**Evaluation of Aira Visual Interpretation Service
at the Oregon Museum of Science and Industry (OMSI)**

Prepared by

Grant Crim, Maria Zybina, Marcie Benne, and Shirley Welch

December, 2023

With generous support from

Oregon Commission for the Blind, OMSI, and the National Science Foundation

Executive Summary

The Oregon Museum of Science and Industry (OMSI) follows an Equity Action Framework to guide practices and decisions that can improve equity, diversity, accessibility, and inclusion at OMSI. During the development of the National Science Foundation (NSF)-funded exhibit, *Creatividad silvestre | Wild Creativity*, the project team worked on an accessibility plan and met with consultants from the Oregon Commission for the Blind to discuss ways the exhibit experience could be more inclusive and user-friendly. The consultants had many ideas and the project team chose to subscribe to the Aira visual interpretation Service, a smartphone app that accesses real-time human assistance to provide visual information for individuals who are visually impaired and choose to use the service.

Documentation of the Aira launch preparation can be reviewed in [Aira Playbook for OMSI [Google Slides]](#).

The user experience was evaluated through observation and interviews with Aira users and OMSI Guest Services Floor Supervisors. The evaluation included Aira users exploring the *Creatividad silvestre | Wild Creativity* exhibit, navigating the OMSI campus and attending an adult only OMSI After Dark event, as well as a staff Aira user. The data collection activities included:

- Scenario 1, Group 1: Exploring the *Creatividad silvestre | Wild Creativity* Exhibit
- Scenario 1, Group 2: Exploring the *Creatividad silvestre | Wild Creativity* Exhibit[1]
- Scenario 2: OMSI Campus Navigation (from the parking lot and within the museum)
- Scenario 3: OMSI After Dark (an adult only evening event with about 1,000 attendees)
- Staff participant: Interview with an OMSI staff Aira user
- Guest Services Staff: Interview with OMSI Floor Supervisors

Each of these scenarios provided valuable information pertaining to the effective use of Aira at OMSI and the experience this service offers guests with visual impairments.

For the purpose of this study, we used guided interviews and observation notes to assess the effectiveness of having Aira at OMSI. We ultimately engaged 16 visitors, 1 staff user and 3 Guest Services Floor Supervisors. The interview guides consisted of questions specific to the participants' experience using Aira during their visit. The questions asked how familiar users were with the service, the length of time it took them to reach an agent, how people used the

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[1] Scenario 1 Group 2 included youth only. The rest of the scenarios were adult only.

service, the quality of customer service, and how satisfied users were with the results of their goals (Table 1). This strategy helped us to understand Aira's contributions to the OMSI visitor experience and Aira's efficiency, challenges, and limitations at OMSI.

We found that Aira provided a unique experience to users in which they reported enhanced independence and social engagement. All users expressed that they valued the service and described a positive experience utilizing Aira during their visit. All participants were satisfied with the service as reflected in the findings (Table 2). By utilizing this service, guests felt more immersed in the museum experience, and were able to fully participate in both the informal learning in the museum and social engagement with those around them. One user stated:*"I highly recommend you keep it. Because I am able to say 'I went to a museum.' I value that experience."*

Providing Aira as a free service supports OMSI's mission of continuing to increase the diversity, equity, accessibility, and inclusion of guest experiences. OMSI strives to provide a space that is accessible to all, and we believe this is a step in the right direction. Users were able to explore independently and have new experiences. Aira allowed users to each have a unique and tailored experience matching their specific needs, whether it was reading a sign, navigating safely, or participating in a discussion that may have a visual component.

Given the results of this study, we recommend Aira as a fundamental resource worth investing in to continue OMSI's strategic advancement of accessibility and inclusion. The positive reception by guests, community members, and staff speaks to the need for further advancement in accessibility and inclusion. One staff member stated: *"It's a great thing for us to expand our accessibility and for us to be able to offer a valuable experience for guests with visual impairments…It's great to have this available as a real time service."*

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Introduction

Rationale for Aira at OMSI

The Oregon Museum of Science and Industry (OMSI) follows an Equity Action Framework to guide practices and decisions that can improve equity, diversity, accessibility, and inclusion at OMSI. For decades society has been working towards new technological advancements that afford people with visual impairments opportunities to enjoy the same experiences as others. At OMSI, visitors experience informal learning that fosters creativity, complex reasoning, and inspires innovation. The organization has actively pursued opportunities to increase the level of inclusivity and the tools/resources to help diverse populations enjoy the wonders of the museum.

Aira is a modern visual interpretation service and a bridge allowing users with visual impairments to interact with the world around them. During the development of the National Science Foundation (NSF)-funded exhibit, *Creatividad silvestre | Wild Creativity*, the project team worked on an inclusion plan and met with consultants from the Oregon Commission for the Blind to discuss ways the exhibit experience could be more inclusive and user-friendly. As a result of these consultations, the project team chose to subscribe to the Aira visual interpretation service, a smartphone app that utilizes real-time human assistance to provide visual information for individuals with visual impairments. On March 1, 2023 OMSI became an Aira access partner, and since then has been able to utilize the Aira subscription service to improve the accessibility of the organization's main campus.

Background on Aira

Aira is a subscription-based service established in 2015, that can connect users who are blind or visually impaired with trained remote agents via live video streaming (Figure 1) to assist users in navigating and comprehending visual environments. The agents answer questions, provide verbal descriptions, and assist with various tasks, thereby enabling users to engage in activities that would otherwise be challenging without sight.
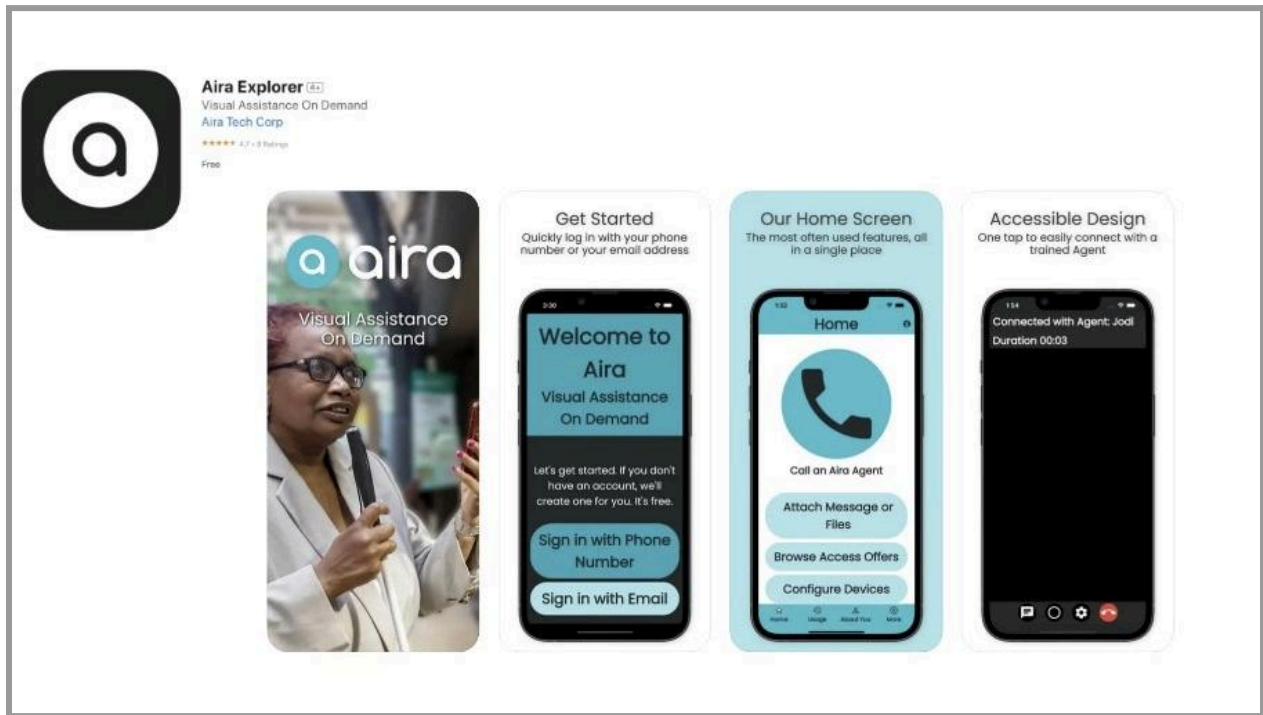
Figure 1. *The Aira Explorer App icon as it appears in Google Play and Apple Store.*

OMSI Overview and Preparation

The Oregon Museum of Science and Industry is a large science museum located in Portland, Oregon. Since its opening in 1944, OMSI has been dedicated to inspiring curiosity and lifelong learning in science and technology. Catering to visitors of all ages, the museum offers a wide range of interactive exhibits, educational programs, and hands-on activities that promote scientific literacy and critical thinking. Along with learning and creativity, one of the museum's core values is accessibility. OMSI strives to dismantle barriers to the experiences the organization provides and to create welcoming environments and conditions where all people can reach their full potential.

As an exceptional tool for people with visual impairments, Aira is currently a part of OMSI's commitment to diversity, equity, inclusion, and accessibility. OMSI preparation for introducing Aira on site included the following steps:

- Creating a geofence to define the territory covered by the service
- Preparing OMSI concierge phone check-out system: a) purchasing equipment

(smartphones, headphones, and phone lanyards) to provide visitors with if needed; b) setting up the profile ahead of time so the service is ready to go for guests

- Preparing and setting up a display with instructions on how to download Aira on guests' personal devices
- Developing communication materials (e.g. concierge response to email inquiries about Aira)

The detailed information and documentation of the Aira launch preparation can be reviewed in Aira Playbook for OMSI [Google Slides].

Preparation for the present evaluation study also included developing a logic model (Table 1) that describes the intended service users, the potential value of Aira for the specified users, the desired outcomes of the study as well as the indicators of success. As a result of this planning, three scenarios emerged and were agreed upon by key evaluators: 1) within an OMSI exhibit, 2) within the larger OMSI campus, and 3) within a large public event. Next, the instruments were designed to evaluate the outcomes within each scenario.

Users	Shared priorities	Outcomes	Indicators of success
Study participants (Scenarios 1-3)	Navigation at OMSI	Interviews provide feedback on users' increased confidence while navigating OMSI	The majority of participants report that Aira has added benefits for their navigation of OMSI and that the experience with the app and the agent was positive.
	Engagement with OMSI experiences	Interviews provide feedback on users' engagement with OMSI experiences	The majority of participants report they were able to engage with OMSI experiences, as activities and as social experiences.
	Aira's accessibility and usability	Interviews yield information on the ease of access to Aira and users' degree of confidence while using Aira	The majority of participants express positive experiences with access and usability.
OMSI staff	Engagement with OMSI staff experiences	Interviews yield information on Aira's role in supporting staff requests	The majority of staff users report that Aira supported them in accomplishing their goals in the workplace.
	Usefulness/utility of Aira in OMSI staff experiences	Interviews yield information on the value of Aira in the workplace	The majority of staff users report they were able to incorporate Aira in their work and saw value in it.
Guest services staff	Feeling a sense of confidence in supporting visitors interested in Aira	Interviews provide feedback on guest services staff perceived ability to support potential Aira users	The majority of guest services staff/volunteers report feeling prepared to provide support for potential Aira users. Guest services staff are trained.

Table 1. *Aira Visual Interpretation Service Outcomes Logic Model.*

Methods

Objectives

The overarching goal of this study was to document and evaluate OMSI visitors' and staff members' experiences with the Aira visual interpretation service during the summer of 2023 in order to: a) make immediate changes to improve the experience for users and staff, including heightening visibility with the general public and staff; b) help inform decisions about future use of Aira at OMSI, and c) share OMSI's experience with other museums to help them get prepared for hosting the Aira visual interpretation service.

The specific evaluation questions identified were:

1. How does the Aira service contribute to the overall experience for individuals with visual impairments at OMSI?
2. What are the challenges and limitations of implementing the Aira service at OMSI?

The evaluation team for this project included four researchers, none of whom had prior experience using Aira. One of the team members identifies as visually impaired and two speak Spanish.

Ethical Considerations

Participants have a right to privacy and understanding what they may or may not be agreeing to when they are involved in a study. Below are two premises included in this study:

- Informed consent: Informed consent was obtained from participants prior to data collection according to OMSI's informed consent procedures.
- Confidentiality: Surveys did not have identifying information; surveys were handled according to OMSI's data access and security guidelines.

Sample

Evaluation participants were recruited from three groups:

1. Guests were recruited to use Aira while exploring the museum. Participants were recruited through OMSI's social media and through staff at organizations serving community members with visual impairments. A list of organizations we contacted to promote the opportunity is in Appendix K. Sixteen guests participated in the study and each received a $50 gift card and OMSI general

admission tickets in appreciation for completing the outlined activities and interview.

2. One staff Aira user was recruited to provide his feedback on the use of Aira in the workplace. The staff member was a participant in the OCB Summer Work Experience Program (SWEP) and interned at OMSI during the summer 2023.

3. Three OMSI Guest Services Floor Supervisors were recruited to participate in the study because they were involved in supporting the general public's inquiries about the Aira service.

Data Collection

To obtain information about the Aira experience for OMSI guests with visual impairments we collected data during four different sessions (scenarios).

It is important to clarify that in this context we use the term "scenario" to define a typical situation any OMSI guest could potentially encounter when visiting museum exhibits and events on the days of data collection. The scenario situations we identified are as follows:

- Scenario 1, Group 1: Exploring the *Creatividad silvestre | Wild Creativity* Exhibit (Adults)
- Scenario 1, Group 2: Exploring the *Creatividad silvestre | Wild Creativity* Exhibit (Youth)
- Scenario 2: OMSI Campus Navigation (from the transit station and parking lot and within the museum)
- Scenario 3: OMSI After Dark (an adult only evening event with about 1,000 attendees)

We conducted a data collection session with an OMSI staff Aira user to obtain information about the role of Aira in supporting staff with visual impairments in the workplace. Finally, we also collected data from OMSI Guest Services staff to get an insight into their experience providing support for potential Aira users.

For the purpose of this study, we conducted guided interviews with participants and took detailed notes of our observations.

The interview guides for Scenarios 1-3, prepared in both Spanish and English, consisted of 10 questions specific to the participants' experience using Aira during their visit (see Appendices). The questions were designed to gather information on how familiar users were with the service, the length of time it typically took to reach an agent, customer service, and user satisfaction with the experience. In addition to the interviews, we observed the user interactions and whether the

participants had their needs or goals met. Observations were informal with notes written down for future analysis. Between the interview guide and observations we were able to better deduce the efficiency, challenges, and limitations of the service.

The interview guide for OMSI staff (intern) was focused on the usefulness of Aira in staff experiences, such as handling day-to-day tasks and accomplishing goals in the workplace. The interview guide for OMSI Guest Services staff sought feedback on their overall experience with the service, on how prepared they felt to support Aira users and what suggestions they had for improving the accessibility of Aira at OMSI.

A more detailed account of each data collection session is discussed below.

Scenario 1, Group 1: Adults Exploring *Creatividad silvestre | Wild Creativity*
Data collection for Scenario 1, Group 1 took place on July 29, 2023. The group consisted of seven individuals. They arrived at different times in groups of two or three. Upon arrival, the participants were instructed to find our table outside of the *Creatividad silvestre | Wild Creativity* exhibit to let us know they were on site. After checking in, the participants were asked to connect to Aira if they hadn't already, explore the exhibit with an Aira agent for at least 15 minutes, and once done, return for a brief interview. Upon returning to our table, they individually responded to guided interview questions (see Appendices A and B for English and Spanish versions) while staff documented their responses. In this scenario, all participants chose to do the interviews in English.

Scenario 1, Group 2: Youth Exploring *Creatividad silvestre | Wild Creativity*
Data collection for Scenario 1, Group 2 took place on August 26, 2023. This was an effort to involve youth ages 9-14, the exhibit target age range, in the Aira evaluation. This group consisted of a single youth participant and his caregiver, and followed exactly the same instructions as the Group 1. The participant spent at least 15 minutes at the Wild Creativity exhibit using Aira. After exploring the exhibit, the participant responded to guided interview questions (see Appendices C and D for English and Spanish versions) while staff documented his responses. In this scenario, the participant chose to do the interviews in English.

Scenario 2: OMSI Campus Navigation
Scenario 2 was developed for participants to explore the OMSI Campus using Aira. A few days prior to their visit, participants were sent the protocol. They were directed to utilize Aira from the moment they arrived at OMSI's parking lot, transit station, or a drop off point on the campus. We

wanted to hear about an open-ended Aira experience prior to and after entering the museum. After checking in at the guest services desk, participants were to visit our table in the lobby to let us know they were on site, and from there, they were off to explore the museum however they wanted, for a minimum of 30 minutes with an Aira agent.

Data collection for Scenario 2 took place on August 23, 2023. The group consisted of three participants, two of whom arrived together. Once finished with their exploration, they participated in a brief individual guided interview (see Appendices E and F for English and Spanish versions). In this scenario, all participants chose to do the interviews in English.

Scenario 3: OMSI After Dark
Data collection for Scenario 3 took place on August 30, 2023 and included adults attending OMSI After Dark "Pet Palooza!", an after hours event showcasing pets from various organizations and businesses offering pet related products and services. In this scenario, we wanted to hear about users' experiences with Aira at a busy event.

The group consisted of five participants, who arrived independently of each other. After checking in at the guest services' desk, the participants were to visit our table to let us know they were on site. They were all given the same instructions to explore the event and museum exhibits for as long as they wished (but for a minimum of 30 minutes), interact with other visitors and socialize using Aira. When they were finished with their exploration, they participated in a brief individual guided interview (see Appendices G and H for English and Spanish versions). In this scenario, all participants chose to do the interviews in English.

Staff Participant
Throughout the course of the summer 2023, OMSI partnered with the Oregon Commission for the Blind's Summer Work Experience Program (SWEP). A SWEP intern who was hired to work with OMSI's Property Development worked onsite for 3 weeks, 20 hours a week, and used Aira as needed, ranging from navigation to selecting images for presentation decks. Similar to Aira users in Scenarios 1-3, the intern participated in a guided interview that was tailored to focus on his use of Aira in the workplace. Data collection took place on July 21, 2023. The interview guide for this data collection activity is in Appendix I.

Guest Services Staff
Because Aira is an opportunity for guests, OMSI Guest Services staff are uniquely positioned to support the implementation of Aira by having conversations with visitors and responding to their

inquiries about the service. Three out of four OMSI Guest Services Floor Supervisors participated in the interview focused on their experience with Aira and Aira users (see Appendix J). Data collection took place the week of September 25, 2023.

Data Analysis

This study aimed at evaluating the Aira visual interpretation service at OMSI through visitor and staff experiences. The data collected consisted of written observation and guided interview notes. Data were analyzed using simple thematic coding, performed independently by two coders, to tease out patterns and themes. The coders shared their codes with each other, discussed and resolved any discrepancies, and then identified the emerging patterns. The patterns were then categorized into themes: navigation support, immersion in museum experiences, detailed descriptions, customer service experiences, and technology (see Table 2).

Themes	Scenario 1: *Wild Creativity*	Scenario 2: Campus Navigation	Scenario 3: OMSI After Dark
Navigation support	"Obstacles. Navigating around writing, pictures; layout of the room-middle,walls. It was amazing." "It was a lot better knowing the layout of the room; not bumping into things."	"Navigating through the darker exhibit was beautiful. Agent was able to describe everything at length. I was habitually ready to move on, but the agent was happy to tell me to take it slow."	
Immersion in museum experiences/ supporting independence	Nice and smooth; I could accomplish things faster than I would without the app."	"I highly recommend you keep it. Because I am able to say 'I went to a museum.' I value that experience." "I wouldn't have been able to visit-explore the museum had it not been for Aira."	"I got to 'see' cool bright things. I've never been able to explain something to someone I'm with—contributing to the conversation myself." "...my friend feels she is able to explore alone and I don't feel like I'm holding her back."
Detailed descriptions	"It was good. Very descriptive about everything. Some things the agent would read for me. Learned a little bit Very good description of the area. (Any barriers, etc)."	"She can definitely see way ahead before I can see, so I don't bump into people".	"I used it to orient through the entire space. She read all of the information; explored detail-oriented content. Then I could go back and explore it myself."

Customer service experience	"It was good. Very descriptive about everything. Some things the agent would read for me. Learned a little bit and there were good descriptions of the area. (Any barriers, etc)."	"100% wonderful experience w/o a sighted person, It would've been so different!"	"Made it alot more interesting. Planets, the babies. I wouldn't've spotted the fingernails. Like,'wow, It doesn't just look like a raisin'."
Technology /call quality	"It's very easy to use even with the screen reader. They have a large button for low vision and it is screen reader friendly." "The camera was lagging on and off through the experience. Her side was fine. Not mine."	"We were up in Geology- the connection broke. But not really that the agent was not able to."	"Connecting was no longer than 1 minute."

Table 2. *Thematic codes with examples/quotes from different scenarios.*

Results

Scenario 1, Group 1: Adults Exploring *Creatividad silvestre | Wild Creativity*

Scenario 1, Group 1 included seven individuals. Participant 1 waited for over 20 minutes to get connected with an agent. The disposable headphones she had checked out from the guest services desk proved to be insufficient, so she did not use them. After exploring the exhibit, the participant gave positive feedback on the Aira service and how it may benefit other users.

Participants 2 and 3, despite having arrived together and trying to connect from the same spot outside of the exhibit, had different wait times for connectivity. Participant 3 got connected quickly, while Participant 2 never connected with an agent after numerous attempts and extended wait times.

Participants 4 and 5 took their time navigating and exploring the exhibit in-depth. Upon returning for an interview, Participant 4 expressed that the experience was unique for her, as she was able to navigate and explore with relative independence thanks to the agent: *"It was a lot better knowing the layout of the room; not bumping into things. Nice and smooth; I could accomplish things faster than I would without the app."*

One of the participants, although headed towards the *Wild Creativity* exhibit, ended up being led into *Beginning the Journey*, an exhibit located in an adjacent room. Yet, in their interview upon return, they expressed a positive experience using Aira.

Overall, each of the participants was satisfied with the service, utilizing it through the entirety of their exploration beyond the 15 minutes requested. The only obstacle proved to be connection times, which OMSI IT team members said was likely related to a signal deadzone or other factors related to the relationships between different phones and OMSI's wifi signals. Participants acknowledged the need for Aira and expressed gratitude for the opportunity to utilize Aira at OMSI.

Scenario 1, Group 2: Youth Exploring *Creatividad silvestre | Wild Creativity*

The one participant in Scenario 1, Group 2 used Aira while navigating *Wild Creativity* independent of his mother. He explored the things that interested him, while his mother was able to step back and take in the exhibit as well. Although this visit was primarily meant to test the service for the youth, it equally impacted his mother. In her words she was able to "step back from playing the role of caregiver, and just be Mom." Both the youth and his mother expressed that the service was a positive experience that instilled a sense of independence in the youth. The mother affirmed his independence stating: *"I have been working as a mom on having him feel independent…Aira helped with that".*

Scenario 2: OMSI Campus Navigation

The group included three individuals. The first two participants arrived together and told the researchers about their experience traveling to OMSI. During their transit, their bus had to cross a bridge to get to OMSI, but the bridge was blocked, the bus was redirected, and they had to get off at a different stop than they anticipated. Having downloaded the app before arrival, they were able to utilize Aira to navigate the streets and traffic to successfully get to the museum.

Once inside OMSI, all of the participants took time to explore the museum in-depth, exceeding our request to use Aira for at

least 30 minutes. Similar to the users in Scenario 1, other than the wait times, all of the Scenario 2 participants had nothing but positive feedback for their experience with Aira and for OMSI offering the service.

Scenario 3: OMSI After Dark

The group included five individuals. One of the participants turned out to be a regular user of Aira and enjoyed testing locations that offered the service, adding that they wouldn't have gone to the museum without it.

Another participant arrived with a companion. Having previously engaged in Scenario 2, they became the only repeat participant in this study. During the guided interview, this user described their time as an incredible experience, affording them opportunities they never thought possible. Without assistance or descriptions from a friend, they felt they couldn't socially add to a conversation, but Aira changed that. They stated:*"I've never been able to explain something to someone I'm with, contributing to the conversation myself."*

One of the other Scenario 3 participants informed us that while he was using Aira in an exhibit, he was directed by an OMSI volunteer member to turn off his phone. One of the data collectors accompanied him to discuss the situation with the volunteer and explain that visitors are encouraged to use Aira during their OMSI visit. Once the issue was resolved, the participant received an apology, which was gladly accepted, and went off to continue using Aira throughout the museum.

Another two participants shared that not only were

they able to explore the museum, but also to engage socially with other visitors and vendors.

Overall, from Scenario 3 participants' interviews, we found that they had a positive experience with the service itself. Participants felt confident in their navigation and independence, requiring less support and description from their social group members in order to contribute to a conversation or to browse vendors. Visitors shared that they enjoyed utilizing Aira as a resource. For instance, one participant said: *"I used Aira to…explain more about the vendors. It's night time and I wouldn't be able to be doing that. Vendors were so fun! I was even able to skip over things I didn't want to see. I got to 'see' cool bright things."*

Staff User

The feedback we received from the staff participant about using Aira in the OMSI workplace was all positive. He utilized the service for everything from navigation to image description. OMSI is a large campus, and we were informed of one potential deadzone by the *Wild Creativity* exhibit, however it was not considered a large drawback by the staff user.

The individual expressed that having the service was vital for staff with visual impairments to thrive in the workplace. He shared that in his experience, Aira was *"very helpful. It's an essential tool for looking at images and visual tasks that may be lost on me without an extra boost."*

Guest Services Floor Supervisors

This group included three OMSI Guest Services Floor Supervisors. Through conversations with guest services staff, we learned that they were familiar with Aira on a basic level. They acknowledged that their experience supporting guests with Aira set-up or troubleshooting was limited. They were willing to learn more to be better support for potential Aira users at the museum. For instance, one person mentioned that they *"need training on how to identify guests and how to sensitively bring up the resource."*

Overall, we found that the service has been positively received (*"Guests have been happy that we have the app"*) and is viewed as a forward step for OMSI to increase community inclusivity and accessibility. The interviewed guest services staff members stated that Aira *"is a great resource to have. It invites people from the community that may otherwise not be able to enjoy the museum."*

Summary

During our study, the reception of Aira at OMSI has been positive. All of the individuals that participated provided positive feedback commending both the service and OMSI's initiative to create an inclusive and accessible atmosphere.

Connection times

A total of 16 participants took part in Scenarios 1-3, of which one participant never got connected with the Aira agent despite multiple attempts. For this reason, this individual was not able to fully participate in the guided interview. However, we took note of his wait time and included it in the total count.

Overall, connection times had a large variation, which was primarily impacted by connectivity issues. Once connected, all participants relayed positive feedback. Out of 16 participants, five reported that it took them more than 5 minutes to get an agent. Another five users shared that they were able to connect in under 2 minutes, and the rest of the participants had to wait between 2 and 5 minutes before getting an agent. Yet, once connected, all participants relayed positive feedback.

Customer service

All of the users from our study described their customer service experience with Aira as either "good" (n=4) or "exceptional" (n=11), stating that agents were professional, descriptive, and thorough in helping the users accomplish their goals as they explored the museum. Participants were also largely satisfied with the support they received from Aira agents, stating that agents were "somewhat" (n=1), "mostly" (n=1) or "very" (n=13) successful in helping them with their requests.

Although we had hoped to have a few participants with a primary language other than English to see if this would impact their access to Aira, all participants engaged with Aira and data collectors in English. As they were all able to connect with an English speaking agent, the language factor did not impact their access to the service.

Call quality

When asked to describe the technical side of the call, such as sound or video quality, seven participants expressed that it was "exceptional," while the rest felt it was "good" (n=7) and "acceptable" (n=1). Overall, we observed that the quality of the call was mostly impacted by

variables such as the use of headphones or phone speakers (participants shared that they could hear the agent better when they used headphones) as well as the surroundings of individuals (e.g. weak connection site, noise level, etc).

Discussion

Providing Aira as a free service supports OMSI's efforts to increase the diversity, equity, and inclusion of guests throughout the community. In our study, Aira users were able to explore independently and have new experiences. The service allowed users to each have a unique and tailored experience to match their specific needs. Whether it was reading a sign, navigating safely, or being able to participate in a discussion that may have a visual component.

We have identified two key areas that emphasize the importance of providing Aira as a service at OMSI. These include the value for experience and engagement, as well as the value of social group experiences at the museum. OMSI's unique informal learning thrives on social engagement; Aira allows users with visual impairments to be a part of that experience.

Value for Experience and Engagement

Aira provided opportunities and experiences that participants stated would otherwise not be possible. We heard from and observed users exploring the museum in depth, even taking part in visual activities outside of exhibit exploration. In addition to Aira offering new experiences for guests with visual impairments, some stated they wouldn't have come to the museum at all if the service wasn't offered. This combined with the positive data we collected shows that Aira is an essential tool that helps guests overcome obstacles and pursue new opportunities. Individuals feel empowered to do new things without needing to bring someone along. In addition, we are seeing a larger sense of community as guests and accessibility-oriented organizations take notice of this large step towards an inclusive environment for people with visual impairments.

Value for Social Group Experience

Guests shared that by using Aira, they felt empowered to explore with independence and able to take their time through the museum. In addition to the ability to explore independently, users reported a social aspect, where they were able to participate in conversations and share thoughts without needing someone from their visitor group to first describe or introduce the topic. Aira agents acted as a natural bridge allowing them to not just have physical independence, but even social. We observed participants using Aira while exploring and talking

with vendors at OMSI After Dark, and also having conversations with employees, visitors, and their friends about observations they made as they explored using Aira.

Aira is a step towards removing barriers for an inclusive OMSI, welcoming guests with visual impairments to take full advantage of what the museum has to offer, whether that is with a friend or a day of independent exploration.

Limitations

This qualitative study provides insight into the value of having the Aira service at OMSI. With that said, our data is limited in part because of time constraints and the limited number of participants. Our evaluation consisted of 16 guest participants, one staff user, and three Floor Supervisors. Working with more people across more scenarios can provide further information on how Aira can improve accessibility in an informal learning environment.

Recommendations for Further Implementation

Throughout the course of this study, we found the service to be an extremely positive experience. However, OMSI can continue to improve future experiences related to Aira.

In the present study, a few participants mentioned that they wouldn't have come to visit the museum unless they knew Aira was available. In order to increase community awareness about the free Aira service at OMSI, additional partnership development, marketing and promotion is essential. Additionally, funding is needed to continue the service beyond the grant period. To address these needs, additional meetings with OMSI Marketing and Development teams are scheduled.

While bolstering promotion of this service will increase its usage, we discovered that the museum would also benefit by training employees/volunteers to identify and support potential guests that may benefit from using Aira. Currently, we are aware of the Diversity and Disability Awareness training offered by the Oregon Commission for the Blind to support interested organizations in developing inclusive strategies for serving diverse populations.

Another important step to optimize the service's capability is improving connectivity so users have a stable connection. OMSI's IT team members are continuing to identify and fix weak connection sites throughout the museum.

As mentioned previously in this report, partnering with Aira was made possible within the NSF-funded exhibit, *Creatividad silvestre | Wild Creativity*. However, consistent funding and ongoing maintenance is needed to keep the Aira service available to OMSI visitors on a regular basis. It will be important for some division(s) within OMSI to take responsibility for sustaining the relationship with Aira and the activities associated with implementation, funding, and awareness-building.

Appendix A: Scenario 1, Group 1 Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview survey, and we'd love to hear your thoughts! The study aims to evaluate the user experience and interface of Aira here at OMSI. Your insights are crucial, and we promise that everything you share will be kept confidential. Participating is completely voluntary, and you can opt out anytime without any issues. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 5-10 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us a little about how you tried to incorporate Aira into your exhibit experience.	1.5. Did you work with Aira on the line the whole time or did you call them on and off as you wanted information?
Notes:	
2. How familiar are you with using Aira?	
Notes:	
3. For you, to what extent was using Aira an enhancement for the exhibit experience, if at all?	
Notes:	
4. Were there times that the agent was not able to help you with your request? If yes, please tell us about those examples.	
Notes:	
5. Overall, how successful were the agents in helping you with your requests?	6. How would you describe the customer service experience?
☐ Not at all ☐ Mostly ☐ Somewhat ☐ Very	☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional

Notes:	
7. How long did it take for you to get an agent?	8. Were you able to connect with an agent in the language you requested?
☐ 2 minutes or less ☐ 5 minutes or less ☐ 5 minutes or more	☐ Yes ☐ No
Notes:	
9. How would you describe the sound quality and communication between you and the agent?	10. Do you have any input for OMSI about having an Aira service?
☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional	Record response in Notes
Notes:	

Appendix B: Scenario 1, Group 1 Interview Guide [Spanish]

Hola, me llamo _____,

Estamos realizando entrevistas, ¡y nos encantaría saber tu opinión! El objetivo de este estudio es evaluar la experiencia del usuario y la interfaz de Aira aquí en OMSI. Tu aportación es importante y te prometemos que todo lo que compartas será confidencial. La participación es totalmente voluntaria y puedes optar por no participar en cualquier momento sin ningún problema. Durante la entrevista, te haremos una serie de preguntas y tendrás libertad para darnos tu opinión. La entrevista durará entre 5 y 10 minutos y nos comprometemos a respetar tu tiempo. Antes de empezar, necesitamos tu consentimiento. Aceptas participar en nuestra entrevista. Gracias por participar en esta importante investigación.¡Empecemos!

1. Por favor, cuéntanos un poco cómo trataste de incorporar Aira en tu experiencia en la exhibición.	1.5. ¿Trabajaste con Aira en línea todo el tiempo o les llamabas cuando necesitabas información?

Notas:

2. ¿Qué conocimiento tienes del uso de Aira?

Notas:

3. ¿En qué medida el uso de Aira ha mejorado tu experiencia de la exhibición, si es que lo ha hecho?

Notas:

¿Hubo momentos en los que un agente no pudo ayudarte con tu solicitud? Si es así, cuéntenos sobre esos instantes.

Notas:

5. En general, ¿qué tanto éxito han tenido los agentes al atender tus peticiones?	6. ¿Cómo describirías tu experiencia con el servicio de atención al cliente?
☐ Nada ☐ Bastante ☐ Algo ☐ Mucho	☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional

Notas:

7. ¿Cuánto tiempo tardaste en ponerte en contacto con un agente?	8. ¿Pudiste conectarte con un agente en el idioma que solicitaste?
☐ 2 minutos o menos ☐ 5 minutos o menos ☐ 5 minutos o más	☐ Sí ☐ No

Notas:

9. ¿Cómo describirías la calidad del sonido y la comunicación entre tú y el agente?	10. ¿Tienes alguna sugerencia para OMSI acerca del servicio Aira?
☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional	Anota la respuesta en Notas

Notas:

Appendix C: Scenario 1, Group 2 Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview survey, and we'd love to hear your thoughts! The study aims to evaluate the user experience and interface of Aira here at OMSI. Your insights are crucial, and we promise that everything you share will be kept confidential. Participating is completely voluntary, and you can opt out anytime without any issues. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 5-10 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us a little about how you used Aira as you explored the exhibit.	1.5. Did you use Aira the whole time or did you call them on and off as you wanted information?
Notes:	
2. Have you used Aira before?	
Notes:	
3.Did using Aira make it easier for you to explore the exhibit	
Notes:	
4. Were there times that the agent was not able to help you with your request? If yes, please tell us about those examples.	
Notes:	

5. Overall, how successful were the agents in helping you with your requests?		6. How would you describe the customer service experience?	
☐ Not at all	☐ Mostly	☐ Terrible	☐ Good
☐ Somewhat	☐ Very	☐ Acceptable	☐ Exceptional

Notes:	
7. How long did it take for you to connect with an agent?	8. Were you able to connect with an agent in the language you asked for?
☐ 2 minutes or less ☐ 5 minutes or less ☐ 5 minutes or more	☐ Yes ☐ No
Notes:	
9. How would you describe the sound quality and communication between you and the agent?	10. Do you have any suggestions for OMSI about having an Aira service?
☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional	Record response in Notes
Notes:	

Appendix D: Scenario 1, Group 2 Interview Guide [Spanish]

Hola, me llamo _____,

Estamos realizando entrevistas, ¡y nos encantaría saber tu opinión! El objetivo de este estudio es evaluar la experiencia del usuario y la interfaz de Aira aquí en OMSI. Tu aportación es importante y te prometemos que todo lo que compartas será confidencial. La participación es totalmente voluntaria y puedes optar por no participar en cualquier momento sin ningún problema. Durante la entrevista, te haremos una serie de preguntas y tendrás libertad para darnos tu opinión. La entrevista durará entre 5 y 10 minutos y nos comprometemos a respetar tu tiempo. Antes de empezar, necesitamos tu consentimiento. Antes de aceptar participar en nuestra entrevista. Gracias por participar en esta investigación tan importante.¡Empecemos!

1. ¿Podrías contarnos cómo utilizaste Aira para explorar la exhibición?	1.5 ¿Trabajaste con Aira en línea todo el tiempo o les llamabas cuando necesitabas información?
Notas:	
2. ¿Habías usado Aira antes de hoy?	
Notas:	
3. ¿El uso de Aira te facilitó explorar la exhibición?	
Notas:	
4. ¿Hubo momentos en los que el o la agente no pudo ayudarte con tu solicitud? Si es así, cuéntenos sobre esos instantes.	

Notes block	
Notas:	

5. En general, ¿qué tanto éxito han tenido los agentes al atender tus peticiones?	6. ¿Cómo describirías tu experiencia con el servicio de atención al cliente?
☐ Nada ☐ Bastante ☐ Algo ☐ Mucho	☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional

Notas:

7. ¿Cuánto tiempo tardaste en ponerte en contacto con un agente?	8. ¿Pudiste conectarte con un agente en el idioma que solicitaste?
☐ 2 minutos o menos ☐ 5 minutos o menos ☐ 5 minutos o más	☐ Sí ☐ No

Notas:

9. ¿Cómo describirías la calidad del sonido y la comunicación entre tú y el agente?	10. ¿Tienes alguna sugerencia para OMSI acerca del servicio Aira?
☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional	Anota la respuesta en Notas

Notas:

Appendix E: Scenario 2 Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview survey, and we'd love to hear your thoughts! The study aims to evaluate the user experience and interface of Aira here at OMSI. Participating is completely voluntary, and you can opt out anytime without any issues. Your insight is crucial and we appreciate you volunteering your time to help give us feedback. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 5-10 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us a little about how you tried to incorporate Aira into your museum experience.	1.5. Did you work with Aira on the line the whole time or did you call them on and off as you wanted information?
Notes:	
2. How familiar are you with using Aira?	
Notes:	
3. For you, to what extent was using Aira an enhancement for your exploration of the OMSI campus?	
Notes:	
4. Were there times that the agent was not able to help you with your request? If yes, please tell us about those examples.	

Notes:	
5. Overall, how successful were the agents in helping you with your requests?	**6. How would you describe the customer service experience?**
☐ Not at all ☐ Mostly ☐ Somewhat ☐ Very	☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional
Notes:	
7. How long did it take for you to get an agent?	**8. Were you able to connect with an agent in the language you requested?**
☐ 2 minutes or less ☐ 5 minutes or less ☐ 5 minutes or more	☐ Yes ☐ No
Notes:	
9. How would you describe the sound quality and communication between you and the agent?	**10. Do you have any input for OMSI about having an Aira service?**
☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional	Record response in Notes
Notes:	

Appendix F: Scenario 2 Interview Guide [Spanish]

Hola, me llamo _____,

Estamos realizando entrevistas, ¡y nos encantaría saber tu opinión! El objetivo de este estudio es evaluar la experiencia del usuario y la interfaz de Aira aquí en OMSI. Tu aportación es importante y te prometemos que todo lo que compartas será confidencial. La participación es totalmente voluntaria y puedes optar por no participar en cualquier momento sin ningún problema. Durante la entrevista, te haremos una serie de preguntas y tendrás libertad para darnos tu opinión. La entrevista durará entre 5 y 10 minutos y nos comprometemos a respetar tu tiempo. Antes de empezar, necesitamos tu consentimiento. Aceptas participar en nuestra entrevista. Gracias por participar en esta importante investigación.¡Empecemos!

1. Por favor, cuéntanos un poco cómo trataste de incorporar Aira en tu experiencia en la exhibición.	1.5. ¿Trabajaste con Aira en línea todo el tiempo o les llamabas cuando necesitabas información?

Notas:

2. ¿Qué conocimiento tienes del uso de Aira?

Notas:

3. ¿En qué medida el uso de Aira ha mejorado tu experiencia de la exhibición, si es que lo ha hecho?

Notas:

¿Hubo momentos en los que un agente no pudo ayudarte con tu solicitud? Si es así, cuéntenos sobre esos instantes.

Notas:

5. En general, ¿qué tanto éxito han tenido los agentes al atender tus peticiones?		6. ¿Cómo describirías tu experiencia con el servicio de atención al cliente?	
☐ Nada	☐ Bastante	☐ Terrible	☐ Buena
☐ Algo	☐ Mucho	☐ Aceptable	☐ Excepcional

Notas:

7. ¿Cuánto tiempo tardaste en ponerte en contacto con un agente?	8. ¿Pudiste conectarte con un agente en el idioma que solicitaste?
☐ 2 minutos o menos ☐ 5 minutos o menos ☐ 5 minutos o más	☐ Sí ☐ No

Notas:

9. ¿Cómo describirías la calidad del sonido y la comunicación entre tú y el agente?		10. ¿Tienes alguna sugerencia para OMSI acerca del servicio Aira?
☐ Terrible	☐ Buena	Anota la respuesta en Notas
☐ Aceptable	☐ Excepcional	

Notas:

Appendix G: Scenario 3 Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview survey, and we'd love to hear your thoughts! The study aims to evaluate the user experience and interface of Aira here at OMSI. Participating is completely voluntary, and you can opt out anytime without any issues. Your insight is crucial and we appreciate you volunteering your time to help give us feedback. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 5-10 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us a little about how you tried to incorporate Aira into your museum experience.	1.5. Did you work with Aira on the line the whole time or did you call them on and off as you wanted information?

Notes:

2. How familiar are you with using Aira?

Notes:

3. For you, to what extent was using Aira an enhancement for your exploration of the OMSI campus?

Notes:

4. Were there times that the agent was not able to help you with your request? If yes, please tell us about those examples.

Notes:

5. Overall, how successful were the agents in helping you with your requests?	6. How would you describe the customer service experience?
☐ Not at all ☐ Mostly ☐ Somewhat ☐ Very	☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional

Notes:

7. How long did it take for you to get an agent?	8. Were you able to connect with an agent in the language you requested?

☐ 2 minutes or less ☐ 5 minutes or less ☐ 5 minutes or more	☐ Yes ☐ No
Notes:	
9. How would you describe the sound quality and communication between you and the agent?	10. Do you have any input for OMSI about having an Aira service?
☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional	Record response in Notes
Notes:	

Appendix H: Scenario 3 Interview Guide [Spanish]

Hola, me llamo _____,

Estamos realizando entrevistas, ¡y nos encantaría saber tu opinión! El objetivo de este estudio es evaluar la experiencia del usuario y la interfaz de Aira aquí en OMSI. Tu aportación es importante y te prometemos que todo lo que compartas será confidencial. La participación es totalmente voluntaria y puedes optar por no participar en cualquier momento sin ningún problema. Durante la entrevista, te haremos una serie de preguntas y tendrás libertad para darnos tu opinión. La entrevista durará entre 5 y 10 minutos y nos comprometemos a respetar tu tiempo. Antes de empezar, necesitamos tu consentimiento. Aceptas participar en nuestra entrevista. Gracias por participar en esta importante investigación.¡Empecemos!

1. Por favor, cuéntanos un poco cómo trataste de incorporar Aira en tu experiencia en la exhibición.	1.5. ¿Trabajaste con Aira en línea todo el tiempo o les llamabas cuando necesitabas información?

Notas:

2. ¿Qué conocimiento tienes del uso de Aira?

Notas:

3. ¿En qué medida el uso de Aira ha mejorado tu experiencia de la exhibición, si es que lo ha hecho?

Notas:

¿Hubo momentos en los que un agente no pudo ayudarte con tu solicitud? Si es así, cuéntenos sobre esos instantes.

Notas:

5. En general, ¿qué tanto éxito han tenido los agentes al atender tus peticiones?	6. ¿Cómo describirías tu experiencia con el servicio de atención al cliente?
☐ Nada ☐ Bastante ☐ Algo ☐ Mucho	☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional

Notas:

7. ¿Cuánto tiempo tardaste en ponerte en contacto con un agente?	8. ¿Pudiste conectarte con un agente en el idioma que solicitaste?

☐ 2 minutos o menos ☐ 5 minutos o menos ☐ 5 minutos o más	☐ Sí ☐ No
Notas:	
9. ¿Cómo describirías la calidad del sonido y la comunicación entre tú y el agente?	10. ¿Tienes alguna sugerencia para OMSI acerca del servicio Aira?
☐ Terrible ☐ Buena ☐ Aceptable ☐ Excepcional	Anota la respuesta en Notas
Notas:	

Appendix I: Staff Participant Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview survey for staff utilizing Aira, and we'd love to hear your thoughts! The study aims to evaluate the user experience and interface of Aira here at OMSI. Your insights are crucial, and we would love to learn more about Aira enhancing the workplace. Participating is completely voluntary, and you can opt out anytime without any issues. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 5-10 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. Because we have a small number of people participating, we cannot guarantee confidentiality. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us a little about how you incorporate Aira into your work life.
Notes:
2. How familiar are you with using Aira?
Notes:
3. What does it mean to you to have Aira as a free service at OMSI and how do you feel it adds value to your work?
Notes:
4.Can you think of a time when the agent was not able to help you with your request? If yes, please tell us about those examples.
Notes:

5. Overall, how successful are agents in helping you with your requests?	6. How would you describe the customer service experience?
☐ Not at all ☐ Mostly ☐ Somewhat ☐ Very	☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional

Notes:

7. How long does it typically take for you to get an agent?	8. Are you able to connect with an agent in your preferred language?

☐ 2 minutes or less ☐ 5 minutes or less ☐ 5 minutes or more	☐ Yes ☐ No
Notes:	
9. How would you describe the sound quality and communication between you and the agent?	10. Do you have any input for OMSI about having an Aira service?
☐ Terrible ☐ Good ☐ Acceptable ☐ Exceptional	Record response in Notes
Notes:	

Appendix J: Guest Services Staff Interview Guide [English]

Hey there, my name is _____,

We're conducting a guided interview for staff supporting Aira, and we'd love to hear your thoughts! We are doing an evaluation of the user experience and interface of Aira here at OMSI. Your insights are crucial, and we would love to learn about Aira from your perspective as a staff person supporting the users. Participating in this interview is completely voluntary, and you can opt out anytime without any issues. During the interview, we'll ask you a series of questions, giving you the freedom to express yourself. It'll take about 10 -15 minutes, and we promise to be mindful of your time. Before we start, we need your informed consent. Because we have a small number of people participating, we cannot guarantee confidentiality. By continuing, you agree to join our survey. Thanks for being part of this important research. Let's get started!

1. Please tell us about your experience with Aira and Aira users at OMSI.
Notes: Prompt: Do you have any [other] observations you want to share?
2. Tell us about any [other] questions or feedback you've received about Aira.
Notes:
3. What do you see as the value of offering Aira at OMSI?
Notes:
4.Tell us how equipped you feel to support Aira users.
Notes:
5. How can we and should we improve the Aira service at OMSI?
Notes:
6. How can we better communicate the availability of Aira to staff and guests?
Notes:
7. Other thoughts we should know or include in our evaluation report?
Notes:

Appendix K: Internal and External Partners

An internal, cross-functional team helped create a positive Aira experience for guests. For example, we worked with these colleagues and more.

- Advocates for Aira and accessibility within the organization
- Guest Services
- Marketing
- IT
- Events
- Exhibits
- Volunteer Services
- All staff

Partners are important as they can help advise and promote while providing new perspectives. Here are some possible organizations we identified; undoubtedly, there are more.

- American Council of the Blind (ACB) of Oregon
- Association for Education and Rehabilitation of the Blind and Visually Impaired
- Columbia Regional Inclusive Services
- National Federation of the Blind (NFB) of Oregon
- NW Association Blind Athletes
- Oregon Adaptive Sports (OAS)
- Oregon Commission for the Blind
- Oregon Hull Foundation for the Blind
- Portland Community College Accessibility and Disability Resource
- Portland State University Disability Resource Center
- Washington DSB Skills Camp Vancouver WA
- Washington State School for the Blind