# GP 1: Project Proposal

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**Overview**

Our project, Museo, aims to improve the art museum experience for visitors. There are a number of problems to be addressed within the art museum space. The first is navigation. Every museum has a different layout, and some have an extremely complicated design. Once lost in a museum, it's hard to orient oneself with a physical map. Additionally, a visitor might be operating under a time constraint. If a visitor has a number of paintings they must see, and a limited time to do it, the best route is not always obvious. Lastly, a visitor might not have a set museum route in mind, but might desire a general aesthetic or genre of painting. There does not currently exist a solution to aid a museum visitor with this type of navigation. Another aspect of the museum experience that could be improved is the information available about each painting. While museum plaques do a decent job at providing basic information, they do very little to satisfy a more curious visitor. Furthermore, most visitors are not art critics and might desire more information about the techniques or formal elements present in the artwork. Allowing users a more interactive experience by allowing them to dive deeper into educational, historical, and biographical information would improve the museum experience. Lastly, an intriguing issue to address is making the museum experience more social. There does not exist a platform for visitors to comment on pieces of art or receive painting or museum suggestions. These three aspects of museums are most troublesome to adult visitors who do not take a guided tour.

Our project aims to address the key observation that, when it comes to technology, the museum experience is not very interactive. To navigate, there are physical maps. To gather more information, there are tour guides. To investigate other museums, there is Google. An interface that compiles all of this information in a succinct, aesthetic way would be extremely beneficial to the user, saving them both time and effort. Museums have attempted to enter the technology sphere and enhance their visitors' experience, but such applications are often poorly designed and are not very widely used. Ultimately, Museo plans to fix that and redefine the museum experience for visitors.

In thinking about these three parts of the museum experience, we formed a number of research questions. What do users find the most annoying about the museum experience? Do users generally see technology as adding to their experience or detracting from it? What do most users go to the museum for? Do they show up with a time limit, a plan, or a tour guide? How often do users find themselves looking up information about pieces of art? What kinds of information do they research? What types of visitors are less likely to get an audio guide or a tour guide? What is the reason for not signing up for a tour guide? Our hope is that in answering these questions, as well as many more, we will develop a well-rounded view of the problems with art museums, and the needs and desires of those who visit them.

## Methods

We will be collecting data on our users using a variety of methods, including observations, interviews, and visiting the Princeton University Art Museum ourselves. All of these methods can provide valuable insights into different aspects of the museum experience. Observing how people navigate the museum, interact with each other, and discover more information about the artwork can be informative in gathering data on what people do in the museum. Interviewing people about the issues that they face when visiting museums, as well as being a museum visitor and experiencing it firsthand would also give us helpful data. We chose these methods over doing a survey because it would be difficult to recruit a variety of people to complete a survey, and we felt like we could gather more useful data by interviewing visitors in person in the art museum proper, where their experiences are fresh in their minds.

For our interviews, we plan on having about 15-25 participants, whom we will interview for about 5-15 minutes each. We chose these numbers because of the relatively low traffic in the Princeton University Art Museum, as well as our endeavor to minimize how intrusive we will be to the visitors' museum experiences. We will ask them general questions about demographics, how often they visit museums, why they visit museums, and about their museum experience, as well as more targeted questions about navigating the museum, accessing information about the artwork, and socializing with others about the artwork. This will allow us to gather data both on the visitors' overall experience of the museum (letting us catch issues which we may not know about) as well as the three problem areas we are focusing on.

The interviews will be done in pairs, with one person asking questions and the other person taking notes. For the observations, we will take notes on how people interact with the museum and on our thoughts and feelings about the artwork and the physical museum space. We will analyze the qualitative data by using an affinity diagram to code the data into different categories and seeing what kinds of themes arise. We will also perform a quantitative analysis by slicing our participant data by certain demographics or thoughts/feelings and analyzing the trends that arise in each demographic, such as the percentages of people in each group who feel a certain way.

## Users and User Tasks

For our user group, we have initially decided to focus on unguided art museum visitors. Visitors who are part of a tour can follow the guide, ask him/her questions about the artwork, and talk with other people in the group, so the three problem areas that we have outlined don't apply to them. As opposed to visitors, we could have also focused on helping tour guides or museum curators/staff. We decided not to focus on tour guides because they are usually very knowledgeable about the museum, and we felt like we could not add very much value to artwork curation, since that is something which requires a trained eye.

Unguided art museum visitors, especially first-time visitors, are usually not familiar with the museum, what kind of artwork is in it, and where the artwork is. Maps can also be difficult to use for those who are not skilled at navigating with them. Audio guides, while sometimes informative, can often be a clunky, limiting, and frustrating way to learn more about the

artwork. Visitors may want to learn about aspects of the artwork that are not outlined in an audio guide (such as the techniques that were used, more details about the artist and time period, etc.) or they may want a more interactive experience that would allow them to engage more fully in the art. Visiting museums is often a solitary activity for people, and audio guides serve to further isolate individuals. Visitors may want to have a more social experience at the art museum and may want to interact with other visitors in order to gain further perspective on the art.

We decided not to limit our user group demographically (such as by age range) before we've gathered data on them. This is to allow issues that may be more salient in a certain age range to naturally surface themselves in our data, instead of having us arbitrarily limit our user group and try to shoehorn our data into our prior assumptions. After gathering data, if we feel as if our user group is too broad and that it would be better to focus on a specific subsection of the group, we will shift our target and do so.

Our users perform a few different tasks that would benefit from a user interface. The first is related to navigation. In order for users to identify a route, they must carefully look at a map. This is relatively time consuming and confusing depending on the complexity of the museum design. For example, most visitors don't carry a pen. In order to outline a route, they must do so by memory. If a visitor forgets to see a piece they had been meaning to see, there is nothing they can do about it. Or, to elaborate further on this example, if a visitor forgets to see a certain piece while they are in that area of the museum and continues their tour, it is extremely inefficient to go back. For a lost user to navigate to another area, it takes multiple steps: checking what room they are in, identifying the room on the map, orienting themselves as to where they should go, and going to the new location. The task environment involves a physical map or, if a user forgets to pick one up, finding a museum guard or tour guide to ask.

The next task a user performs involves gathering more information about a specific piece. This usually involves reading the plaque and Googling the painting. Additionally, this often requires the user to remember a painting, since it is easier to gather more information after the museum visit, rather than right away. Googling a painting is often an involved process because what the user might actually be looking for is a very specific piece of information about the piece of art, or a specific type of information, such as its historical context. To get any sort of user generated content about a certain painting, it would likely take an extensive bout of Googling and scouring forums, so patience and determination would be required. The task environment here is mobile, which is a hard interface to type and do research on because of the small screen size.

The final task a user performs is finding other museums that appeal to them. This has to also be done by Googling similar museums, or knowing exactly what the user is looking for. This task can be greatly improved upon by recommending paintings and museums based on the paintings that a user inputs into their museum route. The task environment here is also mobile.

**Existing Systems and Literature**

We researched and analyzed some of the existing applications at popular museums, including the Princeton University Art Museum, to see how our project could improve upon them.

*MOMA Mobile App*

The mobile app for the Museum of Modern Art in New York City is called MOMA Audio, available for download in the App Store. The app offers an audio guide for a selected number of works in the museum. Once you find yourself in front of a piece that is on the app, you can find it either by name or by its unique code, and then listen in on a couple of minutes of the painting's background, style, etc. The functionality of the app is extremely limited, and this has been reflected by customer reviews on the App Store. The app has an overall 2.5-star review, with most users complaining that it lacks many basic features like maps, visualization, interactive tools, etc. To quote one review:

*"There are no features, no information, no schedules, no relationship to the museum's collection, no film listings, no hours no nothing. At least give us a button to take us to the website, where, one hopes, there is some information for navigating the MOMA."*

*The Met Mobile App*

The mobile app for the Metropolitan Museum of Art in New York City is called THE MET, and it is also available for download in the App Store. This app has a great design – simple and elegant. It is more comprehensive than the MOMA app, since it has information on current exhibitions, events of the day, featured events, etc. However, once you are at the museum, what it does to enhance the visitor's experience is pretty limited. The functionality at this point is pretty much the same as the MOMA app – there is audio for a selected number of pieces, but you have to look for the piece in the app manually, and there is little in the way of maps, visualization, or any other interactive features. In the App Store it has a combined 2.8-star review; the following is a review that sums up most of the complaints users present:

*"This app does nothing to enhance my experience of the place while I'm here… The design is pretty barebones, and the fact that I have to hold the printed map in hand while looking at the app is ludicrous. A GPS enabled "you are here" live map would be a boon to new visitors and old friends alike."*

*Princeton University Art Museum*

The Princeton University Art Museum has no native mobile application that can be used to get information about exhibits, events, or to navigate the museum while visiting. There is an app that can be used to tour the art around campus (sculptures located outdoors), but none that address museum visitors in particular.

**Technical and Social Considerations**

An important technical consideration to have in mind as we start to make design decisions is the challenge that comes from having an interesting demographic mix making up our target user audience. Since we would ideally like an app that is useful for all museum visitors, we must consider the needs and preferences of a wide age range of visitors. Museum visitors include anyone from teens to older adults. Therefore, as we are considering different

features of our design, we want to keep in mind that we are trying to build a product that will be convenient and easy to use for anyone that decides to spend a day, or just a few hours, visiting the art museum.

A social consideration that affects the art museum space is that people generally don't like to be disturbed while they are viewing artwork in a museum. Therefore, an application that makes loud noises or is disruptive to other visitors would not be ideal. In addition, if we choose to focus on creating a more social experience for visitors, we have to make sure that it complements, not detracts, from the artwork. This means that pushing notifications for every message or reply that the user receives (akin to Facebook Messenger) might not be the best way to engage the user.

**Initial Evaluation Criteria**

Our initial evaluation criteria for our eventual design will be judging whether or not our system achieved a balance between improving our users' museum experiences while also not being too overbearing. We want our users to still engage with the art around them, and we hope our design makes that experience more enjoyable. Because of this, our design will hopefully be aesthetic and minimalist; written text should be kept to a minimum. We will also conduct exit interviews with users whom we demo with in order to make sure that we have achieved our goals. The following is a list of initial criteria that we are evaluating ourselves on (more criteria may be added later on as we learn more about our users and our problem space):

- The system should be clear and easy to use, and all of the features of the system should be visible to the user
- The system should contain limited notifications and should not be intrusive to the user
- The design should provide easy-to-access help and documentation, either through a tutorial when the user first opens the application, or on a help page
- If the design provides multiple functions, those functions should be clearly divided so that the user isn't confused and doesn't accidentally access functions they don't want to
    - That being said, the design should still allow users to easily switch between functions, while still maintaining error-proof capabilities

## Appendix A: Interview Questions

### Metadata

1. Date and time
2. Interviewer
3. Note-taker

### Semi-Structured Interview Guide

*Demographics/General Information*

4. What is your name?
5. Age?
    a. 18-25
    b. 26-35
    c. 36-45
    d. 46-55
    e. 56-65
    f. 66-75
    g. Over 75
    h. I do not wish to disclose
6. Gender?
    a. Male
    b. Female
    c. Other
7. Did you come by yourself or with other people?
8. How far away do you live from the museum?
    a. 5-10 min
    b. 10-20 min
    c. 20-40 min
    d. 40+ min
9. When did you decide to come to the museum?
10. How long were you at the museum today?
    a. Start time:
    b. End time:
11. How often do you visit museums?
12. Do you ever use a tour guide?
13. What was the reason for coming to the museum today?
14. Was this visit any different from your other museum visits?
15. What are some distinguishing features of the Princeton University Art Museum?
16. What are some similarities it shares with other museums?
17. Does the museum cater towards a certain audience?

18. What were some things you enjoyed?
19. What were some things you did not enjoy?

*Getting around the museum*

20. Did you have a plan for which exhibits or specific pieces you wanted to see?
    a. If not, did you split up your time walking around, if at all?
21. Tell me about the way you walked around the museum?
22. (If as a group) Did you ever split up? If yes, why?
23. What kind of information did the museum provide you with to help you find your way around?
24. Was it easy to figure out where you were going?
25. How could that have been made better?

*Information*

26. What kind of information is given to you regarding the exhibits and artwork?
27. Do you feel as though the information had a consistent standard throughout the museum?
28. Did you use that information at all?
29. What other sorts of information would you have liked to have known about the art?

*Experience with other users*

30. How was your experience with other visitors? Did you interact with any of them?
31. If you were in the museum by yourself, how would your experience have differed?
32. Were your decisions about which pieces you looked at affected at all by what other visitors were looking at or talking about?
33. Was there any information you wanted to know about how other visitors' visits went?

# ADULT CONSENT FORM
## PRINCETON UNIVERSITY

TITLE OF RESEARCH: *Interactive Museum Experience*

PRINCIPAL INVESTIGATOR: *Professor Marshini Chetty*

PRINCIPAL INVESTIGATOR'S DEPARTMENT: *Computer Science*

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information.

**Purpose of the research:**
The purpose of this research is to investigate how technology can be used to improve the museum experience. In particular, we are focused on the museum-goers. We think that existing forms of accessible technologies such as a smartphones can be used to make the museum experience more pleasant and more enjoyable. Before we develop any hypotheses, it is important that we establish a clear understanding of what the museum-goer experience is like, which is why we need people like you to participate in our study. Your answers will help provide the basis of our research.

**Study Procedures:**
The only part of the study will be an interview we will conduct in person with you. Questions will include ones focused a bit on your background (demographics, why you came to the museum today, with whom), your experience (what were some things you liked/didn't like about today), and some insights you may have into problems (what are some things you would have liked to have had).

Your total expected time commitment for this study is: 5-15 minutes

**Benefits and Risks:**
There will be minimal risks involved. We are collecting personal data such as your name and age, but are not collecting any information by which we could contact you with.

If our research goes well, you could possibly expect some form of solution be implemented by us or someone else that seeks to alleviate some of the problems museum-goers experience.

**Alternatives**
If you are ever uncomfortable answering any questions, please feel free to not answer.

**Confidentiality:**

All records from this study will be kept confidential. Your responses will be kept private, and we will not include any information that will make it possible to identify you in any report we might publish. Research records will be stored securely in a locked cabinet and/or on password-protected computers. The research team will be the only party that will have access to your data.

We will use this data to present our findings at the end of the Princeton Fall 2017-2018 Semester as part of COS 436, a class here on campus. The data will be formatted in a way such that all records will still be confidential.

**Compensation:**

There will be no compensation for completing this interview.

**Who to contact with questions:**

1. PRINCIPAL INVESTIGATOR:


Professor Marshini Chetty
35 Olden Street
Princeton, NJ 08540
marshini@princeton.edu
Physical coordinates: CS 412


2. If you have questions regarding your rights as a research subject, or if problems arise which you do not feel you can discuss with the Investigator, please contact the Institutional Review Board at:


Assistant Director, Research Integrity and Assurance
Phone: (609) 258-8543
Email: irb@princeton.edu


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3. I understand the information that was presented and that:

   A. My participation is voluntary, and I may withdraw my consent and discontinue participation in the project at any time. My refusal to participate will not result in any penalty.

   B. I do not waive any legal rights or release Princeton University, its agents, or you from liability for negligence.

4. I hereby give my consent to be the subject of your research.

Click here to enter text. — Subject's Signature

Click here to enter text. — Date

Click here to enter text. — Person Obtaining Consent's Signature

Click here to enter text. — Date