

UX Approaches for Museum Contexts: Evaluating a Museum's Participatory Elements

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ABSTRACT

Our research applies UX principles and scholarship to museum design in order to provide these institutions with tools that they can use to evaluate the effectiveness of their existing participatory elements, implement new participatory practices, and provide visitors with interactive experiences. After conducting observations and cataloging participatory elements in the MSU Museum, as well as reviewing relevant UX scholarship from Norman (2013), Shirky (2008), Simon (2010), Spinuzzi (2005), and others who have talked about participation and experience design, we created two documents: a definition guide and an evaluation form. Using the documents, we created and museum contexts as an example, we explain that UX concepts can be broadly applied to other industries in order to inform participation practices. The main takeaway from our research is that UX terms and concepts are flexible enough to be applied to multiple industries in order to improve the effectiveness of an organization or institution's current participatory elements and help them reach their goals regarding user participation.

CCS Concepts

• Human-centered computing → Interaction design • Applied computing → Education → Interactive learning environments

Keywords

user experience, participatory design, participatory elements, interaction, evaluation

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1 INTRODUCTION

User experience (UX) is a growing field that has practical applications for a wide variety of industries. One particular context that UX concepts are especially suited for is the design of museums. It can be argued that the primary goal of cultural institutions such as museums is tied closely with education, as the aim of these institutions is to provide visitors with enjoyable but ultimately informative experiences. This is achieved through many different types of content that all invite the visitor to interact in some way. That being said, participatory techniques have not always been implemented into museum designs. Simon (2010) argues that making museums participatory encourages more meaningful interactions between visitors and exhibits because

We believe that viewing museums from the perspective of participation and designing exhibits and museum elements with participatory design outcomes in mind, will be beneficial to both museums and their visitors. Our research applies UX principles and scholarship to museum design in order to provide institutions with tools to evaluate the effectiveness of their existing participatory elements, implement new participatory practices, and provide visitors with interactive experiences. To give us insight about what types of participatory elements museums include in their spaces, we conducted several days of observations at the MSU Museum. During this time, we were looking specifically at what tools, objects, and technologies the museum had within each exhibit to encourage participation. We also noted how visitors interacted with the participatory elements and how their interactions were connected with the design of the museum's exhibits.

Based on our observations in the MSU Museum and our review of UX scholarship related to participation, we created two documents that can be used by museums to evaluate the effectiveness of their participatory elements. The first document is a guide which defines the key terms that are important to museum participation and provides visual examples of items found at the MSU Museum that match with these definitions. The second document is an evaluation form/rubric that museums can use when examining the participatory elements that they have already incorporated into their space.

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We begin by outlining the scholarship that informed our understanding of participation, participatory design, and the evaluation of participatory elements. We then examine how this scholarship shaped our understanding of the key terms used throughout our materials, and explain how we used (and, in some cases, shifted) their meanings to fit within the context of museums. Additionally, we recount specific examples from our museum observations that provided insight into visitor interactions within museums. Next, we explain the content within each document that we created as a result of our research and the implications that these documents have for museum professionals and UX researchers. Lastly, we make connections between the museum context and other industry contexts where this research could be valuable.

2 BACKGROUND

2.1 Defining Participation

The definition of participation varies widely based on the situation, and before beginning to create an evaluative tool that could be used by the museum industry, we first had to define participation in the context of a museum. Our understanding of museum participation acknowledges that visitors actively participate the entire time they are within a museum space—even looking at an object is a mode of participation. Yet, our research focuses on visitor experiences where a visitor role is more than as a “passive spectator, but rather as [an] active participator” [1]. Lauralee Alben provides an excellent definition of experience when she states that it encompasses, “. . . all the aspects of how people use a product: the way it feels in their hands, how well they understand how it works, how they feel about it while they’re using it, how well it serves their purposes, and how well it fits into the entire context in which they are using it” [2]. In the museum context, this definition can be expanded to include all of the ways visitors interact with the objects, tools, and technologies provided in that space.

Participation in museums is often shaped by tacit knowledge, or knowledge that is “implicit rather than explicit, holistic rather than bounded and systematized; it is what people know without being able to articulate” [3, p. 165]. In the environment of a museum, people may be guided to interact with certain elements based on their placement or signage, but their actual participation within the museum is inherently connected with their tacit knowledge of the museum itself and the design of any specific participatory element. In this way, participatory elements can “*fit into* the existing web of tacit knowledge, workflow, and work tools, rather than doing away with them” [3, p. 165]. Therefore, participation in museum settings is tied to the affordances of the museum itself and the ways the visitors interact with the various participatory elements that are present. Norman writes that affordances “represent the possibilities in the world for how an agent (a person, animal, or machine) can interact with something. Some affordances are perceivable, others are invisible” [4, p. 18]. In museums, the affordances can be shaped by an individual’s tacit knowledge of the museum experience before they enter, as

well as the possibilities for interaction as they encounter tools, technologies, and content that the museum provides in order to facilitate participation.

Even though participation is an inherent property of museums, an understanding of participatory design is important for museums as they seek to become more accommodating and interactive. This knowledge leads to better experiences for visitors as museums account for their actual motivations. Salvo explains this idea when he states, “When one engages another person as an individual, as a person, one recognizes the humanity of the other. This recognition makes it possible to know the other’s needs, which is the point of participatory design: to know from the other’s perspective what is needed to improve the usability of the design” [5, p. 276]. As visitors transition from spectator to participator, participatory design allows museums to anticipate their needs and conceptualize them as “co-designers” of content [6, p. 45]. This gives museums a methodology to envision “designing for use before it actually has taken place” [6, p. 45]. By incorporating visitors into the design process through participatory methods or even objective observations, museums can use participatory design to encourage visitors to think of themselves as co-designers of the content and of the experience. Essentially, participatory museums are places “. . . where visitors can create, share, and connect with each other around content” [7, p. ii]. In other words, a museum is seen as participatory if it includes elements that invite visitors to make, share, or interact in some way.

2.2 Participatory Elements

In our view, participatory elements are any tools or objects that allow visitors to interact in some way. Examples of these elements include video monitors, touchscreens, boards with post-it notes, activity stations, etc. The goal of a participatory element is to “. . . create new value for the institution, participants, and non-participating audience members” [7, p. 6]. In some cases, participatory elements might only be seen as added fun for visitors, but as Simon warns, “If you focus solely on participation as a ‘fun activity,’ you will do a disservice both to yourself as a professional and to visitors as participants” [7, p. 16]. It is true that these elements are often designed for visitors’ enjoyment, but their use can also create meaningful, educational experiences if designed as participatory objects.

Writing on the topic of group dynamics, Clay Shirky argues that there are three components of successful collaborative mechanisms: “. . . a plausible promise, an effective tool, and an acceptable bargain with the participants” [8, p. 260]. In *The Participatory Museum*, Nina Simon connects Shirky’s mechanisms with the museum environment when referring to projects where participants work with museum professionals to craft participatory experiences [7, p. 17]. The framework of promise, tool, and bargain can also be used to define participatory elements in museum spaces. Our definition of participatory elements in museums uses these three mechanisms to separate participatory features from the static museum content.

To explain these three mechanisms further, Shirky defines the *promise* as the “why” when considering how groups choose to interact because the promise is rooted in the “basic desire to participate” [8, p. 261]. In most participatory elements, the promise of an appealing participant experience is inherently linked to the goals of the institution. The MSU Museum’s mission statement explains that the museum is committed to “understanding, interpreting, and respecting natural and cultural diversity” through “education, exhibitions, research, and the building and stewardship of collections” [9]. In this case, the MSU Museum promises that visitors will be given opportunities to understand, interpret, and respect diversity. As this example shows, successful participatory elements in a museum space are designed to provide visitors with an outcome that matches the institution’s goals, and participatory tools can fulfill that institution’s promises.

At the MSU Museum, the participatory *tools* themselves come in many forms, and participatory design can assist museums as they decide “which tools will best help people approach the promise together” [8, p. 261]. The *bargain* involved in a participatory element is a negotiation between a visitor’s actions and the museum-provided tools and content. Shirky considers a bargain to be a “transaction cost” because people must use their personal agency and make the decision to interact with the tool provided in order to fulfill the promise of the participatory element [8, p. 270]. At the same time, the bargain is the most complex of the three terms because “users have the biggest hand in creating” it [8, p. 270]. In a bargain, visitors are responsible for deciding whether or not they will participate with an element and how they will interact.

Participatory elements can also be defined by their characterization as social objects. Nina Simon defines social objects as “the engines of socially networked experiences, the content around which conversation happens” [7, p. 127]. Social objects create discussion through interaction, and are characterized by their ability to connect people with content and to entice collaboration or discussion. In addition, social objects can be distinguished from ordinary objects because they are “transactional, facilitating exchanges among those who encounter them” [7, p. 129]. Simon identifies four common traits of social objects: they are personal, active, provocative, and relational [7, p. 129]. The personal occurs when a visitor feels connected with the object or its implications in some way [7, p. 129]; the active when discussion arises from the movement of the object or people in relation to it [7, p. 130]; the provocative when visitors are surprised by an object’s placement or content [7, p. 131]; and the relational when the object invites multiple people to use it simultaneously [7, p. 132].

Not every participatory element is inherently a social object. We tend to believe that when creating participatory elements, many museums aim to elicit a social reaction or conversation, but whether or not the participatory object is truly a social object depends entirely on the visitor and their response to the object in the space. Museums might not be able to completely determine

whether or not the objects they include to encourage participation will become social. However, thinking about participatory elements as personal, active, provocative, and/or relational social objects, and evaluating whether certain participatory elements have the qualities of social objects, can lead to a greater understanding of how participatory elements function within museums.

3 PROJECT DESIGN

Our initial move when setting up this project was to meet with an employee of the MSU Museum and get more information about their needs. This meeting was helpful for us to find out more about the institution’s goals related to participation, and to ask questions about the logistical considerations, such as the best times for observations. Our primary method of research relied entirely on observations, which we conducted over the course of five days in two-hour blocks. Based on these observations, the MSU Museum’s objectives, and the scholarship of Simon, Spinuzzi, Shirky, and Norman, we created a cohesive group of deliverables that represents the many forms of participation we observed while at the MSU Museum.

We decided that the best ways to accommodate the museum’s needs was to develop journey maps of a typical visitor’s route through the museum and the participatory elements they interact with, museum maps with labeled participatory elements, a database of all the museum’s participatory features, a definition guide of key terms (drawing from UX-related scholarship), and a rubric to be used for evaluating participatory elements. We felt that each of these pieces could provide unique insights on visitor participation, allowing the museum to see the many ways their visitors interact within the museum’s exhibits.

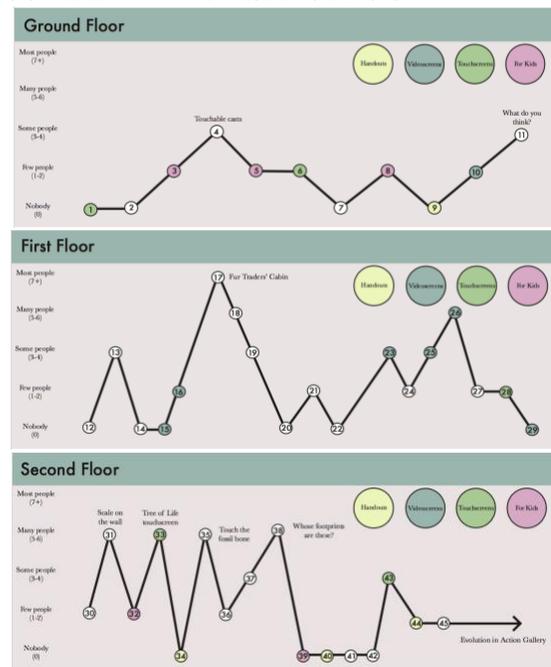


Figure 1: Journey Maps

3.1 Observations

We began this research project by conducting observations within the MSU Museum. These observations were not a systematic investigation designed to contribute to generalizable knowledge; instead, they were a form of program evaluation where we looked specifically at the effectiveness of the existing participatory elements within the museum. We designed our observations so that we were there for a total of five days for two hours each day. The two of us were on separate floors so that we could observe as many participatory elements as possible. During the observation period, we watched the route that visitors took through the museum and noted which participatory elements they interacted with. We also took note of the ways that they were interacting with those elements. All of this data was recorded in our notebooks, and at the end of each day we sat down and compared our notes as we transcribed them into digital files.

The observations gave us a sense of the ways that visitors participate in museum spaces and what participatory elements are the most enticing for visitors. It also gave us a good understanding of the types of participatory elements that the museum had and how effective they were in terms of visitor interactions. This information was invaluable for us as we mapped the number of visitors who interacted with each element on our journey maps. It also provided concrete examples of participatory elements for us to use in our definition guide and rubric.

3.2 Participatory Element Database

We assembled our participatory element database based on the participatory elements located on each floor of the museum. In this database, we labeled the floor number and gallery name of the object's location, the element's name, a brief description of the element, and a few notes where applicable. We also assigned a number to each element in order to uniquely identify it in relation to other participatory elements at the museum.

The main importance of the database is its ability to serve as a reference for our other documents. This catalog is particularly important to the effectiveness of our journey maps because the numbers on the database correspond directly with the journey maps.

3.3 Journey Maps

In order to visually demonstrate a visitor's path through the museum and chart the elements they typically interact with, we adapted the format of a UX journey map to show the peaks and valleys of interaction [Figure 1]. We created maps for each floor as well as a separate map for the museum's "Evolution in Action" gallery because this gallery had many more participatory elements than other exhibits in the museum. The scale of the journey maps is based on the number of visitors we observed interacting with the element. The numbers on the journey map's touch points correspond with each participatory element's label in the database we created.

These journey maps show the range of participation as it occurs on each floor of the museum. At the same time, they also

provide a sense of participation as it occurs in the entire museum. Creating these journey maps was valuable for us as a method of coding our data and being able to visualize participation. At the same time, the journey map format provided the museum with an easily accessible version of our research results.

3.4 Definition Guide

The definition guide [Figure 2] was created to simplify UX terminology related to participation and present it in a visually appealing and informative format. The definitions on our guide are synthesized from the research of Simon and Shirky. We used images from the MSU Museum in order to illustrate a few of the ways visitors can participate within a museum space. These examples cannot account for all of the participatory features that are present in museums or all of the ways visitors participate while at a museum. However, they do demonstrate some of the modes of participation at play in a museum environment so that other museums might consider what participation looks like at their own institution.



Figure 2: Definition Guide

3.5 Rubric

To complement the definition guide, we created a rubric that provides specific guidelines for museums to use as they evaluate their existing participatory elements. Polaine, Løvlie, and Reason explain that, "When you base measurements on the problems and successes people have when they *use* a service, you are better positioned to streamline delivery while improving customer experience" [10, p. 152]. With this in mind, we created questions that measure the visitors' experiences as they use or interact in some way with the participatory element. The questions on the form are informed by the ideas presented by Simon and Shirky [7,

8] related to participation and social objects. To write the questions, we created charts that present the key terms and the questions associated with them [Table 1]. We used these charts and modified the questions so that they were focused on visitor experiences as well as visitor participation. Additionally, all of the questions are presented in a yes or no format because we felt that this would provide museums with more definitive answers about the element’s effectiveness.

As for the structure of the evaluation form, we chose to begin with general questions about the museum’s opinion of participation and its goals in achieving participation. By doing this, museums have the opportunity to reflect on whether their current mentality encourages participatory design. We then included the yes or no questions for museums to answer as they’re evaluating each of their participatory elements. The questions themselves are divided into sections based on the terms provided in the definition guide so that museums can use the guide (and the UX concepts) as a point of reference throughout their evaluation process. In order to make the rubric as usable as possible, we also defined our key terms in each question box and left space for museum staff to write additional notes.

Table 1: Framing Questions for the Rubric

Promise	Tool	Bargain
Why will visitors want to interact with this element?	What will visitors use to participate?	What will visitors do in order to participate?
How is the goal of the design tied to our institution’s mission?	How will visitors interact with the tool?	What points of entry or exit are there for visitors to decide when to begin and conclude participating?
What will visitors get in return for participating?	How does the tool rely on the tacit knowledge of visitors?	

Personal	Active	Provocative	Relational
How might the visitor connect with this element?	How could the movement of this element, or the movement of visitors in relation to this element, lead to interactions with other visitors?	How does this element capture the visitor’s attention?	What parts of this element allow multiple people to interact simultaneously?
How might the visitor connect with the implications associated with this element?		What will surprise the visitor when they interact with this element?	How does this element encourage visitors to interact with each other while still using the element?
What is personally appealing about this element?		What is unusual about this element in the museum space?	
What about this element, and the visitor’s personal connection with it, could lead to interactions with other visitors?		What about this element, and its ability to surprise, could lead to interactions with other visitors?	

Our form concludes with two final reflective questions. First, we ask the museum to rate how participatory they believe the

element they are evaluating actually is now that they’ve gone through all of the questions. This information can be compared to their answer to the same question at the beginning of the document so they can see if their understanding of participation has changed. The final question asks the museum to brainstorm ways to make the element more participative.

4 OUTCOMES

The results of our observations were valuable to us in that we were able to understand the ways that participation occurs in a museum setting. In addition to seeing the ways individual visitors interacted with specific participatory elements, we were also able to understand the social affordances of participation. For example, we noticed that visitors were more likely to interact with a participatory element when they were part of a group of people. These findings informed our development of the definition guide and rubric because we felt it was important to frame these documents around visitor-focused outcomes.

However, we also wanted to ensure that our documents were targeted toward an audience of museum professionals, and we feel that we were able to create actionable documents with the definition guide and rubric. We see these documents being used together by museums (or other organizations and institutions) to evaluate their participatory elements. In this scenario, the institution will have already established that they want to measure the amount of participation and the effectiveness of each participatory element, so the next step is to use the definition guide as a resource for context and definitions and the rubric as a set of guidelines so they can begin to evaluate the element. The information that the museum discovers by filling out the rubric can then be used to “help everyone continue to learn and improve” [10, p. 159]. They will be able to take what they’ve learned during the evaluation stage and use that information to change aspects of the participatory element in order to make it more effective. It will also improve their understanding of participation and assist them when and if they decide to introduce new participatory elements.

5 LESSONS LEARNED

There were several lessons that we learned during our research and the creation of the definition guide and rubric. The first was that time constraints severely limit what you can accomplish. As we were conducting our research, we felt that there were other factors we could have measured in relation to the participatory elements at the MSU Museum. For example, future research could potentially examine how long visitors interacted with certain elements or which elements visitors interacted with more than once. However, due to time constraints, we were unable to incorporate those types of observations into our findings. For this project, our main goal was to create materials that would help museums design and implement participatory elements. We also sought to provide those museums with a formal structure to measure the element’s effectiveness in getting visitors to interact in some way. We were unable to measure that interaction in any

way other than looking at if the visitor interacted with the object/display or not, which means that we were also unable to examine if the participatory element increased the informal learning of the visitor. Additionally, we were unable to test out the documents we created in an official capacity for the museum, nor were we able to incorporate other methods into our research. In the future, we will allocate more time to our research and expand our findings to better suit the needs of museums and other organizations.

The second lesson we learned was that using a combination of research techniques is important, as each method will provide different insights. Although we feel that our observations were effective for understanding museum participation and creating our documents, we believe that additional research techniques, such as surveys or interviews, could have provided further insights into museum participation. We were able to identify the most popular participatory features based on our research methods, but we were not able to talk with visitors to gauge which features were their favorites or which ones they felt they learned the most from. Just as UX research values talking directly with research participants about their experiences, we feel that speaking directly with visitors could have provided more personal insights for the MSU Museum to understand the feelings of their visitors.

Finally, we also learned that it is vital to incorporate UX principles into the creation of your deliverables. One of our biggest regrets is that we didn't have the opportunity to test our rubric and definition guide with the members of the MSU Museum. We feel it would have been effective to observe museum professionals using our documents to evaluate their space. The MSU Museum expressed gratitude to us for our documents and seemed interested in incorporating UX strategies so they could become a more participatory institution. That being said, observing staff members using our tools could have provided more opportunities for revisions. We feel that, in order to truly encompass visitor-centered participatory outcomes, documents designed under the guise of UX need to be tested by the audiences utilizing them in order to benefit both the organization they are designed for and the user. In the future, we are hoping to have the opportunity to put our documents into practice at a museum and use iterative design strategies to make them more useful to audiences in both the museum field and UX more broadly.

6 CONCLUSION

Our research and the resulting documents illustrate how versatile UX is as a discipline. By taking principles related to participation and shifting them from UX to a museum context, we were able to create a framework for museums to use when considering larger participatory concepts such as interaction, collaboration, and conversation. The documents themselves provide tools and recommendations that museums can use when looking at ways to increase participation and improve their participatory elements.

In addition, participation from the perspective of UX acknowledges that user participation is constantly shifting and adapting, since “[p]articipatory projects are like gardens; they

require continual tending and cultivation” [7 p. 338]. This perspective is important because it demonstrates the value of the evaluative tools that we have provided. Museums must constantly evaluate their participatory projects and elements to ensure that they are still efficient and useful for visitors. With technological advancements, new tools are always available to encourage participation, so museums need resources to evaluate their current participatory elements and determine if the new technology would be a better fit and worth the cost to implement. The definition guide and rubric that we created are useful for this purpose because they provide broad guidelines that can be adapted to the situation and element that is being evaluated.

We have adapted UX principles to fit within a specific setting, but museums aren't the only industry that could benefit from this type of treatment. The flexibility of the UX terms and concepts we've defined and illustrated provide opportunities for multiple industries to increase their productivity and encourage active participation. That being said, one of the most important components of participatory design is the mentality that “[p]articipatory projects can only succeed when they are aligned with institutional culture” [7 p. 322]. It is important for institutions to first clarify their goals and their understanding of participation before they begin to implement changes. We hope that our research will provide a potential framework for museums and other institutions/organizations on how to incorporate UX principles into their work in order to improve participation and evaluate participatory projects and features.

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