

MEMORANDUM

To: Alliance for Immersion in Museums (AIM) team (Tim Porter, Bobbie Oakley, Mike Horvath, Becki Kipling, Ben Wilson)

From: Sarah Lukowski, Sunewan Paneto, and Elizabeth Kunz Kollmann

Date: September 2025

Subject: Summary of Data from the AIM Professional and Public Evaluations



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Background Information

In Fall 2023, The Museum of Science, Boston (MOS) received a National Leadership Grant from the Institute of Museum and Library Services (IMLS) titled *AIM: Alliance for Immersion in Museums*. This project built the foundation for a coalition of museums and media producers from across the United States, all working together to address current topics of relevance to our communities via immersive digital experiences in museum settings. In the proposed project, a nascent group of coalition members shared best practices, developed standards, identified effective interaction modalities for experiences, and documented strategies for sharing media and content between museums; all in the interest of making immersive digital experiences of the highest quality more widely available in museums across the United States.

This memo shares the findings from the evaluations conducted as a part of the AIM project. There were two main evaluations:

1. A professional evaluation sought to understand the current state of the museum field in terms of developing digital immersive exhibit spaces as well as the design principles that museum professionals think are most important to include in these spaces.
2. A public evaluation where Museum of Science, Boston (MOS) visitors were asked to use two digitally immersive exhibit spaces and report on what made the spaces immersive, interactive, and accessible.

Further information and findings are shared in the sections below.

1. Professional Evaluation

The evaluation of professionals was composed of two sub studies. First, evaluators conducted a field-wide survey of museum professionals and those creating digital immersive exhibit spaces to understand the current state of the field. Then, evaluators conducted focus groups with a subset of these participants to get further information through qualitative data. The methods and findings for this work are described in the following sections.

1.1 Professional Survey

1.1.1 Method and Participants:

A survey sought to gather feedback from professionals in the museum field on:

1. Design principles that guide the development of digitally immersive exhibit spaces
2. Where professionals were at, individually and institutionally, in developing digitally immersive exhibit spaces, and
3. The types of digitally immersive experiences that museum professionals are more interested in installing at their sites, and whether they see themselves as producers or consumers of such experiences

The survey was distributed to museum professionals in several ways, including:

1. Emails to professionals who had signed up as interested in learning more and providing feedback to the Alliance for Immersion in Museums at IAAPA and other previous conferences
2. Emails to professionals who had signed up for a pre-conference intensive at ASTC led by the Alliance for Immersion in Museums
3. A post in the Open Forum part of the American Alliance of Museums website, inviting forum participants to complete the survey
4. Posts by Alliance for Immersion in Museums leaders from Museum of Science on LinkedIn
5. Direct emails to contacts within the museum field by Alliance for Immersion in Museum leaders

In total, 56 individuals completed or partially completed the survey in Spring 2024. While the target audience of the survey was museum professionals working in museums, professionals in aligned fields completed the survey as well, such as external museum consultants and professionals working at design firms that produce multimedia experiences or that sell products that can be installed in digitally immersive experiences. Thus, participant backgrounds were described as following:

- 42 individuals that work in museums
 - 22 Science Museum/Technology Center or Natural History Museum

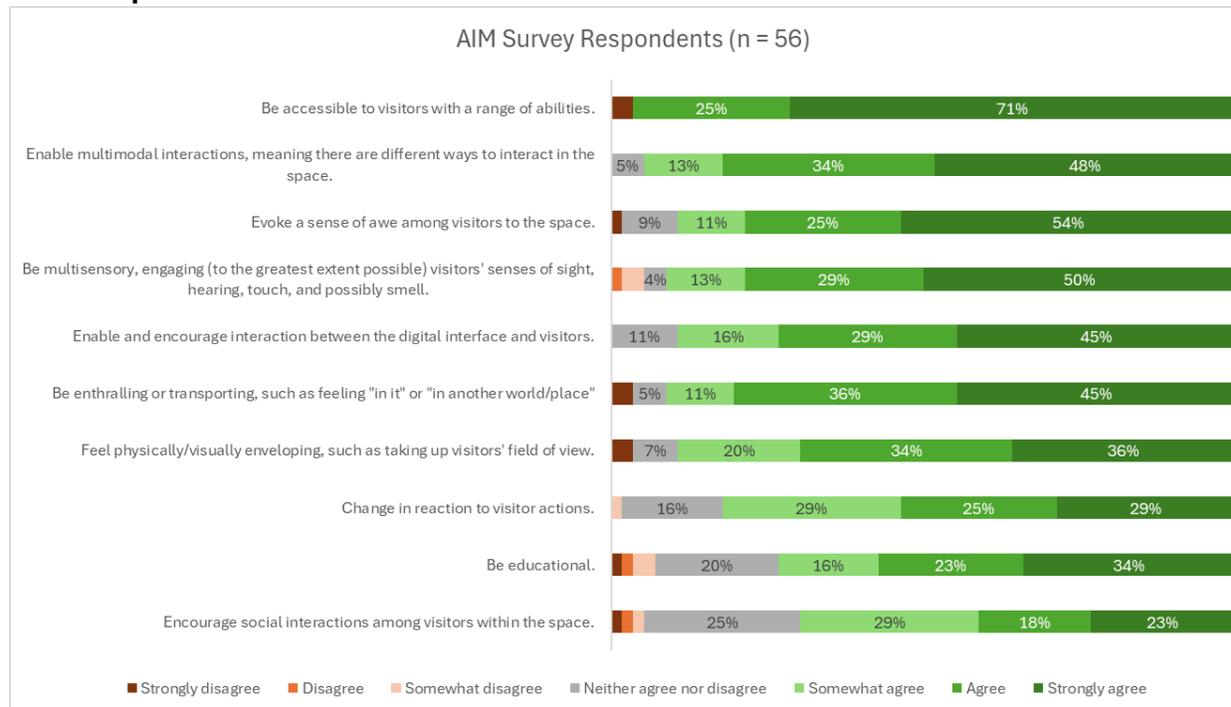
- 5 Children’s Museum
- 4 History Museum
- 3 Zoo/Aquarium
- 8 Other type of museum/special content focus
- 7 individuals that work as consultants in museums
 - 3 individuals that work in the multimedia production industry
 - 1 individual that identified as ‘academic’
 - 1 individual that identified as ‘retired from museum & museum studies faculty’
 - 2 individuals that did not share their professional background

A copy of the survey can be seen in Appendix 1.

1.1.2 Results and Discussion:

Alliance for Immersion in Museum partners had generated several possible design principles for digitally immersive exhibit spaces through ongoing discussions that occurred Fall 2023 – Spring 2024. The professional survey asked for feedback on these principles to ascertain if the design principles had consensus beyond the partner group. Professionals were asked to rate design principles on a 7-point Likert scale that ranged from strongly disagree to strongly agree. Results of the ratings of the survey respondents are displayed in Figure 1.

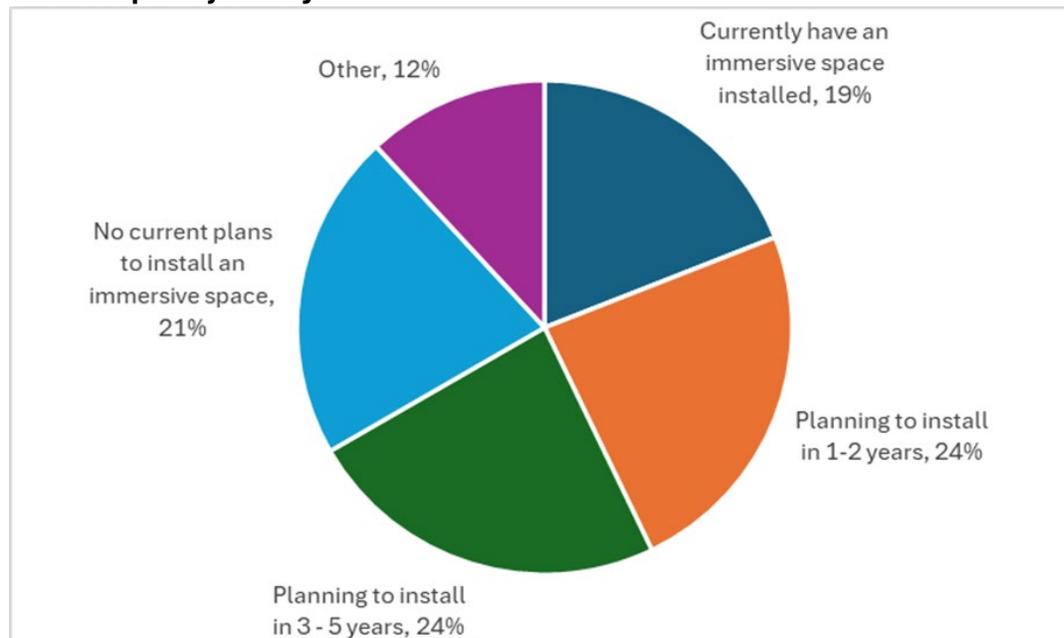
Figure 1. Professional responses to possible design principles of digitally immersive exhibit spaces



Overall, all design principles generated in brainstorming had high levels of agreement within the professional cohort, though no design principle was unanimous in agreement across professionals. Figure 1 is arranged from the highest level to the lowest level of agreement. At the top is accessibility, multimodal interactions, and a sense of awe. Whereas lower on the list is responsiveness to visitor actions, educational experiences, and social interactions. This was of interest because responsiveness, agency, and educational/social experiences may be of higher interest to visitors. Even though professionals generally agree, they may not have the same priorities as visitors. For example, we know from prior data that visitors often come to museums to spend time with their group, for fun or entertainment for themselves and their children, and for an educational experience for their children. Thus, these results gave us initial insight into the priorities of professionals that we could later compare to the public when we conducted evaluation with museum visitors.

The survey also asked museum professionals to assess where their institution was at on their journey of considering digitally immersive exhibit spaces. These results are in Figure 2. The survey data suggested that 43% of museum respondents thought their institution would do something digitally immersive before 2026.

Figure 2. Where museum professionals (n = 42) are at in their digital immersive exhibit space journey



Note. Other = interested but not sure how it would balance against other mission-driven work in budget (3), looking to retool current theater space (1), had an immersive space but removed it (1)

We also asked questions about how they would get to a digitally immersive exhibit space – whether it was something they imagined producing in-house or consuming from somewhere else. 45% of museum professionals thought they would produce something, 21% said they would look to find a digitally immersive exhibit space produced elsewhere. Another quarter of respondents were interested but had no firm plans, which we labeled as ‘curious,’ and only 5% said they would not be interested in producing or consuming digitally immersive exhibit spaces.

Professionals, who said that they were planning to produce or consume a digitally immersive exhibit space, were asked what kind of room they would want to produce or install. The responses to this question were the following:

- 13 out of 30 (43%) imagined a full immersive room (4 walls or 3 walls + 1 floor or more)
- 5 out of 30 (17%) imagined a three-plane experience (3 walls, or 2 walls + 1 floor)
- 3 out of 30 (10%) imagined a one-plane experience (1 wall or floor)
- 7 out of 30 (23%) were unsure
- 2 had other specific configurations (LED dome, round theater)

The ambition of museum professionals was to get to the full room experience, or at least a corner model, with 60% of folks choosing those sorts of exhibit spaces.

1.2 Professional Focus Groups

1.2.1 Method and Participants:

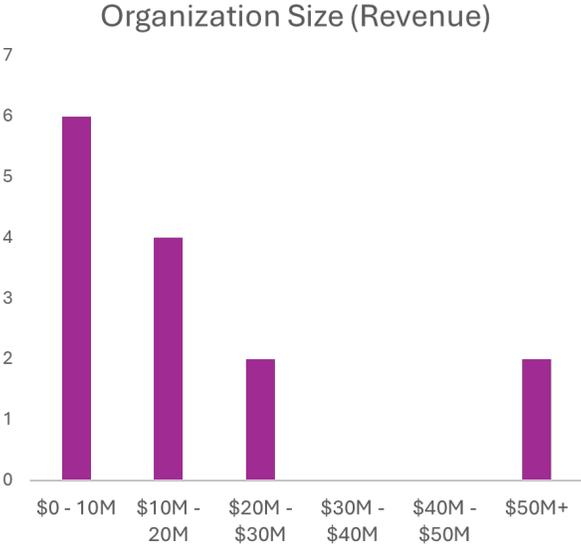
Professionals that completed the survey and provided follow up contact information as well as partners of the Alliance for Immersion beyond the Museum of Science, Boston were invited to further explore digitally immersive exhibit spaces in an hour-long focus group. Research & Evaluation staff at Museum of Science, Boston conducted 5 sessions with professionals between February – March 2025. These focus groups had three main sections:

1. Identifying models for digitally immersive exhibit spaces that professionals are most interested in, and the benefits and challenges of different digitally immersive exhibit spaces
2. Discussing the shareability of digitally immersive exhibit spaces and if these spaces are desired more as an installation in a permanent exhibition or in temporary exhibition space, and
3. Discussing the future of the Alliance for Immersion in Museums, and what benefits or challenges professionals see in participating in such an organization in the future

Fifteen professionals from 14 institutions spread across the US and Canada participated in the focus groups. About half were current AIM partners and half were from other institutions. At least 12 participants worked in an experience development role, with 3 participants in leadership roles that intersected with experience development. Figure 3 shows the types of organizations that were represented by the professionals that attended the focus groups.

A copy of the focus group script can be found in Appendix 2.

Figure 3. Size of organizations of professionals that participated in the focus group phase of the evaluation, based on 2023 IRS 990



Similar to the professional survey, we wanted to understand where these professionals and their organizations were at in their journey towards installing digitally immersive exhibit spaces. We found:

- 4 institutions with a digitally immersive currently installed (two in immersive rooms, one in a converted IMAX space, one as a two-wall experience)
- 4 institutions with plans in the works to install a digital immersive space (though not necessarily in the next year)
- 5 institutions with interest but no current concrete plans
- 1 institution that had a digital immersive space but removed it

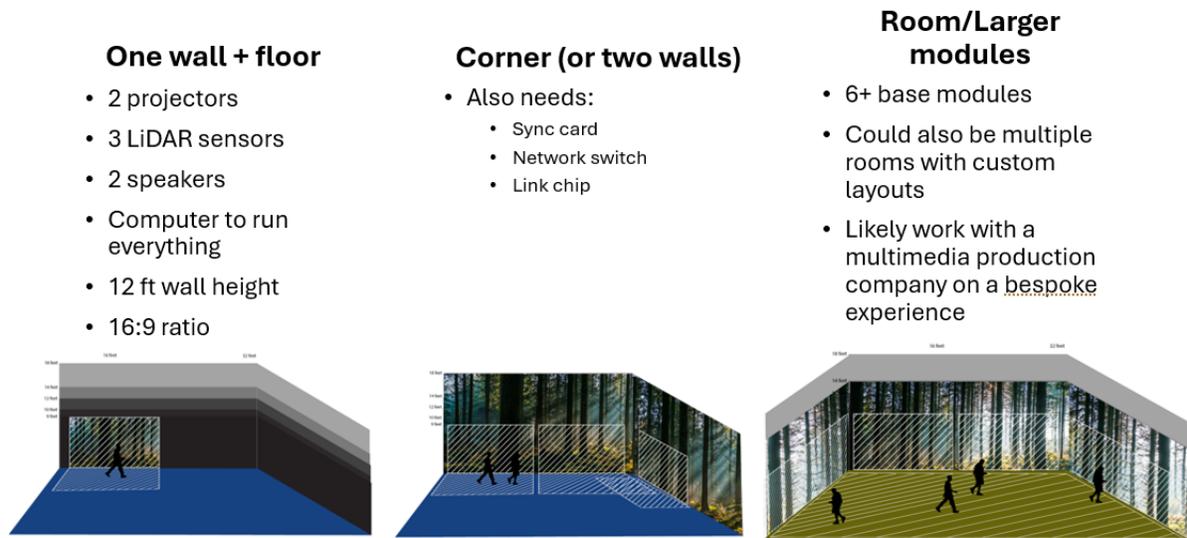
1.2.2 Results and Discussion:

We asked the professionals to reflect on different types of digitally immersive exhibit spaces that had been generated through discussion with multimedia production consultants in January 2025. This helped us to understand if the models generated in this

discussion resonated with a wider array of museum professionals. A screenshot of the prompting image behind that discussion is shown in Figure 4.

Figure 4. Possible modules of digitally immersive exhibit spaces shown to professionals in the focus group discussions

Producing Digitally Immersive Exhibit Spaces



The vast majority of focus groups participants were interested in installing a one wall + floor experience at a minimum. This was seen as a reasonable starting place for museum professionals who had not yet installed a digitally immersive exhibit space, and a way to expand and try something new for sites who did already have a digitally immersive exhibit space among their offerings. Over half of the focus groups also expressed interest in the full room module, or had already installed an immersive room at their site. A smaller subset were interested in the corner model. Professionals generally thought that more walls and floors that were part of the projected digitally immersive exhibit space might correlate with greater feelings of immersion. Some components of these models that were particularly attractive to museum professionals included:

- All spaces as drawn support group interactions (6)
- Museums could activate a space that doesn't get used all the time (4)
- The full room model builds out a whole environment where you can interact with different elements on the walls using gesture and full body gross motor movement (4)

However, there also were a number of challenges identified in the focus group conversation, including:

- Content that is compelling with an interaction that makes sense (6)
- Cost (4)
- Odd wall shapes/textures, door placement mid-wall (3)
- Visitors quickly dirty (and even break) the walls (3)
- Battling against dust in the projectors (3)
- Accessibility (3)
- Concrete pillars (2)
- Working around emergency egress (2)
- How locked in are the aspect ratios? / Scaling Issues (2)
- When a whole immersive room is down it is noticeable (2)

Several of these challenges appeared to fall under broader categories of architectural/structural issues in installing a digitally immersive exhibit space and the cost of installing and upkeeping such a space.

We next sought feedback from the focus group participants on the types of spaces they see digitally immersive exhibit spaces being installed at their institution. One advantage of digitally immersive exhibit spaces that share similar technical standards is that content might be able to be changed out quickly. However, museums may seek to use digitally immersive exhibit spaces primarily within permanent exhibitions, where they may not be seeking to change the gallery often. Figure 5 shows the slide used within the focus group to introduce the concept of traveling exhibits vs purchase of base module to support digitally immersive infrastructure at museum sites.

Figure 5. Slide presented to focus group participants to discuss how digitally immersive exhibit spaces might fit into temporary and/or permanent galleries

Sharing Digitally Immersive Exhibit Spaces

The traveling exhibit model

- The digital immersive experience, including technical equipment, digital files, and installation technicians would be loaned to your institution
 - Your institution would have to have a space that matches the dimensions of the experience that is traveling (or work that out with the loan)
 - Is installed in temporary exhibit space

The base equipment model

- Your institution would pay for and install the base equipment (e.g. 2 projectors, 3 LiDAR sensors, 2 speakers, computer) in a room that would fit the technical specifications shared across institutions
 - Potentially more buy-in up front
 - Your institution could license digital files that fit the system specifications from other organizations, some may be available open access
 - Could potentially change the experience more frequently

All museum professionals were interested in installing digitally immersive exhibit spaces within their permanent exhibit spaces. Therefore, most were interested in the base equipment model. A few themes emerged in favor of this base equipment model. First, several professionals expressed that their museums were phasing out travelling exhibitions at our institution in favor of expanding permanent galleries. Thus, holding space for traveling/changing digitally immersive exhibit spaces was not in alignment with this move towards more permanent gallery space. Second, the groups expressed many concerns about content and fit of content to their space. Even though the majority of participants worked in science/natural history centers, they felt that their methods for interpretation and knowledge of their aesthetic and visitors might be compromised if they only use externally produced digitally immersive exhibit spaces. Therefore, what museum professionals really wanted were the tools and expertise to begin to create their own digitally immersive exhibit spaces.

About a third of the group was open to the possibility of digitally immersive exhibit spaces taking place in a traveling exhibit framework. Here, focus group participants stressed that if it's traveling then the experience should be a 'blockbuster' consistent with the draw of other traveling exhibitions. Museum professionals were also open to exploring a library of content that we could change over rapidly for seasonal reasons, special public programming events, or to augment a space – that is, for museums that currently have under-utilized spaces within their museum footprint, traveling digitally immersive spaces might be able to fill a gap.

The team at Museum of Science estimated that the total cost of base equipment for a one wall-one floor experience would be in the range of about \$50,000 USD. This cost could be

more or less depending on the types of projectors installed in the space, and any architectural issues that would need to be resolved. We asked focus group participants about this price range, and how prohibitive it would be to entering the market for producing digitally immersive exhibit spaces internally at their site. For about 85% of institutions, this price tag alone was not prohibitive. However, many sites would need to know more before making such an investment. Common themes of what sort of information would make professionals more confident in making an investment included:

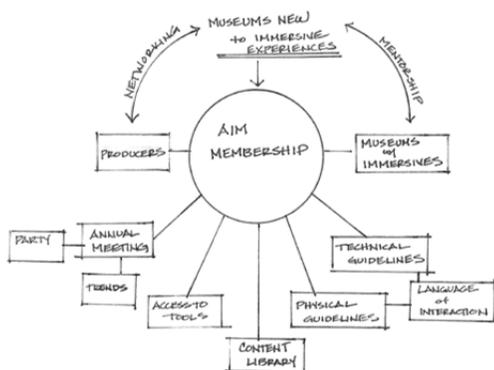
- Evaluation data on the impact of digitally immersive experiences on visitors
- Information about the content that is already available or could be created
- Information about equipment maintenance, including how often equipment needs to be replaced and degradation of digital content over time
- Can the space and content available have more than one purpose (and funding stream)

Finally, we presented some models about what could be included in the future of an Alliance for Immersion in Museums, and how such an Alliance could best support museums beyond the grant period. Figure 6 shows some models of AIM for museums that were presented to the focus groups.

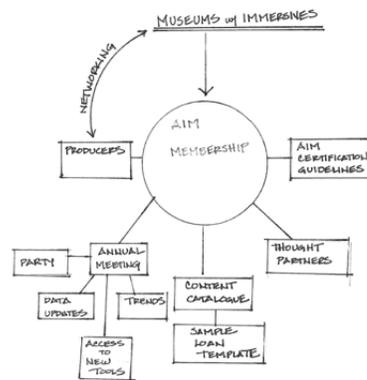
Figure 6. Slide presented to focus group participants on possible benefits of a future membership model for the Alliance for Immersion in Museums

What can an Alliance for Immersion in Museums do for you?

Museums that do not yet have a digitally immersive space installed



Museums that DO have a digitally immersive space installed



Key benefits to joining the Alliance for Immersion in Museums included:

- Networking with other professionals

- Technical guidelines and tools for development
- Knowing that a product has been vetted/certified
- Access to a content library

Museum professionals also identified several additional benefits of an ongoing Alliance that the team should consider:

- Could there be an agreement with multimedia producers? Like if you produce something for one institution, that institution gets a discount because the producer can make an 'AIM' version that is licensable too?
- Reduced cost for access to the content library if you are a member
- Reduced cost for members to visit other museums with digitally immersive exhibit spaces installed so members can learn from other sites
- Pursuing outside funding so that more AIM sites can have evaluation data on their products
- Could we have 3-4 basic form factors that together make a toolbox that others can work from? What do we need to do so that the software for the interaction isn't a black box?
- Inclusion of folks outside the science museum and multimedia production world, like artists

In terms of funding an Alliance for Immersion in Museums beyond the grant period, museum professionals were split with approximately half interested in an individual membership model (where access to the Alliance would be comparable to individual members to other professional organizations, generally in the ~\$150 range). The other half of the group were open to the idea of institutional pricing (where access to the Alliance would be comparable to institutional pricing for other professional organizations, generally dependent on museum size and potentially in the \$1000s range). Cost to join Alliance for Immersion in Museums, and the time and cost of staff in attending Alliance for Immersion in Museum meetings (even if only virtual) were barriers to future participation beyond the grant period. Some professionals also expressed that while they were interested in digitally immersive exhibit spaces, making such an investment at this time on Alliance participation would be dependent on buy-in from higher levels of leadership at their organizations.

In summary, the focus groups supported the following conclusions:

- Most museums are just at the start of their journey of using digital immersive exhibit spaces
- Full room is a long-term plan for many institutions (like 5 – 10 years), but in the next 5 years many see a one wall-one floor module as feasible
- Professionals want the skills to put digitally immersive exhibit spaces in their own permanent galleries

- Because permanent exhibits are preferred, the value of changeability may be more limited
- Lots of healthy skepticism as to if the content/interaction that meets site needs could be developed externally
- Most value networking with other museums, and setting up a community of practice for experience development staff

2. Public Observations and Interviews

Visitors to the Museum of Science, Boston were invited to give feedback on digitally immersive exhibit spaces. The core purpose of the public evaluation was to document “to what extent members of the public felt that the immersive experience reflects key design criteria (immersive, interactive, accessible).”

2.1 Method and Participants:

Visitors were recruited in groups from the museum floor from one of four exhibitions that contained a digitally immersive component between November 2024 and August 2025; these exhibitions and their digital immersive exhibit spaces are summarized in Table 1.

Table 1: Digitally Immersive Exhibit Components

<i>Exhibition</i>	<i>Exhibit Component</i>	<i>Photo</i>	<i>Key Attributes</i>
Exploring AI: Making the Invisible Visible	DALL-E		One wall + one floor version; visitors make selections on the floor to create artwork and then add to gallery by selecting on wall among options generated by DALL-E
Innovation: Earth	Sustainable City		Three walls + floor; visitors make selections among possible choices that make cities sustainable, the wall then shows changes to the city in response to their choice
All Aboard! Trains at Science Park	Virtual Conductor		Corner model with 2 walls; kiosk where visitors can control the video of the train moving on the tracks
Perception Playground	Vection		Corner mode with 2 walls; spot on the floor indicates where to stand for maximum effect but there is no other interactivity, visitors feel motion

Each group that agreed to participate was asked to visit two of the four exhibitions that contained digitally immersive exhibit spaces. The evaluator observed groups as they were in the exhibit spaces, encouraging groups to stay as long or a little as they wanted. When the group was done with each exhibition they were asked questions about their experience in the space and elements of digital immersion, interactivity, and accessibility. Groups also completed a demographic survey so we could understand the range of visitors that provided feedback. The full data collection instrument can be seen in Appendix 3.

2.2 Results and Discussion:

Overall, 31 groups participated in the evaluation. 55% of groups that participated in giving feedback on their museum experience were adults and children, and 45% of groups contained adults only. They visited the following experiences, as shown in Table 2. Two groups ended their participation after one exhibition.

Table 2. Group visits to exhibitions with a digitally immersive exhibit space

<i>Exhibition</i>	<i>Number of groups</i>
Exploring AI: Making the Invisible Visible	21
Innovation: Earth	10
All Aboard! Trains at Science Park	13
Perception Playground	16

Visitors were in alignment with MOS staff in identifying which experiences in the exhibitions were “very digitally immersive”. Below are the exhibit components that they rated highest for digital immersions in each exhibition:

- All Aboard! Trains at Science Park – Train Conductor (11 of 13 groups)
- Innovation: Earth – Sustainable City (9 of 10 groups)
- Exploring AI – DALL-E (15 of 21 groups)
- Perception Playground – Vection (13 of 16 groups)

Groups were asked, what makes the digitally immersive exhibit space feel “immersive”; key themes that emerged included:

Table 3. Responses to “What made this feel very digitally immersive?” (n=31)

Code	Number of Groups (n=31)	Example quote
You’re controlling it	27	“The ability to control it, see the things on the screen also the physical parts like the wipers were cool.” (Trains)
Felt real/like you were in it	18	“Enclosed space, the walls were all digital, like you're in an environment” (Trains)
Takes up your field of vision / surrounding	7	“The fact that you are surrounded by screens and you are influencing the stuff happening around you (I:E)
Experience is responsive	5	“Action and results, how it senses the person so you see the outline on the floor that follows you” (I:E)
Interesting content	5	“We're majors in environmental science so that content is more for us, being able to choose the options in the room “ (I:E)
Using your physical body	5	“Choosing the character is immersive and it's interactive. They get to move their whole body” (DALL-E)

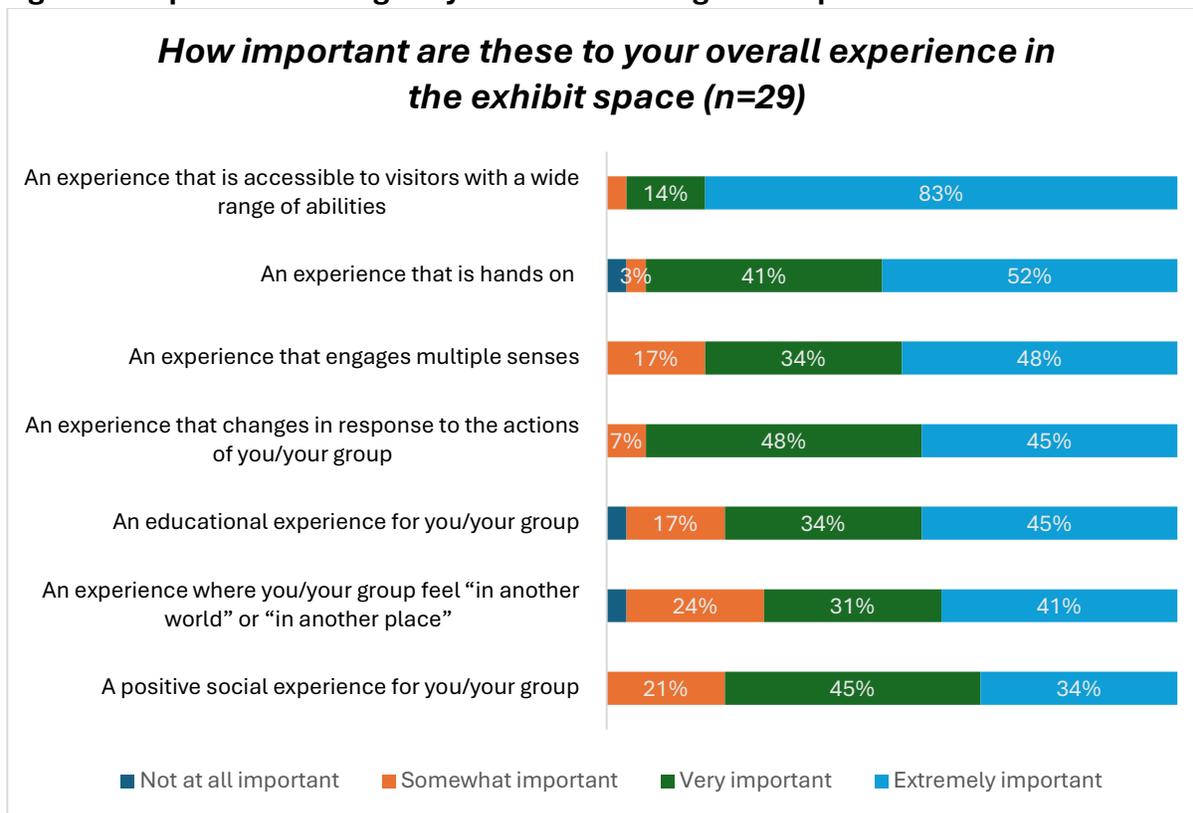
When further asked what made these exhibitions feel more “interactive,” visitors often described themes that were similar to what made a space immersive such as having an experience that is responsive, that you control, and that uses your physical body. As seen below, visitors also mentioned other themes that made a space interactive such as being hands-on, engaging the senses, and being tactile:

Table 4. Responses to “What made this exhibit feel interactive?” (n=28)

Code	Number of Groups (n=28)	Example quote
Experience is hands-on	8	“There are more pieces that are hands on” (Trains)
Experience is responsive	5	“It felt like you made choices and can see results, ‘Vection’ was more like a ride” (Exploring AI)
Experience engages the senses	5	“Because the topic area was senses, everything involved your participation. The setting of the exhibit with the black walls also helped, felt more closed off than open and you were in it doing stuff.” (Perception Playground)
You’re controlling it	4	“You can control it” (Trains)
Experience is tactile	4	“There were more things to touch” (I: E)
There are more activities / options	4	“There were more options at the train and the train tables” (Trains)
Using your physical body	3	“Again DALL-E is more physical and it was fun to watch the kids interact with it” (Exploring AI)
You can press buttons	3	“More that you could do that you could push the buttons of the art thing with your feet” (Exploring AI)
Interesting content	1	“I’m more interested in it.” (Trains)
It is good for all ages	1	“More things for the family to do, it was good for all ages” (Trains)

Finally, visitors were asked to rate the importance of different features of digitally immersive exhibit design. The survey used similar items to those asked of museum professionals, but some were worded in ways that would be more understandable to a wider audience. Visitors prioritized accessible experiences, those that are hands-on, and experiences that engaged multiple senses (such as sight, sound, and touch). Results of these ratings are in Figure 7.

Figure 7. Importance of Digitally Immersive Design Principles to Visitors



One distinction in comparing visitor responses to that of museum professionals was the importance of hands-on aspects and responsiveness. While visitors put these in the top 3 of the most important design principles, these were rated lower for museum professionals. Because of this, museums should consider how to give visitors the opportunity to interact in digitally immersive exhibit spaces, and where possible allow for the space to change in reaction to their actions, as this appears to be of importance to visitors who want to do more than “watch” a digital display. Responses from visitors indicate that this responsiveness can be achieved through multiple means. Some visitors included “full-body” interactions such as those seen in *Illuminating AI*’s DALL-E experience (“It’s good for interaction and seeing all the different combinations you can make, and you were using your body”), or the Train Conductor experience in *All Aboard! Trains at Science Park* which was a button press along with being able to speed up or slow down a video (“The experience of being inside the train, you can change the speed and direction”). Others talked about a space being able to interact through tactile experiences such as *Innovation: Earth* having “more things to touch.”

Conclusion

Visitors and museum professionals agree on the importance of creating accessible digitally immersive exhibition spaces. However, this may be more complex than simply a commitment to this design principle. Visitors were interested in multisensory, and museum professionals committed to multimodal interactions. Variety of interactions and inputs may make the space more accessible to more visitors.

At times, multisensory or multimodal inputs may be at odds with one another, so the field should continue to work with audiences on accessibility. Large digital displays may be inaccessible to blind and low vision audiences. Interactions that require full body movements may be inaccessible to audiences with limited mobility. If the immersive experience relies on a soundtrack to create the immersive environment, D/deaf or hard-of-hearing audiences may find the experience less compelling. Written text can overcome challenges with audio, but makes the experience less accessible to those with learning disabilities, people for whom their language is not represented in the experience, and young children who are pre-readers. By combining these sensory experiences (visuals, audio, text, variety of interactions) audiences with sensory processing differences may find such immersive environments overwhelming. Therefore, museums should continue to work closely with audiences in order to develop better strategies for accessibility in digitally immersive exhibit spaces, given the various accessibility strategies that may be at odds for audience groups.

Appendix

Appendix 1. Professional Survey

AIM Field Survey

Start of Block: Welcome & Design Principles

Survey Welcome Thank you for your interest in completing this online survey! The purpose of this survey is to evaluate the field's shared vision for the use of digital immersion in museums. The Alliance for Immersion in Museums is led by the Museum of Science, Boston and partner museums to create a community among museums working towards producing digital immersive exhibit spaces and set standards for digitally immersive exhibitions.

Information about the survey:

- The entire survey should take 5-10 minutes to complete.
- The survey includes questions about your thoughts about digital immersive exhibit spaces, your organization's approach towards including digital immersive exhibit spaces in your offerings, and optional demographics that help us understand the reach of this survey.

Information about your participation:

- To take this survey you must be 18 years of age or older. You should work in a museum, science center, or related industry (e.g., multimedia exhibition development) to report on digital immersive offerings.
- This survey is completely optional, you can skip questions or stop at any time.
- Your survey responses will be confidential.
- The information we collect from you may be useful for other studies. We may therefore decide to use this information again in the future or share it with other researchers, without asking for additional permission. If we do so, we will remove any personally identifiable information from your data before using it again or sharing it.

By continuing on to the next page you consent to participating in the study.

Thank you for your willingness to participate! Please contact Sarah Lukowski, Senior Associate, Research and Evaluation, at slukowski@mos.org with any questions about the survey.

DP_intro The Alliance for Immersion in Museums has been working towards putting together set of design principles for **digital immersive exhibit spaces**. Before you begin, please watch this ~60 second clip from a digital immersive exhibit space that utilizes three walls and a floor.

design_principles Please rate your agreement with the following statements. A digital immersive exhibit space should...

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
enable and encourage interaction between the digital interface and visitors.	•	•	•	•	•	•	•
encourage social interactions among visitors within the space.	•	•	•	•	•	•	•
be educational.	•	•	•	•	•	•	•
enable multimodal interactions, meaning there are different ways to interact in the space.	•	•	•	•	•	•	•
be multisensory, engaging (to the greatest extent possible) visitors' senses of sight, hearing, touch, and possibly smell.	•	•	•	•	•	•	•
feel physically/visually enveloping, such as taking up visitors' field of view.	•	•	•	•	•	•	•
change in reaction to visitor actions.	•	•	•	•	•	•	•
be enthralling or transporting, such as feeling "in it" or "in another world/place"	•	•	•	•	•	•	•
be accessible to visitors with a range of abilities.	•	•	•	•	•	•	•
evoke a sense of awe among visitors to the space.	•	•	•	•	•	•	•

End of Block: Welcome & Design Principles

Start of Block: Interest & Experience with Immersion

immersion_intro For this part of the survey we are defining “**Digital Immersive Exhibit Spaces**” or “**Digital Immersion**” as spaces that contain interactive and educational, technologically-driven, multisensory and multimodal digital experiences that are physically or visually enthralling. They are often, but not always, installed in an “immersive room” which can vary in size from small to large exhibition spaces and include digital projection that supports visitor interaction with walls, floors, and more. The experience changes in reaction to visitor actions.

immersion_status What would you say is your organization’s current position in implementing digital immersion in your space?

- Not planning on installing a digital immersive exhibit space (no current plans) (1)
 - Planning on installing a digital immersive exhibit space in 6 – 10 years (beyond 2030) (2)
 - Planning on installing a digital immersive exhibit space in 3 – 5 years (before 2030) (3)
 - Planning on installing a digital immersive exhibit space in 1 – 2 years (before 2026) (4)
 - Currently have a digital immersive exhibit space installed (5)
 - Other (please describe) (6) _____
-

Page Break

immersion_interest Organizations may produce/create digital immersive exhibit spaces (what we call 'producers' for the purpose of the question) or seek out exhibits from other organizations (what we call 'consumers' for the purpose of this question). Some organizations may have an interest in developing/producing a digital immersive exhibit space AND seeking out experiences produced elsewhere. How would you characterize

your organization's interest in producing and/or consuming digital immersive exhibit spaces? (Select all that apply)

6. Producer (current) – my organization has created a digital immersive exhibit space (such as one that could appear in an immersive room) (1)
7. Producer (near future) – my organization is planning to create and install a digital immersive exhibit space by the end of 2025 (2)
8. Producer (long range) – my organization is planning to create and install a digital immersive exhibit space by the end of 2030 (3)
9. Consumer (current) - my organization has hosted/installed a digital immersive exhibit space produced elsewhere (9)
10. Consumer (near future) – my organization is likely to seek out installing a digital immersive exhibit space produced elsewhere by the end of 2025 (4)
11. Consumer (long range) – my organization is likely to seek out installing a digital immersive exhibit space produced elsewhere by the end of 2030 (5)
12. Curious – my organization is keeping up to date with advances in digital immersive exhibit spaces but unlikely to produce or host such an exhibit space by 2030 (6)
13. Not Interested – my organization is not interested in pursuing digital immersive exhibit spaces in our offerings (7)
14. Other (please describe) (8) _____

Skip To: End of Block If Organizations may produce/create digital immersive exhibit spaces (what we call 'producers' for t... = Curious – my organization is keeping up to date with advances in digital immersive exhibit spaces but unlikely to produce or host such an exhibit space by 2030

Skip To: End of Block If Organizations may produce/create digital immersive exhibit spaces (what we call 'producers' for t... = Not Interested – my organization is not interested in pursuing digital immersive exhibit spaces in our offerings

Page Break

producer/consu_intro Thinking about the digital immersive exhibit space you currently have on exhibition or are planning to install...

planes How many planes are activated as part of the digital immersive exhibit space?

- Digital immersion utilizing one plane (1 wall or floor) (1)
 - Digital immersion utilizing two planes (2 walls, or a wall and a floor) (2)
 - Digital immersion utilizing three planes (3 walls, or 2 walls and a floor) (3)
 - Digital immersion utilizing four planes or more (at least four walls, or 3 walls and a floor) (6)
 - Other (please describe) (4) _____
 - Not sure (5)
-

floors Does your digital immersive exhibit space include an activated floor (projection/digital mapping/tracking on the floor)?

- Yes (1)
- No (2)
- Other (please describe) (3) _____
- Not sure (4)

End of Block: Interest & Experience with Immersion

Start of Block: About you and your organization

about you The next set of questions help us better understand the reach of our survey.

Page Break

industry How would you describe the industry you currently work in?

- Museum/Science Center (1)
- Multimedia Exhibition Production Industry (2)
- External Museum Consultant (3)
- Academic (4)
- Other, please describe: (5) _____

Display this question:

If How would you describe the industry you currently work in? = Museum/Science Center

museum type What type of museum do you work in?

- Art Museum (2)
- Children's Museum (8)
- History Museum (3)
- Historic House/Site (6)
- Natural History/Anthropology Museum (7)
- Science/Technology Center/Museum (1)
- Other (please describe): (5) _____

Page Break

role How would you describe your role? (select all that apply)

15. Exhibit/Experience Development (1)
16. Evaluation (2)
17. Museum Leadership (3)
18. Programs/Education (4)
19. Operations/Infrastructure (5)
20. Visitor Experience Facilitator/Visitor Services (6)
21. Advancement (7)
22. Marketing (8)
23. Community Engagement (9)
24. Shop/Exhibit Fabricator (10)
25. Other (please describe): (11) _____

Display this question:

If How would you describe the industry you currently work in? = Museum/Science Center

institutionsize What is the approximate annual operating revenue (in USD) of the museum/science center you currently work for? [annual operating revenue defined as: all earned revenue including gross revenue from all museum operations, film and exhibit rentals, all private and public (government) support, all restricted and unrestricted grants, and all interest and endowment income.]

- Less than \$500,000 (1)
- \$500,000 to \$1M (2)
- \$1M - \$3M (3)
- \$3M - \$5M (4)
- \$5M - \$10M (5)
- \$10M - \$15M (6)
- \$15M - \$20M (7)
- More than \$20M (8)

End of Block: About you and your organization

Start of Block: End_block

anythingelse Is there anything else you want us to know about your plans for, or thoughts about, digital immersive exhibit spaces?

End of Block: End_block

Start of Block: Optional Follow Up

followup If you are interested in learning more about joining the Alliance for Immersion in Museums please fill out the contact information below. We also plan to conduct focus groups later this winter to better understand how our field is approaching digital immersive exhibit spaces; only some of those interested in participating in the focus group may be selected. Focus group participants will get a gift card as a thank you for your time. You have the **option** of sharing contact information in the following questions.

interest_followup I am interested in... (select all that apply)

- 26. Learning more about participating in a focus group about digital immersion in museums (2)
- 27. Learning more about how my organization can join the Alliance for Immersion in Museums coalition (3)

name My name is:

email My email is:

End of Block: Optional Follow Up

Appendix 2: Professional Focus Group Script

0:00 – 0:02: Allow Time for Folks to Log On

0:03 – 0:05: Welcome, Intro Research Team

Hi everyone! Thank you for joining us today. I am Sarah Lukowski and I am a Senior Research & Evaluation Associate at the Museum of Science in Boston. I am joined by Sunewan Paneto, Assistant Manager of Research & Evaluation at Museum of Science. Sune will be supporting notetaking during this meeting. This focus group and broader work is supported by a grant from the Institute of Museum and Library Services to work towards forming a coalition of museums that are installing or interested in installing digitally immersive exhibit spaces.

Just a bit of housekeeping before we get started; we have Zoom audio transcription turned on for this meeting. You all should have signed the consent form to participate today, your participation is voluntary and you can stop at any time. Your name will not be linked to your comments today unless you ask that we do so. Does anyone have any questions about those logistics before we get started?

The session is going to be split into five segments. First, we'll do a short introduction of everyone in the group. Next we'll spend 15 minutes on discussing producing digitally immersive exhibit spaces. Then we'll talk about what models might work for sharing these experiences across institutions and costs and barriers involved. Finally, we'd like feedback on what an Alliance for Immersion in Museums might do for you and will wrap up our time together with final thoughts.

0:05 – 0:10 Group intros

Let's start by just going around the room, and hearing more about each of your backgrounds, so your name, institution and position or roles that you work in, and a bit about where your institution is at in their journey of exploring or installing digitally immersive exhibit spaces.

0:10 – 0:25 Production of Digitally Immersive Spaces

We have been considering different tiers of minimum viable products that might work for different institutions and what sort of technical specifications might best serve different tiers. The base module is one wall and one floor. We estimate that it would require about 12 ft of wall height, would include 2 projectors and 3 LiDAR sensors for tracking people in the space. This could be extended to a corner set up as well. A medium tiered project would use a minimum of 4 of these modules to create an 'immersive room'. And larger scale, multi-room projects are possible for a subset of institutions but would likely rely on close collaboration with external multimedia production partners to make custom experiences.

- **Which of these tiers, if any, are similar to something you've already been planning to install, have installed, or would be interested in installing?**
- **What are you most excited about in these different products?**
- **What challenges are you most concerned about when considering which of these options to include in your exhibit spaces?**

0:25 – 0:40 Sharing/Consuming Immersive Spaces

We have been thinking about there being two options for museums to share digital immersive spaces across sites. The first option would be similar to the current traveling exhibition model where all of the equipment along with the experience could be rented by a site.

The second model would involve you purchasing your own base set of equipment so that you would only be renting the digital files to run the experience and not the equipment itself. We estimate that the cost of the base equipment that museums would need is \$X, but you would be able to change out the digital experiences more frequently than the previous model.

- **Is digital immersion more something you envision for a traveling exhibition space, or something you would incorporate in your permanent exhibit offerings?**
- For those thinking of this as a traveling exhibit...
 - **How far in advance are you typically booking out a temporary exhibit space?**
- Let's consider the base equipment for a 2-plane module
 - We estimate one wall – one floor model to be about \$50,000 in infrastructure costs
 - Not including wall/flooring modifications that might be site specific
 - Can be less expensive if you use different projectors that aren't rated for continuous use
 - **How prohibitive (or not) would this sort of model be for your site?**
 - **What would you need to make the case for this sort of infrastructure investment?**

0:40 – 0:55 What can an Alliance for Immersion in Museums do for you?

The Museum of Science received an IMLS grant called the Alliance for Immersion in Museums or AIM to explore the creation of a coalition of museums to learn together about and share digital immersive exhibit spaces. We currently have mapped out three core audiences that might come together in the AIM coalition:

1. Museums with existing digitally immersive exhibit spaces
2. Museums that are planning on installing digitally immersive exhibit spaces
3. Multimedia production companies that work with museums to design and install digitally immersive exhibit spaces

What benefits would make you more likely to join such a coalition?

Are there features that these models don't yet capture what you hope an Alliance for Immersion in Museums could provide for you?

What barriers to participating do you think might come up for you?

Would your institution pay to be part of something like this? Why or why not?

0:55 – 1:00 Last word/final thoughts

Your thoughts are going to be compiled with other focus groups and then shared across our team. Thinking about all we've talked about today, **what would you highlight as a key take-home message?**

1:00: Thank you everyone for your time today, you've given us a lot to think about! You'll be receiving an email from TangoCard with your digital \$50 gift card for participating. Sune and I will also hang out for another few minutes if needed if there is something you had hoped to share but we didn't get to today. We plan to share back the broader results from the focus group so expect an email from us in April with findings. Thank you again!

Appendix 3: Public Data Collection Observation and Interview Instrument

From AIM narrative, the purpose of the evaluation is to ascertain:

To what extent do members of the public feel that the immersive experience reflects the design criteria (immersive, interactive, accessible, current)?

- What about the experience makes the public feel it does or does not fit the design criteria?
- What other design criteria are critical to immersive experiences?
- What modifications could be made to help the experiences better fit the design criteria?

Target audience: General visitors

Initial testing:

Groups visit 2 experiences

Introduction:

We are going to visit two exhibits that use a newer technology or exhibit design that we call digital immersion. I want you to try them out for as little or as long as you would like. After each exhibit I'll ask you some questions about what you think about the exhibits. There are no right or wrong answers, and your feedback helps us and the entire museum field learn more about building future exhibitions. Your group will get a \$25 American Express gift card as a thank you for your time. Does that sound like something your group would like to do with me today?

Let's start at [first exhibit]. Give participants time to interact with exhibit.

Open Observation, Exhibit 1: _____

Focus on: Any accessibility issues; interaction with digital immersive exhibit piece

Exhibit 1: _____

Have you visited this exhibit before? **YES** **NO**

Card Sort 1 (this is because all these exhibits we are evaluating have a digital immersive space with other elements that we do not think are digitally immersive exhibit components and we wanted visitors to define digital immersion)

I have some cards that show different parts of the exhibition. I want you to sort the cards into three categories: very digitally immersive, somewhat digitally immersive, and not at all digitally immersive, or if you'd don't recognize that part of the exhibition you can put it in the did not use pile.

Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use

Considering this part of the experience [select/show a very immersive card]. What made this very digitally immersive?

Are there any parts of the exhibit that didn't work well for you/group? Tell me more.

Okay, now I want us to visit another exhibit that has elements of digital immersion. Again, you can spend as much or as little time as you want in the exhibit and I'll have some follow up questions about your experience in the space.

Exhibit : _____

Keeping in mind your experience with this part (show very digitally immersive component) of the exhibit, how important are these to your overall experience in the exhibit space?

	Not At All Important	Somewhat Important	Very Important	Extremely important
A positive social experience for you/your group	1	2	3	4
An educational experience for you/your group	1	2	3	4
An experience where you/your group feel “in another world” or “in another place”	1	2	3	4
An experience that engages multiple senses	1	2	3	4
An experience that is hands on	1	2	3	4
An experience that changes in response to the actions of you/your group	1	2	3	4
An experience that is accessible to visitors with a wide range of abilities	1	2	3	4

Open Observation, Exhibit 2: _____

Focus on: Any accessibility issues; interaction with digital immersive exhibit piece

Exhibit 2: _____

Have you visited this exhibit before? YES NO

We'll start with the same activity as we did in the first exhibit.

Card Sort 2

I have some cards that show different parts of the exhibition. I want you to sort the cards into four categories: very digitally immersive, somewhat digitally immersive, and not at all digitally immersive, or something you did not see or use.

Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use

Considering this part of the experience [select/show a very immersive card]. What made this very digitally immersive?

Are there any parts of the exhibit that didn't work well for you/group? Tell me more.

Now I'd like you to think across the two exhibitions we visited today.

Did [exhibit1] or [exhibit2] feel more immersive? Why?

Did [exhibit1] or [exhibit2] feel more interactive? Why?

What did you like MOST of the two exhibitions we visited today? Why?

What did you like LEAST about the two exhibition we visited today? Why?

Is there anything else you'd like to share about your experience in these exhibits?

Visitor Demographics

Are you a member of the Museum of Science, Boston?

Yes

- No

Prior to this visit, when was the last time you visited Museum of Science, Boston?

- Less than 3 months ago
- 3 – 6 months ago
- 6 – 12 months ago
- 1 – 2 years ago
- 2 – 5 years ago
- 5 – 10 years ago
- More than 10 years ago
- Never
- Not sure

What is your age? _____

What is your gender?

- Man/Boy
- Woman/Girl
- Non-binary
- Prefer to self-describe: _____
- Prefer not to say

With which racial or ethnic group(s) do you identify? (Select all that apply.)

Please answer only for yourself, not for others in your group.

- American Indian or Alaska Native
- Asian or Asian American
- Black or African American
- Hispanic or Latino/a/x
- Middle Eastern or North African
- Native Hawaiian or Pacific Islander
- White
- Prefer to self-describe:

- Prefer not to say

Do you, or anyone in your group, have a permanent or temporary disability?

- Yes, [optional] please describe: _____
- No
- Prefer not to say

Please list the ages and genders of the other members of your group:

Group_Member	Age	Gender	Group_Member	Age	Gender
1			4		
2			5		
3			6		

Appendix 4: Other Public Data

Card sort responses by exhibition

Table 5. Visitor ratings of digital immersion for *All Aboard! Trains at Science Park exhibition* (n=13)

Component	Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use
Train Conductor	11	1	0	1
FAST Table	7	5	0	1
Skyline Layout	6	7	0	5
Symphony	5	4	0	1
Entry Bench	2	9	1	0
Tea	2	5	1	4
LEGO	1	0	12	0
Young Learner Tables	0	1	7	5

Table 6. Visitor ratings of digital immersion for *Innovation: Earth exhibition* (n=10)

Component	Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use
Immersive Room	9	1	0	0
FAST Landscapes Table	3	2	0	5
FAST Architecture Table	3	3	0	4
Would You Rather?	7	0	1	2
Fusion	2	4	3	1
Fungi	0	1	4	5
Seawall	0	1	3	6

Table 7. Visitor ratings of digital immersion for *Exploring AI* exhibition (n=21)

Component	Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use
DALL-E	15	3	0	3
Gallery Walls	1	11	5	4
Training AI	8	5	0	8
Spot Robot	3	12	5	1
Baking	0	2	12	7

Table 8. Visitor ratings of digital immersion for *Perception Playground* exhibition (n=16)

Component	Very digitally immersive	Somewhat digitally immersive	Not at all digitally immersive	Did not use
Intro	6	8	1	1
Change Blindness	3	7	1	5
Vibration	6	2	7	1
Bouba Kiki	6	5	3	2
Young Learner Area	0	0	1	15
Temperature	4	1	9	2
Vection	13	0	1	2
FAST Table	4	3	3	6
Dot Cloud	7	8	0	1
Weight	2	1	10	3

**Responses to, “What about [*Trains* exhibit component] was very digitally immersive?”
(n=13)**

- Kind of like looking through the windows, first person, you're controlling it, like you're counting candy canes, looking for the next station
- You're controlling the train, almost like virtual reality
- The ability to control it, see the things on the screen also the physical parts like the wipers were cool. The two walls take up the full screen and your whole field of vision.
- The visuals, how you control the speed, it's more than looking at the screen and gives you a sense of how fast it's going
- You can control the video and it moves
- The experience of being inside the train, you can change the speed and direction
- You were actually driving the train
- Digital feedback, train horn, video shook and it felt like I was part of the experience
- The screen in front, it felt like you were really driving
- High quality, the surroundings, felt like VR. The images in that corner were higher quality than some of the other walls; the lighting of the exhibit and how that one is enclosed in two walls make it more immersive too.
- It was very interactive, you had to be in it; and the screens -- there was a cause and effect and that's more immersive

Responses to, “What about [*Innovation: Earth* exhibit component] was very digitally immersive?” (n=11)

- You walk around and your physical stance influences the screens
- Maps out a green future, it's really important to see especially for kids to see the choices and what happens
- You're walking in a whole world and it goes well with the other parts of the exhibit
- Immediate feedback, the walls you can interact with, can see the circle around people showing where they stand. It was completely responsive to everything you did, same with plasma
- The fact that you are surrounded by screens and you are influencing the stuff happening around you
- It was a magic place, it felt like you were in a real city
- Action and results, how it senses the person so you see the outline on the floor that follows you
- The three walls, we were making responses to the questions and it was interactive
- Watching our real time actions, the scale of the exhibit made it immersive, it was about climate change but it was also tracking my movements

- Changed when you selected it. There were choices and you got to see it; you were actually interacting. It shows what it would look like in real life. I work in climate so it was an interesting topic.

**Responses to, “What about [AI/ exhibit component] was very digitally immersive?”
(n=19)**

- Cuz you had to train it and do things
- You're able to physically do it
- It drew you in, everything in there started a discussion like you had about bias in AI and why that's important
- It was familiar input, you could sit down and use the buttons
- Choosing the character is immersive and it's interactive. They get to move their whole body
- You get to choose what you want and what you make. Its all programmed but you get to choose something that's never been made before. Its like playing a game where you're visualizing something.
- There was clearly digital technology, a screen; I liked that it was interactive, it was responding to my choices
- It was interactive, MC says he likes the pictures, AF says the ability to save the image and see it in the gallery is fun; AF says it's fun to watch other people do it too
- AF1: Its interactive and you have to walk around; AF2: its fun to make decisions and see them on the screen; AF1: you have to be in the moment with the AI & robotic side of things
- FC1 says it's fun to move and walk around and pick different things, AF adds picking different criteria
- It's good for interaction and seeing all the different combinations you can make, and you were using your body
- We can physically see kids moving around and picking things
- The size and the fact that it was interactive, not with your hands but with your body
- FC1 describes it as interactive and fun
- FC1 says you can walk around and physically interact with it. FC2 added that it's constantly changing. AF1 agrees
- AF50: It was interactive; you can see where you were able to engage with an image that reflects the preferences you choose and create an image. [MF: she answered only somewhat because]: not very [immersive], because the standard with the

digital immersive is like, the IMAX theater or VR, where you are very aware of your surroundings

- It brought attention. CF12: I didn't like that it only works when its only you [MF: implying that it doesn't really work well when there's multiple people selecting difference answers, because that's what happened during observation]. I like I got to move around
- AF: You got to make a choice; AM: it was like a choose your own adventure
- You get to interact and make choices

Responses to, "What about [*Perception* exhibit component] was very digitally immersive?" (n=14)

- The effect worked really well, I felt motion. The size of the screens, and it was secluded so we could experience it together without other people.
- It feels like you're moving; the sound and video felt like motion. Feels like you were in it.
- You're experiencing something by looking at it. you feel like you're in that place and visiting it without doing anything.
- This checked both of the boxes. It felt like I was dragged into another world, or a digital space, and it was able to manipulate my senses.
- Tie-ins to research and seeing the predicted effects in their own experience. Vection was NOT digitally immersive because, per MC, it was "just like a normal screen", not effective
- FC1 says it's like you're "there in it", AF says transported, FC2 agrees
- it feels like you're literally standing there in the experience
- [change blindness] the activity was very interesting it made us want to stay. We ended up staying for 3 different sessions there.
- The sheer size of it relative to the area
- FC1 notes the giant screen, how it switched from image to image and tricked you into feeling like you were moving when you were not
- FC2 says it felt like you were in motion, felt immersive, engaged the imagination. FC1&3 agree.
- CF12: It felt like you were there, like you were actually in the place, your mind was moving in there.
- AF: the screen wraps around you and it's imitating motion. We were also worried about getting motion sick
- It felt like you were in a different space. I moved with the space.

Responses to, “Did [exhibit1] or [exhibit2] feel more immersive? Why?”

Code: Trains was more immersive (n=11)

- The [immersive room, participant pointed at it] had too many kids running around, but the other one [Trains] was calming, it was more of a full immersive environment
- It was more, kind of like more you're not reading as much because there's more pictures and videos, more exhibits where you can control what happens
- Large screens and more direct interaction like we could all do something
- There's more opportunities to lose yourself
- You get to see local places, and go to different places, you get to choose.
- You're walking in a whole world
- It was like a whole world with the walls
- You get to see what the trains are
- The atmosphere felt like a winter wonderland
- Because you get to drive it yourself
- Enclosed space, the walls were all digital, like you're in an environment

Code: Innovation: Earth was more immersive (n=2)

- We're majors in environmental science so that content is more for us, being able to choose the options in the room and see the results in [WYR] was really interesting
- It was more interactive and more educational. It had more information. There were things you could interact with, with trains it was all visual.

Code: AI was more immersive (n=3)

- Dall-E is more physical while change blindness is just visual
- Because of Dall-E--we liked to run and happy
- AF: it felt like you made choices and can see results, vection was more like a ride

Code: Perception Playground was more immersive (n=12)

- A little more cohesion it how it guided you through the exhibit. It did a lot of balancing of tactile WITH the screens. The concept of perception is more immersive too.
- Guided; it took you on a journey. Better intro, each has to do with the senses so the topic is immersive and interactive.

- They're (the kids) having to do things; talking about perspective. They get to play here more. I raise my kids without screens--they don't have phones nor any exposure on phones. "digital" is watching a little bit of TV--maybe 1 hour at most, and maybe while they are eating. in AI, there's only the images that is digital, and I'll say this again & again but there's only like, 1 thing there but 10 things here (perception) compared to AI.
- Interactivity; physical exhibit pieces; a separate area for the exhibit with distinct visual and sound design pieces
- It was more tied to everyday life experiences
- FC1 says more touching, AF adds more engagement of senses
- It felt like I was in another place
- it was a passive experience versus actually interacting, like with Dall-E
- FC1 uses words "oh my god" and "woah" to describe experience, and says AI was nothing she didn't already know
- AF1 says it's more physical and interactive, which all FCs agree with
- CF: the nose touch one. AF: the lighting of the space made it feel like you were part of the space
- I was transported to a new space

Responses to, "Did [exhibit1] or [exhibit2] feel more interactive? Why?"

Code: Trains was more interactive (n=8)

- You can control it
- More things for the family to do, it was good for all ages
- There were more options at the train and the train tables
- There are more pieces that are hands on
- I'm more interested in it.
- Has more activities to it
- You get to press the buttons
- There were more buttons for you to press

Code: Innovation: Earth was more interactive (n=3)

- There were more things to touch
- You just watch the trains so this one is more hands on

- If kids could press buttons to make the transitions or the trains stop it would be more interactive. In [Innovation Earth] the screen changes and we like the feedback. This one uses your whole body.

Code: AI was more interactive (n=6)

- More that you could do that you could push the buttons of the art thing with your feet
- You get to select things instead of just standing there
- Again DALL-E is more physical and it was fun to watch the kids interact with it
- Because you had to do physical movements to make it work
- Same as previous answer
- I made choices and got to see the results of my interaction

Code: Perception Playground was more interactive (n=10)

- The motion on the big screen and the vibration ones gave you a real physical reaction. You couldn't just observe to learn, you really had to do things yourself in a good way.
- Because the topic area was senses, everything involved your participation. The setting of the exhibit with the black walls also helped, felt more closed off than open and you were in it doing stuff.
- see previous response (more exhibits in here compared to AI)
- More things to pick up, buttons to press that actually did things
- Only DALL-E in AI was interactive but it was more hands on in Perception, per AF
- Same as before
- FC1 says there was more to touch and engage the senses
- FC3 says AI had more watching. FC1 mentions how there were only a few interactive things in AI, more in perception
- The first one was more intuitive, but the second one really engaged your senses
- [Perception] had a lot more

Visitor Demographics

Table 9. Responses to, “Are you a member of the Museum of Science, Boston? (n=31)

Response	# of groups
Yes	6
No	23

Table 10. Prior to this visit, when was the last time you visited Museum of Science, Boston? (n=29)

Last visit	# of groups
1-2 years ago	5
2-5 years ago	4
3-6 months	3
5-10 years ago	1
6-12 months	4
Less than 3 months ago	4
More than 10 years ago	1
Never	7

Table 11. Group type (n=31)

Group type	# of groups	Percentage
Adult and child	17	55%
Adult only	14	45%