GP 2: User Research Results and Design Alternatives

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COS 436 - November 16, 2017

Project Description

Museo hopes to come up with a system that improves the museum experience for visitors who do not take advantage of a museum's tour guides. For many visitors, these tour guides are either too expensive or not available. Furthermore, as a group, we felt that the museum experience is thoroughly outdated, providing room for disruptive designs. Using the Princeton Art museum as a case study for the art museum experience in general, we performed research through interviews, surveys and placing ourselves in the shoes of museum visitors. What we found through our research was that visitors tend to have problems navigating museums effectively, acquiring more information about the pieces they view, and finding new exhibitions that may interest them. The designs we mention in this report are geared towards solving those problems.

Requirements Summary

Our systems need to be accessible to a broad range of the general population and augment, rather than interfere, the user experience. Museums are often a place where visitors can escape to, and are typically, quiet areas. Outside of people's footsteps, conversations among visitors, and a tour guide talking, noise is quite limited in museums. This environment allows visitors to spend time focusing on and enjoying the artwork they are surrounded by. That is why it is pivotal that our system allow visitors to continue to immerse themselves in the museum. We want our users to continue to spend time interacting with the exhibitions, and have our system add to that experience by making that experience more enjoyable and stress-free.

Besides maintaining the existing experience of visiting a museum, our system is also required to be used and be used again. If a majority of our users use our eventual system design once and then choose to not use it again, that would mark a key failure of the system. Ultimately, our goal of this system is to grow the number of people who visit museums, which in turn will help museums. While not a requirement for the system, we hope to help museums get more information on the kinds of artwork that interest their visitors so that they can make strides to make the experience more accessible and enjoyable for all.

Finally, our 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, sticking to the theme of not being intrusive to the user. While we hope our system is easy-to-use, it should provide easily accessible help and documentation, either through a tutorial when the user first starts using the system or on a help page. If the design provides multiple functions, those functions should be clearly divided so that the user is not 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.

User Research Summary

Our research at this point has been relatively limited, with all our of data coming from interviewing a few select visitors at the Princeton Art Museum. A key problem with this data was that the users were have been able to interview thus far has been from power users. Our users were members of multiple famous art museums nearby, art professors, or art-history majors. While having a tremendous passion for museums and offering valuable opinions about how they could be improved, our target user group is one that doesn't frequent museums as often as these power users.

The users we interviewed tended to come to the museum for a distinct reason. One elderly couple mentioned that there was a new exhibition that had opened recently that were keen on seeing. Furthermore, we learned from them that, because they were members of certain museums, they received information on new exhibits or pieces appearing at those museums. While not members of the Princeton Art Museum, they mentioned that they tended to keep up to date with any changes to the museum.

However, we still emerged from these conversations with some valuable insights into the museum experience. First and foremost, we discovered that the architecture of the museum plays a significant role in which pieces or exhibits visitors examine. For example, the height of the ceiling in the Princeton Art Museum is higher on the ground and upper floor than it is in the basement. This means that the size of paintings that can be placed in the basement is smaller. Furthermore, the way the stairs contribute to the layout of the museum leads people naturally upstairs, and it often takes a bit of effort for a user to make their way downstairs.

We also found that, to no surprise, users tend to leave their phones in their pockets or bags while they're in the museum. If any of them wanted to look up more information surrounding a painting, exhibit or artist, they typically would write down that down and then look up the information later on.

As we interviewed these power users, we dug more into some of the problems we thought our target users experienced, and found that it was challenging for our power users to figure out which pieces of art they enjoyed at first. They said that, for many new museum-goers, it takes time to figure out which types of art they like. When asked how that period of visiting museums could be improved, they mentioned helping visitors narrow down on their favorites and possibly introduce them to new pieces would be particularly helpful.

Design Methodology

Our design process began during user research. In addition to in-depth user interviews that helped to guide our designs, we also implemented other techniques. We visited the museum and put ourselves in the shoes of the visitors, traversed the exhibitions and decided what aspects of a design would be feasible. We collected the maps and pamphlets the museum offered and re-did our museum experience by following the map and reading the pamphlets. This helped inform us about the information that is already readily available, and allowed us to identify what was good and bad about the existing materials. We also observed museum visitors as they traversed the museum, noting how long they spent at each piece, the route they took, and if they used a map or not. These methods helped us to formulate new design requirements.

Next, we met to design our prototypes keeping a few things in mind. We went around and shared the user research we had gathered. The interviewing process impacted our design process in a number of ways. First, the problems had been slightly altered after the user interviews: namely, we decided to minimize our focus on interaction between museum visitors, since it seemed like users were reluctant to socialize with other visitors both in person and online. Therefore, our new goals were Navigation, Information, and Recommendation, which we wrote on the blackboard to help guide the brainstorm process. We aimed to have each design address one or more of these goals. Another piece of information we learned from the interviews was the fact that most users don't want a cell phone to overwhelm their museum experience. Lastly, we were also able to narrow our target users after speaking to many power users. Power users are experts on the museums they visit, often members of one or more, and they are able to navigate museums efficiently. They would have an easy time finding new museums to go to, since they receive information through their membership. Therefore our target group of museum visitors excluded this group, and our product was aimed at the more naïve visitor—likely a one or two time visitor of the museum. With these new constraints in mind, we developed six designs that we narrowed down to three.

The design process was iterative, in which we put forth ideas, discussed the pros and cons, made modifications, and sketched out each design. Before discussing any idea in depth, we tried to generate as many as we could. Once we could not think of any more, we once again walked through the designs highlighting the problems it solved, and thinking about it from the perspective of the user—identifying advantages and disadvantages. Ultimately, we narrowed the designs down and elaborated on each of them.

Design Space

The design space for trying to improve the art museum experience is very large. We could leverage existing technology that visitors bring into the museum with them, such as smartphones, or we could add technology to the museums themselves. In addition, the technology could provide a variety of functions, such as providing

navigation help, giving visitors recommendations, and getting more information about artwork. The technology itself can take a variety of form factors, such as touch-screens or more physical, hands-on forms.

One of the requirements that would be difficult to realize is making the system clear and easy to use and having all of the features of the system be visible to the user. Even when explaining some of our ideas to our users, they can sometimes have difficulty grasping the essence of what the system is about. Moreover, what may be clear and easy to use for us may not actually be clear and easy to use for some of the people in our target audience, such as elderly people who visit art museums. In order to realize our goal of making a system that would be accessible to a broad range of the general population, we would have to do a lot of user testing with many different types of people. In addition, having a design that is both useful to the user while also not detracting from the main purpose of their visit (to actually see the artwork) could be a tough challenge. We've gotten feedback that people often do not want to pull out their phones while they are looking at artwork, so we've had to try to work around that. We do not want the main attraction of an art museum to be its technology; rather, the technology should be used to augment the viewing of the artwork.

One major tradeoff that we considered is how interactive to make the system. While making the system more interactive would make it more engaging for users, it would also remove focus from the actual artwork. We also had to consider the fact that many users may not be willing to download an application before visiting the museum, and some users go to museums partly to disconnect from technology and the outside world. We had to strike a good balance when considering these tradeoffs in order to make a system that all visitors would be able to use in a nonintrusive manner.

One of the easiest tasks to support would be helping users navigate the museum. Museums already have maps of the different rooms and exhibits, so it would be relatively easy for us to use that data to build personalized routes through the museum that hits upon the art pieces that a visitor wants to see, for example. One of the hardest tasks to support would probably be trying to provide information to the visitors. There are already a lot of existing ways in which people can get this information, such as reading plaques next to the pieces of artwork, using audio guides, and looking up the name of the piece of artwork on Google. It's difficult to think of a nonintrusive way to provide information to the visitor that would provide a significant benefit over using one of these other methods.

We made a few changes to the requirements that we developed in Part 1 as a result of conducting the design process. We realized that we were subconsciously thinking of creating an application in order to solve the problems that we had identified, so several of the requirements seemed to skew towards pertaining only to applications (such as making a system that contains limited notifications), but we still decided to keep general gist of what we were trying to aim for as a requirement (such as being non-intrusive to the visitor). Also, we added a requirement of creating a system that would be enjoyable enough to use that visitors would use it again and again. A lot of the

requirements we had before were focused on usability, so we decided to include one that focuses on the experience of the visitor and making sure that they actually find value in the system that we create.

Design Summary

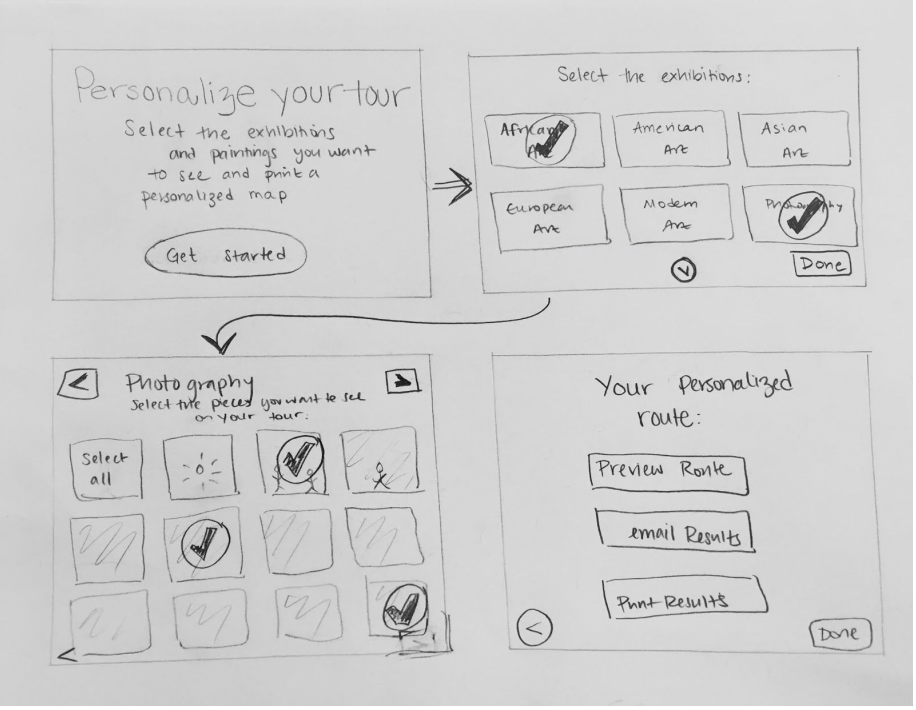
While making design decisions for the project, we tried to limit the number of designs that relied on heavy-use of technology. There were two main reasons for this - the first is that we noticed while visiting the museum to conduct our research that a good percentage of museum visitors were of older age. After talking to them we concluded they were not as comfortable with technology as younger people might be, so having a solution that tailored to this demographic was important. Aside from that, we also received feedback from users that expressed their unwillingness to use technology (mostly meaning their phones) while at the museum, because they felt like this disrupted the overall experience.

For this reason, the designs we present are not heavily reliant on the use of smartphones or other technology, and instead mostly have a physical interaction component. The first design, for example, was initially conceived as a smartphone app, but upon further consideration, we decided to change it to its current design, which takes into account the findings mentioned above (more on this design later).

We also wanted to avoid pursuing ideas that would considerably limit the scope of the project to the Princeton Art Museum. Although we are using the Princeton Art Museum as a case study for this project, mostly because of its accessibility and proximity, we wanted our solution to be easily applicable to other art museums around the world. In this way, the impact of our design will be much greater, since we can target a much larger user base than simply those who visit the art museum on campus.

Finally, we stayed away from designs that would put a heavy burden on the user's time. We found from our research that people visiting museums are often on a tight schedule, and it is important for them to make the most out of the limited time they have to tour the exhibits. Therefore, we theorized that users would have a much harder time adopting time-consuming solutions, that could significantly decrease the time they have to actually spend seeing the artwork. All of our designs reflect this fact, and present quick and intuitive ways to improve user experience.

The Designs



Design 1: Custom Map for Museum Visitors

The first design we propose primarily addresses the issue of navigation, and customizing the museum experience to each visitor. As the most basic prototype, the interface comes in the form of a kiosk that will be at the entrance of the museum. Users will be prompted to begin, and will see a list of all of the current exhibitions. They will have the ability to click on an exhibition or search for a particular work of art or exhibition. Once within an exhibition, the user can select certain art pieces they wish to visit on their tour of the museum, or select the entire exhibition. After successfully selecting all of the works of art that the user plans to see, they can choose to preview the results and either email or print the map. The results will be a map of the museum with the selected pieces clearly labeled and a route from the kiosk that optimizes time and distance.

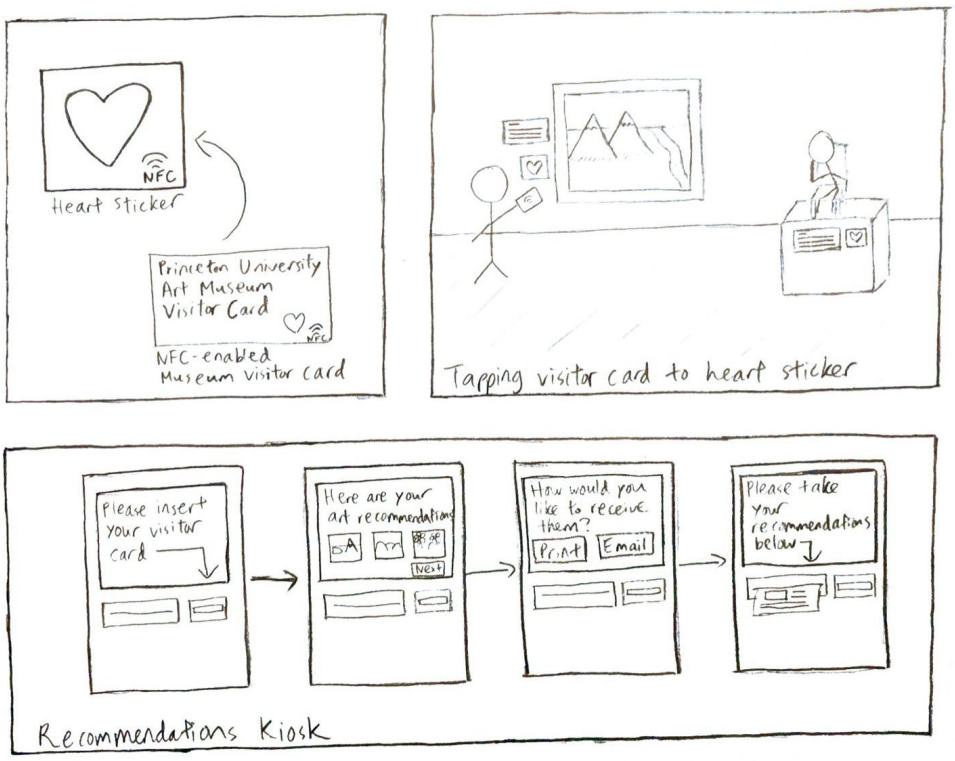
We have also considered a number of features that the design could implement as well. One is combining the idea of additional information. For each piece of art the user selects, the final product could also print a pamphlet in the order of the route with additional information about each piece. This could also be done electronically to save the cost of printing an additional pamphlet. Additionally, some sort of recommendation system of paintings could be implemented whereby the user is able to see “similar paintings” when they click on a painting to select it. This allows the user to find out about paintings they may want to see that they did not know about before. There could also be the option of formulating this map ahead of time through the museum’s website, so a

user does not waste any time at the museum. The following is a scenario from the user's perspective.

As a tourist user, I want to see the most famous painting the museum has to offer as well as some personal favorites in a limited time. As a tourist, I have not traversed the museum before, and may be in a new city or country. Let us say, I enter the Louvre, a very large museum. I knows that I only have two hours, so I can only see a limited number of paintings. I know that I want to see all of the major paintings, but I also have a love of sculpture, and therefore want to make sure I see the Ancient Greek, Roman, and Egyptian sculptures that the museum holds. Furthermore, I love Caravaggio, and want to make sure I see all the paintings by him. First I go up to the kiosk, and tap "begin." I know I want to see the major paintings, so I click "masterpieces," which is listed with all of the other collections. I select all for this exhibit. Then I select Greek Art, and scroll through selecting the sculptures that look interesting to me. I do the same for Roman and Egyptian Art. Next, I search Caravaggio. I notice three paintings come up, so I select all three of these paintings. I project that this, along with the extra time I will spend observing other paintings along my route, will take up the full two hours, so I decide to print my museum. The tour begins where I am standing, and I traverse the museum in the clearly labeled order.

There are a number of advantages of this design. One of the advantages is that it clearly addresses the problem of navigation. Since it is a kiosk, and users can print the map, it can be as similar or different to the existing map system. Users who don't want to use their phone in the museum can print their map, and more tech savvy users can look at the map on their phone. Another advantage is that users can browse art work and create a route based on things that look interesting to them, without losing time from wandering the museum in search of new pieces. Another overall advantage is that having a plan in a museum and a route that eliminates backtracking will allow users to be more efficient. One disadvantage is that it takes time to do this. If a user has a ton of pieces they want to see, it will take a while to select all of the pieces and may take the machine a minute to come up with the route. If the user is short on time, this disadvantage may outweigh the benefit of a faster route.

Furthermore once too many pieces are added, the route might be more complicated and difficult to follow than just walking through the museum without it. It also uses paper if users decide to print it, so there is a resource cost to the museum.



Design 2: A Ticket that Loves

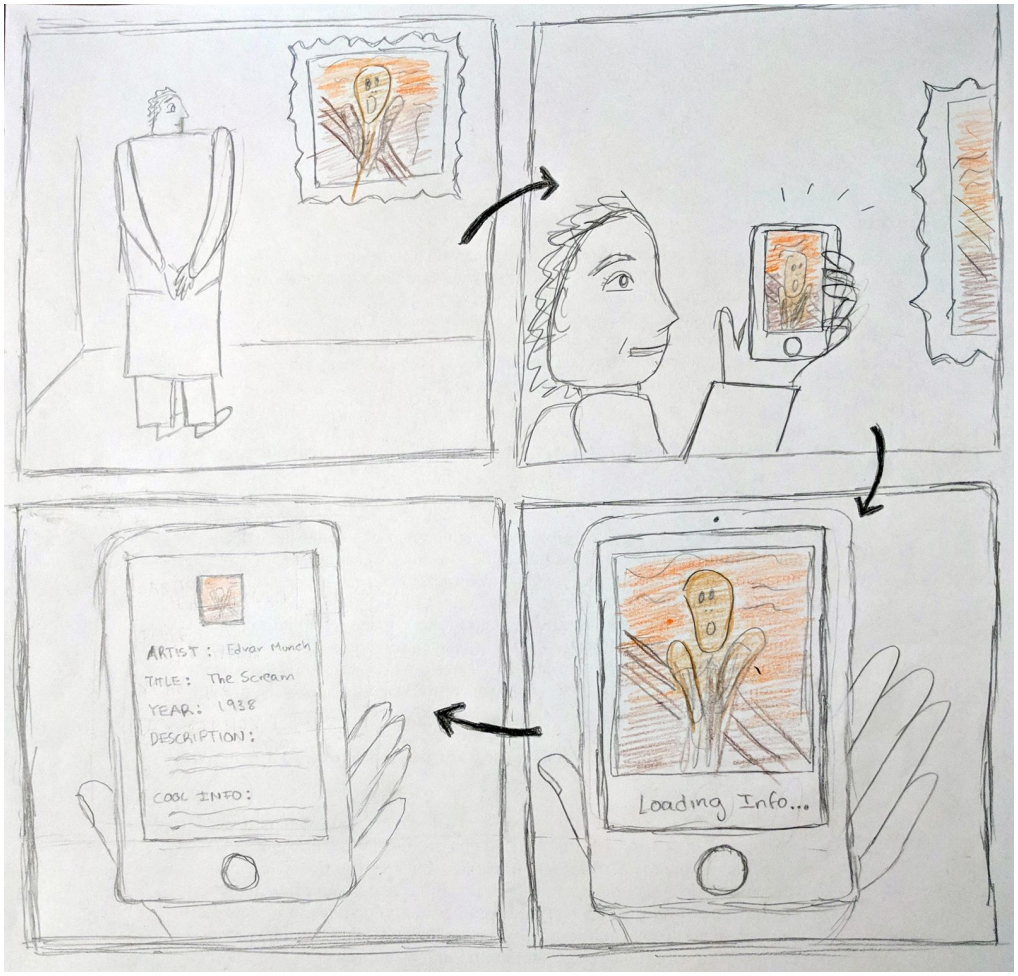
Our second design aims to address the problem of how visitors find recommendations on what art pieces and exhibits to visit next. The way it works is that when a visitor first enters the museum, they would be handed an NFC-enabled (Near Field Communication) visitor card. NFC is a technology that allows electronics devices to communicate with each other when they are brought into close physical proximity with each other. Next to each of the art pieces in the museum, there would be a sticker with a heart on it. When the visitor sees art pieces that they like, they would press their visitor card to the heart sticker. The sticker would then provide some sort of feedback (like maybe lighting up), and the like would be registered to the visitor's card. At the end of the visit, the visitor would be able to insert the card into a kiosk, which would then display recommendations for what to visit next based on what the visitor liked. The visitor would be able to view those recommendations, as well as print them out or email them to themselves.

A scenario of use could operate like the following: I am a person who visits art museums every once in awhile. While I enjoy looking at artwork, I am also kind of a novice and don't really read up on artwork or follow it when I am not visiting museums. I sometimes have a hard time knowing what kind of artwork to see next, and what kinds of exhibits would be interesting to visit. During my visit to the Princeton University Art Museum, I received a visitor card that served as my ticket to the museum. I also got a small leaflet that told me what it was used for. I saw a few impressionist paintings by Van Gogh and Monet that I really liked, so I tapped my card onto the heart stickers next to

each of these paintings. At the end of my visit, there was a booth which I used to return my visitor card, and it showed me the paintings I liked, as well as recommendations for artwork that I could see next, both in this museum and in other museums. I printed out this recommendations list, which I perused over in detail when I went back home, and now I've planned additional trips to the Met and the MoMA.

Overall, this design has a lot of potential and was the most well-received when we presented it at the poster session. It's advantageous because it is a relatively low-tech way to integrate technology into an art museum, and is not as distracting as pulling out a smartphone. It augments the user experience in several ways: not only does it allow a visitor to get art recommendations, but it also allows them to see what other visitors have liked before and are currently liking now. This is a unique way to gauge the pulse on what other visitors think about the artwork, and provides a semi-social atmosphere that is interesting to have but does not distract from the artwork itself. It is also an experience that would encourage visitors to use it again and again; it provides a good way to increase interactivity between the visitor and the artwork. It seems as if our requirements would be met well by this design.

During the poster session, people commented on how they have never seen anything like this before, and that they think it would be really fun and interesting to use at a real museum. They've also mentioned that it could be a good way to record the pieces of artwork that a visitor likes so that they can find out more information about them after the visit. The one disadvantage of this design is that it could be costly or difficult to implement in practice—if a museum is very large and has lots of artwork (like the Louvre), placing a heart sticker next to every piece may require a lot of money and effort to do. However, if the cost of each sticker is low enough and the value that the system provides to visitors is great enough, it is certainly not infeasible to do.



Design 3: Information from a Picture

Our third design gives museum visitors the ability to quickly and conveniently access more information about any painting in the museum. The design consists of an easy-to-use mobile phone app that prompts the user to take a picture of the artwork they are looking at and want to learn more about. The app then takes this picture, and uses image recognition tools to identify the artwork, and then display curated information on it. The information consists of everything from basic title and year the artwork was produced, to more detailed explanations of its historical context, inspiration, technique, etc. Once the user has finished reading about the painting, he/she can simply tap ‘Done’, and the app will transition back to the main screen where one can continue to take pictures of other pieces. All paintings the user snaps a picture of will be saved under the ‘Favorites’ tab, which allows easy access in case the user wishes to continue reading about them after the museum visit.

Let’s imagine I am visiting the Metropolitan Museum of Art on a weekend trip to NYC. I have been to the Met before and although I am an avid fan and museum goer, I would not consider myself an expert. Today I decide I want to visit the European Paintings Wing of the museum - more specifically, 19th century European painting. I make

my way there and soon find myself fascinated by Van Gogh's *Cypresses.* Van Gogh's characteristic thick brushwork conveys emotion through a simple landscape. I read the plaque on the side of the painting - a short description of Van Gogh and where, as well as when, he painted *Cypresses* - but I find myself wanting to know more about the work, Van Gogh's life, and the inspiration behind this melancholic tree. I take out my phone and use the museum app to take a picture of the painting. Immediately, the app recognizes the painting as Van Gogh's *Cypresses* and outputs relevant information on both Van Gogh's career as an artist and his motivation behind this particular work. I learn that Van Gogh was never famous during his lifetime, and it is believed he only ever sold one of his paintings while he was still alive. His life was dominated by depression, and *Cypresses* was one of the last paintings he completed before committing suicide. Some art experts believe that the melancholic dark green tone of the lonely cypress tree is meant to convey his crippling mental health towards the end of his life. I look back at the painting and suddenly the thick brushstrokes convey much more than they did before.

This design is an attempt at solving the problem of providing museum goers with thorough information about an artwork while they tour the museum, as a way of enhancing their learning experience. When we interviewed users, we frequently heard that they enjoy learning more about pieces and artists they like - more than what can be written on the small information plaque most museums have on the side of each painting. They also like to have access to the information while they are looking at the painting, as opposed to once they've left the museum. This allows them to look at the piece and evaluate it in the context of what they've just read. For that reason, this app has the advantage of being a quick and convenient way of finding out more about any particular piece of interest. The app is easy to use and intuitive, and requires little effort by the user. However, this design also has noteworthy disadvantages (it received considerable criticism during our poster session). First of all, it requires users to download the app beforehand, which can be tedious, and only a possibility for those who own a smartphone. Additionally, some users told us that they feel like using their phones during a museum visit disrupts the museum experience itself. For those who take the visit as somewhat of a 'getaway', having to constantly be on their phones to look up information can be deal breaker. Finally, some users argued that they don't think this adds significant value to simply Googling the piece on your phone, which also saves one the hassle of actually having to download the app.