKSHOP LOGISTICS**

	<b>1... Poor</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7... Excellent</b>	<b>Median Rating</b>
<b>Accommodation of special needs for the workshop (n=26)</b>	0	0	0	0	0	34.6%	65.4%	6.65
<b>General workshop facilitation (n=27)</b>	0	0	0	7.4%	14.8%	14.8%	63.0%	6.33
<b>Workshop materials (n=26)</b>	0	0	3.8%	3.8%	11.5%	46.2%	34.6%	6.04
<b>Meals and lodging (n=25)</b>	0	0	0	12.0%	20.0%	40.0%	28.0%	5.84
<b>Advance information on workshop logistics (n=27)</b>	3.7%	3.7%	3.7%	11.1%	3.7%	44.4%	29.6%	5.59
<b>Advance information on workshop agenda (n=27)</b>	3.7%	0	7.4%	7.4%	22.2%	29.6%	29.6%	5.52



## Utility of Workshop Components

When respondents were asked to rate the utility of the main workshop components, there were quite a variety of answers. The highest ratings were for the presentations of prototypes (6.33 median) and the advisor presentations (6.19 median). The lowest ratings were for the small group discussions (5.46 median) and the presentation of the Hall of Human Life (4.86 median), both of which were still above the midpoint of the scale (4.00).

**Table 8: UTILITY OF WORKSHOP COMPONENTS**

	1 ... Not at all useful	2	3	4	5	6	7 ... Highly useful	Median Rating
<b>Presentations of prototypes (n=21)</b>	0	0	0	4.8%	14.3%	23.8%	57.1%	6.33
<b>Advisor presentations (n=27)</b>	0	0	3.7%	7.4%	11.1%	22.2%	55.5%	6.19
<b>Work group time (n=23)</b>	0	0	0	8.7%	13.0%	39.1%	39.1%	6.09
<b>Presentation on MOS Universal Design approach (n=24)</b>	0	0	4.2%	4.2%	33.3%	25.0%	33.3%	5.79
<b>Small group brainstorming on prototypes (n=24)</b>	0	0	0	8.3%	29.2%	41.7%	20.8%	5.75
<b>Exhibit tour to review at interactive designs (n=25)</b>	0	0	8.0%	16.0%	12.0%	24.0%	40.0%	5.72
<b>Review of project goals (n=22)</b>	0	4.5%	4.5%	9.1%	18.2%	36.4%	27.3%	5.59
<b>Personas presentation (n=24)</b>	0	4.2%	0	16.7%	25.0%	20.8%	33.3%	5.58
<b>Small group discussions (n=26)</b>	0	0	7.7%	15.4%	19.2%	38.5%	19.2%	5.46
<b>Presentation of Hall of Human Life (n=21)</b>	0	4.8%	14.3%	14.3%	33.3%	23.8%	9.5%	4.86

While the medians are all fairly high, when we asked the participants how they would have changed the agenda, we received a much fuller picture of the workshop.

## Less Sitting, More Hands-On

The majority of the suggestions on how to change the agenda focused on the proportion of presentation time to the amount of prototyping time. As can be seen elsewhere in the report, participants really appreciated both the presentations and the expertise involved, but felt the balance was off. Selected comments include:

*Seemed like more time to work hands-on would have been useful, but the presentations were critical for seeding brainstorm sessions.*

*There was an awful lot of sitting in days one and two; it would have been nice to get up and move or have some kind of interactivity. Enjoyed the creative process, but*



would have liked more time to share and discuss prototypes, with the goal of developing some "best practices" guidelines.

The advisers were extraordinary people and invaluable resources, but two days of presentations was difficult to sit through in spite of the high quality of the presenters. It would have been great to break up that time with other activities and changes of location. I was also surprised, given the purpose of the group, to see so many long and text-heavy PowerPoint presentations. They might have been more engaging if the presenters had been given guidelines--limit length, use abundant visuals, little or no text, etc.

I would have spent more time on creating the prototypes. I did love the presentations, but I loved working with the many different talents of everyone much more. I feel like there wasn't enough time to make good prototypes

Additional days of prototype development may have been even more productive (make Wednesday a full day of team discussion and work).

Needed more prototype time. Spent a lot of time deciding how to approach the prototype and would have liked more time to refine the actual prototype idea.

I think it would have been nice to drive right in and start brain storming ideas right off the bat and stop every once and a while for presentations. It might give participants a bit more time to process what the speakers were talking about and give more time for the ideas to evolve.

One day instead of two for presentations, working into the evening on the first day and doing dinner in the same venue as the workshop, then spending the remaining four days working on prototypes for half the day on Tuesday with half presentations and synching up, then an almost full day on Wednesday with chances of making sure all teams are working in the right direction, then a absolute full day on Thursday, followed by presentations on Friday.

I would probably shift one day from presentations to working on the ideas in the small groups. I probably would also let people bid for or at least express interest in what areas they would like to work in for the prototypes would be useful.

## **Prototyping Process**

Several individuals had suggestions regarding the prototyping process. Reviewing those quotes (below) and other comments on the workshop, participants felt the prototyping did not need to be substantially changed in terms of formal process, but that it does need more advance organizers to help orient those for whom this process is new.

*I think that perhaps the prototyping teams would have benefited from some sort of built-in team building exercise--a chance to meet and get to know one's team members in case there hadn't been earlier in the week. My team said hi-my-name-is and this-is-what-I-do-and-have-expertise-in, and that wasn't quite enough.*

*During the prototype creation and discussions, I thought more formal milestones could have been put in place. I was part of the sonification team and half of our team*



*ended up sitting around while the rest worked hard to create their part of the final. Basically, a little more structured or specific deliverables that everyone could create.*

*Probably have multi-discipline brainstorms AND brainstorms with people in your specific area of experience/practice and then integrate ideas and solutions.*

### ***Small Group Facilitation***

Small group facilitation was one of the lower-ranked components of the workshop (median rating 5.46), though still considerably above the midpoint of 4. Based on the comments (below), participants felt the idea of the small group discussions was good, but that the discussions needed to be more strongly moderated.

*Would have added facilitators to the small-group discussion of the additional scenarios (the current science and technology newsfeed, etc.) and cut a couple of the advisor presentations.*

*More focus on the break out sessions. Sometimes we were a bit confused on what the outcome for the break out session should be.*

*I think that the small group discussions could have been better facilitated - I was in two different groups... one was very productive, while the other had a lot of trouble getting going. Maybe working on something more specific or having a large group discussion first to warm us up.*

### ***Agenda***

As reflected in the ratings in Table 7, some individuals would have appreciated more information in advance. For instance, one commented they would have liked to see the topics of the talks in the printed agenda. Another liked the agenda as it was planned, but wished for more reflection time:

*The agenda was planned perfectly. If there just could have been more time to space things out. There was no time to reflect on things before moving into the next part/subject.*

### ***Including Additional Topics***

Participants fully acknowledged the tight timeframe of the workshop, but some individuals still wished for additional elements to be included. While the number of these comments were few, all of them focused on receiving more Museum of Science context for the workshop.

*Perhaps integrate more field trips into the galleries with the advisor presentations?  
It's hard - because there was so much to cover!*

*It is my understanding that MOS has other access projects in the pilot stage and I was surprised that they were not demonstrated or discussed."*

*Perhaps have the agenda spend more time focusing on the Museum context and give participants more opportunities to see how visitors interact with components on the floor.*



## Level of Engagement

One concern in bringing together a group of individuals with such diverse roles is that some would feel at times isolated or disengaged by the variety of styles and goals of the different workshop components. The majority of participants were highly or fairly engaged throughout the workshop, though there was wide distribution through the scale. Despite comments elsewhere that the advisor presentations need to be reformulated, it was the advisor presentations that had the highest median engagement rating (5.74). Least engaging (but still above the neutral point of 4) were the small group discussions (4.81) and the presentation on the Hall of Human Life (4.59).

**TABLE 9: LEVEL OF ENGAGEMENT**

	1 -- Not at all engaged	2	3	4	5	6	7 -- Highly engaged	Median Rating
Advisor presentations (n=27)	0	0	3.7%	3.7%	25.9%	11.1%	55.6%	5.74
Presentations of prototypes to the larger group	0	4.7%	0	9.5%	4.7%	33.3%	47.6%	5.67
Work group time (n=22)	0	0	0	18.2%	18.2%	40.9%	40.9%	5.64
Exhibit tour to review at interactive designs	0	0	4.2%	16.7%	12.5%	33.3%	33.3%	5.29
Presentation on MOS Universal Design approach	0	0	0	8.0%	28.0%	36.0%	28.0%	5.20
Review of project goals (n=22)	0	0	4.5%	13.6%	31.8%	13.6%	36.4%	5.18
Personas presentation	0	0	0	12.5%	33.3%	29.2%	25.0%	5.04
Small group brainstorming on prototypes (n=23)	0	0	4.3%	8.7%	17.4%	52.2%	17.4%	5.00
Small group discussions (n=27)	0	0	11.1%	14.8%	25.9%	25.9%	22.2%	4.81
Presentation on the Hall of Human Life (n=22)	0	0	18.2%	13.6%	18.2%	36.4%	13.6%	4.59

The comments on why participants were less engaged in particular workshop elements echoed their thoughts on changing the agenda.

### Small Group Facilitation

As indicated in comments elsewhere, participants struggled with the small group time, and felt that stronger facilitation would have helped.



*The small group discussions were helpful, but I think could have been more productive if there was a facilitator to help move us forward since there was a lot to do in a relatively short period of time.*

*More direction on the goal of the small group session.*

*Some advisor presentations did not seem useful, and sometimes I was not engaged in small-group discussion because I did not feel I had the expertise to give input.*

### **Advisor Sessions**

As noted by the high ratings in Table 9, participants felt the advisor sessions were useful, but the presentations were uneven.

*Some of the advisor presentations were excellent and engaging. Others not. I don't really think you had control over that situation.*

*The advisor presentations were great, but some went longer than others. Perhaps a format like PechaKucha presentations (20 slides, 20 seconds each) followed by Q&A could have helped (even though some presentations were so rich and had so much to share).*

### **Exhibit Floor Time Needs More Direction**

Participants would have felt more comfortable with a clearly articulated agenda for the Exhibit floor time, such as the individual who stated:

*I found the exhibit tour a little confusing: some exhibits were clearly universal in design; others didn't seem to be.*

### **Integrating into the Overall Exhibit Design**

As the participant exhibit designers knew, exhibit design is often a multiyear process of building up ideas and content, potential design treatments, and refinement of big ideas. Mixing of relative newcomers plus the mandate to produce universal design treatments in tune with existing exhibit goals was difficult to integrate in a short time frame.

*The presentation on the Hall of Human Life was also a bit confusing: we heard about bits and pieces, but didn't get a sense of overall design and educational goals. Review of project goals was fine, but then didn't really reflect what we were doing: trying to find a way to re-engineer existing multimedia interactives to make them as universally accessible as possible given their complexity and intrinsically fast-paced, visual nature.*

*The HHL presentation confused the process a bit. I liked having a context to design in but it felt somewhat odd to be designing for a specific exhibit when talking about universal design. This was a problem in our small group discussions because we did not know if we were trying to solve the single problem in the exhibit or a much larger issue. In the end I think it worked out, it just was a bit hard to get an idea of what scale we were thinking about.*



*HOHL presentation was not as inspiring, because we were already discussing during the workshop and I felt our end goal would be to develop prototypes that fit the needs of the exhibit, which "closed" our minds a little. Once you know what your designing for you focus in and the big "crazy" ideas may not come out, plus I have no notes written and I assume the group had little time to prepare.*

*I would have liked a little more time to apply our learning in the galleries in the context of what is and/or isn't already in place.*

### **Participant Contribution**

One of the considerations of the workshop organizers was to balance the skills and expertise of the participants so that work could proceed efficiently, but also so that participants would not be sidelined for large portions of the workshop. We asked workshop attendees whether they knew what to do, and whether they felt like they knew what to do to contribute to the process. Three-quarters of the respondents (77.8%) felt like they knew what to do to contribute to the workshop. Further, the majority of respondents felt they could contribute greatly to the small group discussions and the small group brainstorming. Most individuals felt they could contribute to some extent (88.4%) to the work group time.

**Table 10: DID YOU FEEL LIKE YOU KNEW WHAT TO DO TO CONTRIBUTE TO THE WORKSHOP?**

	<b>% of Respondents</b>
<b>Yes</b>	77.8% (n=21)
<b>No</b>	3.7% (n=1)
<b>Not sure</b>	18.5% (n=5)

**Table 11: TO WHAT EXTENT DID YOU FEEL YOU COULD CONTRIBUTE TO THE FOLLOWING WORKSHOP COMPONENTS?**

	<b>I couldn't contribute much</b>	<b>I contributed a little</b>	<b>I contributed greatly</b>	<b>Not applicable</b>
<b>Advisor presentations on the principles of Universal Design (n=27)</b>	18.5%	27.3%	29.6%	29.6%
<b>Small group discussions (n=27)</b>	7.4%	40.7%	51.9%	0.0%
<b>Small group brainstorming on prototypes (n=26)</b>	4.2%	30.7%	57.7%	7.7%
<b>Work group time (n=24)</b>	0	37.5%	45.8%	16.7%
<b>Presentations of prototypes to the larger group (n=24)</b>	8.3%	45.8%	20.8%	25.0%

A natural question after considering whether you are the right person in the room to be contributing is, who are the right people that should be in this room? The participants overwhelming (93%, n=25) felt that the right people with the right expertise were present. The remaining two individuals responded that they were not sure whether or not the right expertise was present.



**Table 12:** WITHIN THE WORKSHOP OVERALL, WERE THE RIGHT PEOPLE WITH THE RIGHT EXPERTISE PRESENT?

	<b>% of Respondents</b>
<b>Yes</b>	92.6% (n=25)
<b>No</b>	0.0% (n=0)
<b>Not sure</b>	7.4% (n=2)

### ***Robustness of the Workshop Model***

A critical element of the post-workshop follow up was to ask participants to reflect on the construction of the workshop, in particular six components. The workshop was based on bringing together elements of design charrettes with rapid prototyping techniques. While not explicitly endorsing a particular strand of product development, the team crafted the workshop based on six components founded on the tenants of a modified rapid application development process. Those six components were:

1. Multidisciplinary expertise among the participants,
2. Presentations to generate a shared background content knowledge,
3. Personas to focus development on a specific target audience
4. Focus on a specific design challenge (for example, a data sonification component for the Hall of Human Life exhibit)
5. Resources to allow design and creation of prototypes (including space, food, tools and supplies), and
6. A clear deadline for prototype development.

As the prototyping workshop model is one of the more tangible aspects of the project, both in practice and as a model, we felt it was important to gather feedback on the elements of the model and suggestions for refinement going forward. The participants varied in their amount of previous experience with development cycles, even within roles. For instance, some of the academics interviewed were quite familiar with the use of personas and rapid design cycle, whereas to others the process was entirely new. Some of the exhibit developers found the workshop process to be highly familiar, if intensified and conducted with a more diverse expertise. Other exhibit designers found aspects of the process less familiar.

Overall the participants felt that the model was robust, and only requires minor alterations for any sort of replication. Most importantly, the model was critical in moving the team forward in progressing towards actual production of the prototypes and the DIY toolkit.

### ***Element 1: Multidisciplinary Expertise Among the Participants***

Attendees agreed that multidisciplinary expertise was critical for this type of undertaking, almost as if it was an assumed layer without which the rest would not be possible. They felt like the workshop offered the needed amount of multidisciplinary expertise, as one individual commented:

*Atmosphere was good, very informal, all the right players were there. It was surprising to see the caliber of the people in the room. This was a rare thing.*





There were one or two comments about how more technical expertise would have been appreciated:

*Very valuable from learning the different disciplines, and the places that people come from. They may have all the same idea and needs, but they are coming at it from different angles, so they may not know that there is that overlap. Plus professional development, of course, context for companies and advisors you may want to seek out. We kept switching tables, I'm kind of shy, so that helped because it became easier to open up and talk with everybody.*

Otherwise, there were almost no comments about the multi-disciplinary expertise.

## ***Element 2: Presentations to Generate a Shared Background Content Knowledge***

Participants felt strongly that the presentations helped generate a shared knowledge and vocabulary, enhancing communications through out the workshop. As previously noted, several individuals wished that the presentations could have been more spread out throughout the workshop to help vary the lecture-type format.

*It was great. I went back and forth on whether it would be helpful to intersperse. It got everyone in the right mindset, and gave everyone the right words to move forward, to come up with ideas for later. I think it was really useful.*

The ability to break down communication boundaries with others was noted in the following comments:

*The connections were big there, that's super valuable. We get caught up in our own bubble, it's difficult to listen to others that may have different experience. It opens us up to seeing those connections. It opens us up to relating to the ways others are working.*

*I'm used to working with exhibit people, and we have our own language, and it takes time if you have to explain that vernacular. It's good to step back and have to explain. It's a little more difficult to navigate the design process.*

*It really helped us to develop the product, but also how we communicate with one another.*

As noted previously, even those that felt the presentations might have been too close to one another appreciated the need for the presentations.

*I found the expert part to be one of the most important pieces. There may have been a way of putting some of the end stuff in between the experts, though I understand we broke it up. Could have been broken up more.*

*It wasn't the most critical point for me. It definitely helps to create a common frame of information; it simplifies the process to have the expertise by notable experts.*



### **Element 3: Personas to Focus Development on a Specific Target Audience**

While participants ultimately found the personas to be highly useful, they were ambivalent about both how they were introduced and were intended to be used within the design process. Of all the elements within the model, this was the element that participants both saw the utility and yet struggled somewhat unevenly with the implementation. As these participants commented:

*At first we went through them really fast, and it felt as though I was missing something. I felt bad about that. In the end, when we were really trying to see who our audience is, it was extremely helpful. Sometimes you think someone has one disability, but they may have several, or there may overlap within a family. It's kind of a puzzle, it's sort of neat. During the presentation of them, I didn't know what they were being used for.*

*At first I didn't really see the point of the personas, it was extremely useful to address a need by a name, you were able to blend more than one point.*

*I think that's another super critical element of development. The more focused and clear the target is, the easier for designers and developers to know what they are designing too. In our field, people are normally described as demographics. With the personas, you could focus on different needs, etc.*

*Yes, I thought that was essential, having a particular clientele in mind you were catering towards, and how to design multiple perspectives. I would be open to using them more.*

*I do personas all the time, somewhat religious. So it seemed rather obvious. They really worked well for us. I think others saw some benefit to using them. That would be a skill that some people carried away with them.*

*It didn't go as deep into that as I was expected in the beginning. I don't know if that was the time and place but I would have liked more. I think part of that was that the time I was leaving, I was there for this big dump of information. It was like this sea that needed to be zeroed on, it was less helpful. I know why it's there, but it may have been better to look at functional requirements rather than personas. For some, those who don't have a functional limitation, less time on personas and more time on functions.*

*They were really helpful, but we kept on forgetting them. We'd bring them up in our group, and we'd then go often on a tangent, but then it felt a little forced at times. It's good for creating constraints for ideas.*

### **Element 4: Focus on a Specific Design Challenge**

There was little commentary that attendees felt they could offer on this particular element, except for the general agreement that it was necessary by the construct of the workshop. As one stated:

*Well, that was important from the standpoint of the strict timetable we had to work with. At the end of the week, we need to have something.*

One individual was thrown by the ambiguous direction:



*I think there was a confusion. A lot of groups changed their focus. I was thrown by people changing there[sic] groups. I don't know I knew the outcome before we started was supposed to be. There were some strong voices in our group, and some communications issues among us. There was a lot of tension, but we wanted the same thing anyway, we had the same idea. We had to change our way of talking to communicate to our group the outcome. We all had the same idea in our heads.*

And finally, one exhibit designer pointed out the difficulty of creating valid and useful interactives when the workshop attendees and the host exhibit designers are at very different places in the process and context of the exhibition design.

*It was a little confining. There were so many other ways you could work on things. That I thought was a little difficult within, it was a little jarring to get into the design process with people who had been immersed in that process from that sort of design. Here's the challenge and have everyone start at square one. I can see the benefit, it was a little strange to be thrown in the middle of their process.*

### **Element 5: Resources to Allow Design and Creation of Prototypes**

While all of the interviewees expressed appreciation for the efforts of the museum in terms of space, food, and other resources to make the workshop happen, some of those interviewed were more accustomed to that effort than others.

*That was really neat. It was kind of like a captain of ship. You kind of just think of it and it goes. Normally as an academic, it doesn't happen that way, that was really cool.*

*It was very critical to have the touchscreens on hand, everything we need. I didn't feel like anything I needed was missing.*

For some, like those below, access to these sorts of resources was unusual:

*Like a workshop should. It wasn't limited to pen and paper. We actually had an opportunity to work with the tech that the museum had to play with. That made it different from every other workshop I've been to, with people prototyping.*

*We have a shop. It made me think of a maker space model. You're given tools, and alright, here's what we need to bring your ideas to life.*

For some exhibit designers, being at some else's space was frustrating.

*Sometimes we had to wait because I couldn't use the equipment without someone from MOS being there, and they would be called away on other work. I understand why, but I use this back at the museum, so it's frustrating to have to wait for someone to have access.*



## ***Element 6: A Clear Deadline for Prototype Development***

Individuals appreciated the hard deadline for the creation of prototypes. As several interviewees noted, it caused participants to be more committed to completion. One individual expressed it this way:

*To have a deadline when anyone is trying to create anything, it's easy to get distracted into thinking without a deadline. It pushes people to think with a purpose, not just in dreamland. You have this task, not just dream things up. It pushes people to think harder, think better.*

Others related it to the design experience (as opposed to the academic experience):

*That makes sure people don't spend too much time talking. For those quick charrette experiences.*

*I think it is necessary. Within the workshop, you need to have a deadline, or we wouldn't have finished. Some of those groups wanted to talk forever. It made the builders and those that could use their hands work quickly, having a goal to reach.*

One individual saw the deadline as not just necessary, but positive:

*I liked it- I like pressure, that whole end of the world thing, inspires a lot of creative, presentations shouldn't matter as much, and more demonstrations going forward.*

## ***Collaboration***

Over three-quarters (88.8%) of the participants stated that they would be very comfortable contacting someone from the workshop to collaborate on a project. When interviewed, individuals had a range of projects to point to as potential collaborations stemming from this project. While some of the potential future collaborations were ones between key project partners that may have collaborated without the workshop, others were new associations and potential projects. Two of the individuals interviewed ended the interview by asking to be kept in mind for any new potential projects, collaborations or grant proposals.

**Table 13:** HOW COMFORTABLE WOULD YOU FEEL CONTACTING SOMEONE YOU MET AT THE WORKSHOP TO WORK ON A PROJECT TOGETHER?

	<b>% of Respondents</b>
<b>Uncomfortable</b>	0.0% (n=0)
<b>Somewhat uncomfortable</b>	0.0% (n=0)
<b>Somewhat comfortable</b>	12.0% (n=3)
<b>Very comfortable</b>	88.0% (n=22)

## ***Level of Comfort with the Process***

As mentioned elsewhere, this workshop has elements that were very common to most, and some elements that were less common for some participants. In addition, it involved participants with accessibility issues, and the goal was to design accessible exhibits. The differing levels of expertise in differing domains meant that no one person would be an expert in all elements needed. One of the tacit goals of the workshop was to push individuals “out of their comfort zone” and to engage in new



thinking. Thus by definition, the workshop had the potential to make participants feel uncomfortable. We asked participants if there were times they felt uncomfortable and if there were times they felt stretched. They responded by telling us that the process was uncomfortable at times, and that they expected it to be. Overall, they stated that the moments of discomfort were a “good” or “productive” discomfort.

*Not to the point where you don't feel the process.*

*The process of designing is uncomfortable at times. In design, you're supposed to be uncomfortable.*

*It's messy. It's supposed to be messy, and you have to sort of accept that is part of the process. I think if you don't know it's supposed to go through a messy part, than it's more disorienting.*

*There are a lot of big personalities; you have to kind of feel out the way to deal with all the different perspectives.*

*The tight timeline puts that too- you can't walk away from a meeting and come back to it next week. We just have to get through it. It probably did make some people feel uncomfortable. With a deadline like that, with people that don't know each other, it's going to get a bit uncomfortable. You just get through that.*

*I never felt way uncomfortable. It's an okay uncomfortable. We're not all getting along here but we're doing good things. There were some people that came in with pre-dispositions. Some people hung onto things more than other people.*

*It moves you forward. Like the whole Vygotsky-Piaget thing. It's part of the process of growth. We should do more of these things, where you're uncomfortable enough to grow.*

*No. There were times were you had the more practical, more business, more get things done and then the no let's test it, what has already been done. That caused some tension, but a good tension, both sides had the same goal but different mindsets to get there. It's a positive tension. Let's figure out a way to get together, and not get caught up in the tension.*

### ***Impact of the Project***

As an interim measure of change towards the larger goal, we asked participants whether the project had an impact on their work. While some of the experts answered that they had been fully immersed in universal design already, others felt they had already implemented changes to their work.

*We're designing some online systems and taking into account learner variability. And now have a better understanding of other considerations that inform learning environments. It helped me by breaking it down into distinct terms. It helped me think through various scenarios and how we might realistically think those out. It helps with process.*

*It helped to focus on projects and efforts that could be done. Sort of filter out what projects, activities, programs and exhibits would be doable. Really depending on the*



*project, with this in mind, this project lends itself to A, B, and C, whereas this other project doesn't. It's easier to identify what's doable.*

We asked participants whether they felt they gained knowledge or skills in creating universally designed multimedia interactives for the science museum environment. Most individuals answered they gained some knowledge about universal design, fewer individuals expressed learning specific skills.

*I think it was more knowledge based than skills. I didn't feel like it was that hands-on to I know how to do some things. Maybe lead to skills later on. Maybe to identify to start to think about these things. There's something new there.*

*Yes, I forget how said it. This is probably an abstract example. Through one method you can build a bridge to get to a starving village. Where the person who wants to get the supplies there. The other approach wants to measure a perfect bridge, that's perfectly measured. While that takes time, the other bridge is built and it works well. When you have a need, you need to respond to the need in a fast and efficient way, rather than getting caught up in the details of that. That was my biggest insight in this process. We can't really waste time or get caught up in details.*

Another key attribute of the workshop to be considered was whether the workshop served as an appropriate and efficient tool with regards to the larger goals of the creation of exemplary, universally designed multimedia and the dissemination of those prototypes and processes. While the process is unfolding, clearly substantial and appropriate progress was made during the workshop. At the beginning of the workshop, participants had expressed that they were uncertain whether the goals of the workshop (creating functioning prototypes) could be achieved. At the end of the workshop, they agreed that the high bar had been met.

### ***Future Work to Be Done***

When asked what else the project should be doing, several people mentioned that they'd like to get more updates on the state of the project. A frequent comment at the end of the phone interviews was "Can you tell me what's going on in the project now?" Others mentioned that they would like some mechanisms to make it easier to collaborate. As one individual said some informal place to bounce ideas around:

*It would be really cool if we could, if there were spaces we could hang out online. Simple as a Facebook group or complex as a project board. One of those things, we keep saying we need to call them, then it goes to the back burner. Getting us all there, locked in the four walls really helped.*

*A lot of things, putting out a paper on the process and the outcomes, that would be helpful. Getting it out to people.*

*There was an effort, all that effort that went into the individual team, the experience. We need a white paper or more formal thing. I think the whole thing is a learning experience. And not every museum will have the funding to do what they did. What are the implications if you are in Portland, or in Chicago and do not have that same*



*funding?*

### **What should be in the DIY---Toolkit?**

We asked participants what should be in the toolkit, including what would help better implementation within the field. In addition to an explicit discussion of the model used for the workshop, participants wanted to make sure that the toolkit was easily relatable for those using it.

*Definitely include the background of the individuals who helped put together the toolkit. Who and what their background was, the background of the toolkit, the multidisciplinary approach towards making it. If anyone comes in contact with the toolkit, they will be able to relate to it. That way it will not just be a research piece, design piece or development piece.*

*Don't worry, we know it's difficult, but here's this to start your progress. First, start with the awareness of UD[universal design] needs. Starting at the why we did all this, the how we did this, how you can do it at your institution with going through a smaller version of this process Answer "How we can do this approach?" You need to make it institutionally friendly.*

## **DISCUSSION**

### **Background on the Concept of a Design Sprint**

In this section, we'll give a quick overview of some of the design practices behind the CMME workshop in order to better reflect on how the workshop and related practices can be best implemented elsewhere within informal science education institutions. The overall goal of the Discussion portion of the report is to make connections between and raise questions about the design of the workshop, the actual product deliverables, and the next steps in implementation.

The CMME workshop was implicitly informed by several theories from the discipline and practice of software design. There is an emerging literature on workshops and other "sprints" similar to the CMME workshop in many regards. Some of these are for software design, others for book design (an example <http://studioforcreativeinquiry.org/projects/ast-book-sprint>), and finally for web redesign within a museum. Google has detailed their process for a design sprint in a series of blog posts. Their process also involves a five-day sprint, and CMME participants might find it very similar. Prior to the sprint, they prepare. The rest of the days follow as such:

**Day 1: Understand** (Dig into the design problem through research, competitive review, and strategy exercises.)

**Day 2: Diverge** (Rapidly develop as many solutions as possible.)

**Day 3: Decide** (Choose the best ideas and hammer out a user story.)

**Day 4: Prototype** (Build something quick and dirty that can be shown to users.)

**Day 5: Validate** (Show the prototype to real humans - in other words, to people outside your company - and learn what works and what doesn't work.)

As Google explicitly states within these blog posts, their process emerged from the IDEO brainstorming process, and the Stanford Design School's approach. Google felt that the IDEO



approach of group brainstorming ended up with many ideas of varying quality but lacked the movement towards implementation.

Each of these approaches is based in a movement called *design thinking*.<sup>1</sup> Design thinking emerges from the need to design for amorphous problems by using empathy, creativity, rational analysis and user feedback for refining. Design thinking aims to be solutions-oriented; a project begins with a defined goal, and then proceeds to work backwards from that stage. While design thinking resembles evaluation, especially formative evaluation, the process and timeline for design thinking as it emerges in these sprints is dramatically quicker than the typical museum process, both in exhibition design and in evaluation. Design thinking does not follow the scientific method, it relies heavily on synthesis and iteration rather than on analysis. In a critique against the lack of deep analysis as to the problems, some feel design thinking perpetuates *solutionism*. Evgeny Morozov defines solutionism as, “Solutionism presumes rather than investigates the problem it is trying to solve, reaching for the answer before the questions have been fully asked.”

A sprint is concentrated periods of work, focused on particular design requirements. Sprints originate within a form of design thinking known as *agile production* (commonly shortened to agile). Agile is a process and workflow for software design that incorporates elements of design thinking with a workflow that generally relies on 1-2 weeks of iterative design cycles. It has been applied in multiple environments, including within museums for both game design and website redesign. The true implementation of the agile software design process includes twelve principles, including how the best development is done face-to-face (<http://agilemanifesto.org/>). Other workflow processes within these environments, from having daily 15-minute standing meetings, with the idea that if meetings are held standing up, they are more focused and to the point. One of the key elements that may differ from a typical museum project is that Agile design frequently has a very empirical approach, the notion that one needs to accept that the problem cannot be fully understood or defined, focusing instead on maximizing the team’s ability to deliver quickly and respond to emerging requirements. Sprints are iterative; each sprint ends with a progress review and demonstration of features thus far achieved.

### ***Model Elements are Robust***

The CMME workshop model as articulated in the six elements described above, was highly successful in conception and largely in execution. Participants felt each of the elements to be integral to the process, but did not feel there were additional elements that were missing. The composition of days could be rebalanced, as many of the participants struggled with the number of presentations within the first few days.

Conceptually, the CMME workshop model is a marriage of data-based research from advisors and experts and design thinking brainstorming with some elements of agile production. While some individuals had experienced the sense of brainstorming or tinkering with prototypes, to others this solutions-oriented format was very new. For instance, the quote on page 21, a participant compares their previous way of design with the model shown at the workshop as two different methods for building a bridge. In their analogy, the village is starving and progress must be made, so a great advantage of the CMME workshop process was to move forward quickly, to deliver a practical

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<sup>1</sup> There are many excellent references on Design Thinking. The Wikipedia entry ([http://en.wikipedia.org/wiki/Design\\_thinking](http://en.wikipedia.org/wiki/Design_thinking)) is strong starting point on some of the main components.





concept. This clearly articulates a shift from analysis mode to a more empirical thinking as described in the design thinking section above; focusing on delivering quickly and responding to requirements.

### ***The Why Behind the Workshop Design***

As discussed above, participants felt comfortable being stretched, but at times a better understanding of the process could have increased their understanding. One participant discussed the inherent messiness of the process, and commented that not everyone may have understood design and prototyping to be messy. Understanding a typical sprint process, including the obstacles, may have helped many participants feel more comfortable with the process. Seen through that lens, the participants' confusion and ultimate embrace of the use of personas makes more sense.

One participant stated in the telephone interviews that they only have one persona, that of the typical visitor, at his/her museum. This lack of understanding of how multiple different personas may help both define and humanize design challenges from (showing a solutions-orientation perspective) indicates this individual was unable to effectively utilize personas within further their universal design work.

### ***Integration within the Exhibition Design Process***

Viewing the CMME workshop with the understanding that the workshop itself was successful in achieving the stated goals (prototypes were created, and collaborations created), the next step is articulating how this process becomes integrated within a design process. Knowing that exhibition design is not only “messy” in the words of one of the participants, but a process sometimes lasting years, how should an institution incorporate the elements of the workshop within their overall design process? Does CMME intend this type of workshop to be an iterative process for exhibit teams? Could a mini-version of the workshop be formed now that some shared universal design expertise and vocabulary has been developed? Could a mini-version be used to create other needed universally designed elements for the Hall of Human Life or other exhibits? If so, how would these workshops fit within the design process?

During the workshop, one of the participants mentioned that this was somewhat backwards from the typical exhibit design process. Customarily, content is central. One first brings together all the content, and then tries to design creative strategies for engaging audiences with the content (hopefully in a deep, meaningful, and enjoyable fashion). Within the workshop this person commented that participants arrived at the design solutions in a manner semi-independent of the content as well as the plans for the rest of the exhibit. If the main goal is to give the exhibit designers tools, processes and potential solutions, then perhaps a single workshop, independent of a particular exhibit, is enough. If the CMME team believes this workshop produces higher quality solutions by being in this format, than perhaps the workshop format needs to be incorporated within the design process.

### ***Replication in Other Institutions***

Finally, the CMME project team should consider how to present these findings in other institutions. If an institution desires to create more universally designed multimedia exhibits for their visitors, is it enough to borrow these solutions? Or do they need to go through a similar process as the CMME workshop. After they have gone through this period of heightened awareness, how do they maintain momentum? Are there ways the DIY toolkit can encourage and support participants from museums (such as at the Franklin, OMSI, Balboa Park) in sharing their experiences and tools with the rest of



their home institution?

## CONCLUSIONS AND RECOMMENDATIONS

The CMME workshop was highly successful in design and implementation. There were several elements that should be refined if the workshop model goes forward, but at a conceptual level all of the right elements were within the workshop itself. The length of the workshop, the amount of informal networking, the balance of individuals, the level of effort to accommodate disabilities, and the resources available were all deeply appreciated by the participants and helped contribute to the success of the workshop. Individuals felt they gained knowledge about universal design, especially within the context of designing multimedia for science museum environments.

In addition to being successful in of itself, the workshop contributed strongly to the success of the next stage of the project, the production of the exemplar designs for universally designed multimedia and the toolkit for creating universally-designed multimedia.

In analyzing the results from the conference, we have developed a number of recommendations.

### ***Recommendations***

- Reach out to all participants with a more detailed email update on progress, timeline, and next steps.
- Enable a comments section on the blog, an email list-serve or some other informal communications format, so that participants can share ideas with one another without committing to a phone call with a particular agenda.
- Initiate a discussion within the team about how the CMME process fits into the larger cycles of both exhibit design and institutional change.
- Blog explicitly about the different approaches to fitting universal design within the exhibit design cycle.
- Be clear within the DIY toolkit about where and how to apply the products, such as the exemplars, and the process, as demonstrated by the CMME workshop.
- Give background within the DIY toolkit that connects the process to exhibit and software design, so that potential readers from any direction understand the key elements and contributions to the process.

### **Conference Specific Recommendations:**

- Distribute a more detailed agenda in advance.
- At the workshop, present an overview of the type of workshop, as participants may not be familiar with this style. Allow them to know what the typical stages are, what other settings this is used in, and that the process can be messy.
- Consider rebalancing the format and amount of advisor presentations. While PechaKucha-style presentations are difficult to put together well, they effectively limit the amount of time on any one topic, and force presenters to focus.
- Guide experts to present specifically on accessibility needs and research, rather than on the



type of work their organization does.

- Consider placing an exhibit tour earlier in the workshop, so as to break up the amount of lecture-style time.
- Introduce stronger facilitation and goals for the small groups, or do away with them in favor of other agenda items.
- Give participants an overview of what personas are and how they can be used within a sprint. Include the personas within the agenda, so attendees can get comfortable with the personas early.



## APPENDIX A: INSTRUMENTS<sup>2</sup>

### *Pre Workshop Web Survey*

Welcome! This is a short survey for the Museum of Science prototyping workshop. While I'll be working with you throughout the duration of the workshop here and afterwards, I'd like to get some of your initial thoughts as we are beginning. This survey should only take a few minutes to fill out.

1. In your own words, what are goals for this workshop?
2. Do you have individual goals that you hope to achieve while at this workshop?  
Yes    No    Not Sure
3. If yes, what are those goals?
4. How prepared do you feel to participate in the workshop? (1-7 Scale, with 1=Highly Unprepared, 4=Neither Prepared or Unprepared and 7=Highly Prepared).
5. How likely is it that you will meet new partners to collaborate with at this workshop? (1-7 Scale, with 1=Highly Likely, 4=Neither Likely or Unlikely and 7=Highly Likely).
6. Are there any concerns you have going into this workshop?
7. Please rank your current knowledge on the following items:

	1 -- I know almost nothing	2	3	4	5	6	7 -- I'm an expert
Digital interactive designs for science museums that are inclusive of people with disabilities							
How people with a broad range of disabilities interact with digitally-based interactives in a science museum							

<sup>2</sup> Note: Due to the transfer from the web surveys, formatting in all instruments will differ slightly from the original version.



8. How would you rate your skills on the following items:

	<b>1 - I've had no experience in this area</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7 - I'm an expert</b>
<b>Skills related to the design and development of digital interactives inclusive of people with disabilities</b>							
<b>Capacity to work with people with disabilities to design and develop new exhibits</b>							

Comments:



## Post Workshop Web Survey

Hello. This is a follow-up survey for the Creating Museum Media for Everyone workshop held at the Museum of Science this past May 21-25. While the workshop was the critical moment in helping define potential prototypes, it is your thoughts on the workshop process that will help us understand how to foster innovation in universal design within the exhibits field.

The survey should take approximately 15 minutes to complete. All surveys will be confidential. Please return the survey by Thursday, June 14th.

Just we appreciate your participation at the workshop, we deeply appreciate your time and effort with this survey. Your thoughts here will be critical in helping us move forward with this project.

1. Please rate the quality of each of the following workshop elements:

	1 - Poor	2	3	4	5	6	7 - Excellent
Advance information on workshop logistics		.				.	
Advance information on workshop agenda	.	.	.	.	.		.
Accommodation of special needs for the workshop	.	.	.	.	.	.	.
General workshop facilitation	.	.		.	.		
Workshop materials			.	.		.	.
Meals and lodging	.	.	.			.	.

Comments:

2. On a scale of one to seven, how useful was each of the following workshop components?

	1 - Not at all useful	2	3	4	5	6	7 - Highly useful
Advisor presentations				.	.	.	.
Small group discussions			.	.	.	.	.
Personas presentation	.						.
Presentation on MOS Universal Design approach	.	.	.	.	.	.	.
Exhibit tour to review at interactive designs	.	.	.	.	.	.	.
Small group brainstorming on prototypes				.	.	.	.
Presentation of Hall of Human Life	.		.	.		.	
Review of project goals							
Work group time			.	.		.	.
Presentations of prototypes	.	.					

Comments:

.



3. Reflecting back now, would you have changed the agenda in any way?

4. Was the overall length of the workshop too long, too short, or about right?

- Too long
- Too short
- About right

Comments:

5. Did the workshop have enough informal networking time?

- Much less time
- Somewhat less time
- About the right amount of time
- Somewhat more time
- Much more time

6. On a scale of one to seven, how engaged were you in each of the following workshop components?

	1 - Not at all engaged	2	3	4	5	6	7 - Highly engaged
Advisor presentations							
Small group discussions	.			.		.	.
Personas presentation						.	.
Presentation on MOS Universal Design approach							
Exhibit tour to review at interactive designs							
Small group brainstorming on prototypes							
Presentation on the Hall of Human Life	.	.	.		.	.	.
Review of project goals	.	.					
Work group time	.	.					.
Presentations of prototypes to the larger group	.	.	.			.	.

7. If there were components where you were not engaged, please explain why you felt unengaged and if there was a way for you to be more engaged.



8. Please describe what you feel was your primary role at the workshop.

9. Did you feel like you knew what to do to contribute to the workshop?

Yes No Not sure

10. To what extent did you feel you could contribute to the following workshop components:

	I couldn't contribute much	I contributed a little	I contributed greatly	Not applicable
Advisor presentations on the principles of Universal Design				.
Small group discussions		.	.	
Small group brainstorming on prototypes		.	.	.
Work group time		.		.
Presentations of prototypes to the larger group	.	.		

Comments:

11. Within the workshop overall, were the right people with the right expertise present?

Yes No Not Sure

12. If you would have added expertise in one area, what sort of expertise was needed?

13. What elements of the preparation and workshop most helped collaboration during the workshop?

14. What worked well in the process for the prototype work groups?

15. What would you change in the process for future prototype work groups?

16. Now that the workshop was over, from your perspective do you feel the workshop accomplished the stated goals?

17. How comfortable would you feel contacting someone you met at the workshop to work on a project together?

Uncomfortable Somewhat uncomfortable Somewhat Comfortable Very Comfortable

18. Have you formed any collaborations based on your participation in this workshop? If yes, please describe.

19. What, if any, role do you feel you play now that the workshop is over?

20. What sort of next steps do you think the CMME team needs to take?

Thank you so much taking the time to give us your thoughts and advice.





## ***Follow---up Telephone Interview***

Date:

Interviewee:

1. Now that some time has passed since the workshop, how have you reflected on the project since then?

### The Impacts of the Workshop

2. Do you feel you gained any greater understanding of how people with a broad range of abilities and disabilities interact with digitally-based interactives in a science museum environment?

a. If yes, Can you cite any examples?

b. If no, is there any way that the workshop could have structured differently to benefit your skills development?

3. In what ways if at all has the workshop changed your thoughts on how easy or how difficult it would be to design inclusive digitally-based interactives in a science museum environment?

4. Do you feel that you gained any skills in developing digital interactives that are inclusive change through participating in the workshop?

a. If yes, in what way?

b. If no, is there any way that the workshop could have structured differently to benefit your skills development?

### The Workshop Model

I'd like to focus the next on the model of the workshop. The project team designed the workshop to include:

- multidisciplinary expertise among the participants,
- presentations to generate a shared background content knowledge,
- personas to focus development on a specific target audience
- focus on a specific design challenge (i.e. data sonification in the HHL exhibit)
- resources to allow design and creation of prototypes (including space, food, tools and supplies), and
- a clear deadline for prototype development.

5. Part of the deliverables will be to describe this model, both in an idealized sense, and as we experienced it as a team. Can you comment about each of these components in terms of their value for the overall process:

— multidisciplinary expertise among the participants

— presentations to generate a shared background content knowledge

— personas to focus development on a specific target audience



- focus on a specific design challenge (i.e. data sonification in the HHL exhibit)
  - resources to allow design and creation of prototypes (including space, food, tools and supplies)
  - a clear deadline for prototype development
6. Do you feel you could be an advocate for this model of creating universally-designed multimedia? Why or why not?
  7. If you were recommending the process that we went through to other professionals, how would you change or tweak that?
  8. Is the prototyping process, in the ideal form the project modeled something that would be feasible for your institution in developing new prototype?
  9. Were there any moments during the workshop where you felt uncomfortable?
  10. Were there any specific moments where you gained a key insight?
  11. Where there any moments you felt stretched, in terms of your knowledge, skills or otherwise?
  12. Part of CMME is to develop both a DIY toolkit and research papers for universal design in science museum interactives?
    - a. What would be most useful to include within those items for the field?
    - b. What can we do to better achieve implementation?

Key Lessons:

13. Were there thoughts or insights about the workshop that you've since shared with colleagues?
14. What do the rest of your colleagues still need to understand about Universal Design?

