



Baltimore Museum of Art - Final Deliverable

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1 Summary

The Baltimore Museum of Art(BMA) uses GoMobile to provide visitors with the information and the interpretation they need to deepen their understanding of the art on display. This is achieved through a website that's been developed for mobile use only.

1.1 Use Cases

BMA envisions GoMobile in 2 use cases:

1. **In-museum guide:** When a visitor is at BMA, the site can be used to get more information on the piece that they are interested in. When a visitor is in the museum, a visitor looks at the GoMobile logo on the label and realises that the piece can be viewed in the app. Not all pieces are added to the app.



Figure 1: A typical label with the GoMobile logo at BMA

2. **Remote information:** When a visitor is interested in the BMA or has visited the BMA, the site can be used to get some information that they missed or things that they want to review later.

Previously, we conducted a usability study with 7 participants to understand the problems with the website. Based on the problems detected during that testing, we created an interactive prototype to perform a second round of testing with the target user group.

This report includes the details of how we conducted our research, and the results we found.

2 Methodology

This section describes the participants that were used to test the site and the employed testing methodology.

2.1 Participants

The main target audience for this site are museum-goers. Luckily, we had no issues with participant access for this study. All of our users were tested directly on-site at the Baltimore Museum of Art mid-day on a weekend. We sought after individuals who appeared to be walking or sitting alone and were fortunate that our users were friendly enough to cooperate with our usability test when

approached. We also conducted 2 tests with our friends who were visiting the museum.

We were able to carry out our evaluation with a demographically diverse group of participants. In total we had 5 participants. 3 of which were male. We had 3 young participants but varying age groups were represented. The majority of our participants live in the vicinity and had visited the BMA multiple times. Out of the five, 2 users were visiting the museum for the first time.

2.1.1 Demographic Summary

	Gender	Age	Frequency	STL (1-5)	GoMobile/Similar apps?
P1	Female	Young	1st visit	5	Never; Never
P2	Male	Middle-aged	5th visit	4	Never; Never
P3	Female	Older	2nd visit	5	Never; Yes
P4	Male	Upper 20s	Visits often	5	Never; Never
P5	Male	20s	1st visit	5	Never; Never

*STL = Self-Rated Technology Literacy

In order to gather this data, we conducted a small verbal questionnaire prior to each testing session. This allowed us to understand the purpose of each user's visit and their prior experience with technology and similar applications at other museums. Below is the list of questions that we asked each participant:

1. Are you from the Baltimore City area?
2. Age, gender
3. On a scale of 1 to 5 (1=not at all confident, 5=very confident), how would you rate your level of confidence in using your mobile phone for finding information?
4. Is this your first visit to the BMA?
Yes: How did you hear or learn of the BMA?
No: How often do you visit the BMA?
5. What led you to visit today?
6. Have you used GoMobile before?
Yes: Did you enjoy using it? If so, any particular reason?
No: [explain the website] Have you used a similar website or app from other museums before?

Using this questionnaire, we were able to get more background information about our users and understand how this could affect the way they interact with the site. For example, participants that had visited the museum multiple times, already had knowledge of where certain pieces were and therefore would have found it easier to complete some of the tasks.

The full answers to these questions from each participant are included in Appendix A.

2.2 Usability Test

For the second round of usability testing, it was important to accurately test the functionality of our design changes. To achieve this, we built an interactive prototype in Figma. Figma creates an interactive prototype that can be accessed through a browser or through the Figma mirror app. The screenshots of the main screens can be found in the appendix.

While creating the tasks that would be included in the evaluation, it was important that we developed tasks that tested all the major functionalities within the user interface. By going through the GoMobile site, we were able to identify the main interactions that a typical museum visitor will have with the interface. We based the task list mostly off of the first round of testing to keep things consistent while measuring task performance and time performance. We removed some tasks from the previous test which weren't affected by our design changes. We also added a completely new task to test the usability of a potential new feature.

2.2.1 Task Scenario + Task List

You've visited the Smithsonian and the Hirshhorn in DC, but this is your first time visiting the Baltimore Museum of Art. You are curious about what the BMA has on display.

You are in the foyer of the museum, not sure where to begin. You approach the information desk and a worker informs you of the GoMobile site (<https://gomobileartbma.org>) as well as the BMA's latest acquisition of the Sande Society Masks.

You are walking around casually and open GoMobile.

1. Look for the “Sande Society Masks” in African Art.
 - (a) In which Gallery can you find the “Sande Society Masks” collection?
 - (b) Locate the transcripts for the audio file for this piece
 - (c) Find out what pieces are also on view in this gallery

You walk around and have entered Remaking Abstraction (Gallery 1, second floor)

2. Using the map view, navigate to the Generations exhibit on the second floor. Visit Gallery 1: Remaking Abstractions and add “My Grandmother Felt The Color” to your favorites.
3. Using the search feature, navigate back to the “Sande Society Masks”, favorite it and share this piece by email to abc@testmail.com
4. Go to your favorites and email the list to abc@testmail.com
5. Finally narrow down your favorites list by removing “My Grandmother Felt The Color” from the list.

2.2.2 Accessibility

The other group working with BMA will handle this aspect of the study. We have, however, encountered some feedback from one of our users mentioning how the current interface may be limiting to those who are hearing impaired. GoMobile features audio snippets that provide exclusive backstory for each piece. In our improved interface we added a transcript button next the audio player and task 1(b) was designed to test whether users could locate this icon successfully or not.

3 Results

Our field tests took place at the Baltimore Museum of Art with 5 users. On Saturday, December 14th, we tested 3 users and 2 other users were tested on Sunday, December 15th.

Most of our participants were successful with all the tasks given to them. Out of 7 total tasks, 5 tasks had a 100%(5/5) completion rate and the other two had 80%(4/5) completion rate. Compared to the first round of testing, this is a big improvement. We also saw a big improvement in the average time performance for each task. In the first round of testing we saw average times as high as 56.4s but in this round, the average high was only 19s.

3.1 Test Summary

Task	ATP	Success Rate	Observations/Comments
1a	17.4s	5/5	Most users used the big tile on the homepage
1b	10.6s	5/5	Users looked for the audio section first and then the transcript
1c	11.5s	4/5	Users seem to be familiar with the related pieces being at the bottom due to online shopping
2	19s	5/5	Most users were confused by the map icon on the art page but eventually figured it out
3	14s	5/5	All users got through this task pretty easily
4	7.75s	4/5	All but one users were pretty successful in this task. The user who was unsuccessful tried to tap on the art pieces to select them. Can be implemented.
5	8.2s	5/5	All users were comfortable with this task. One user tried to swipe to delete which is a common design pattern.

*ATP = Average Time Performance (successful attempts only)

4 Proposed Changes

Based on the results of our testing, we believe that the following changes are necessary and useful.

4.1 Home Screen and Menu Bar

The current home screen(shown in Figure 2) on the site is a slideshow of pieces at the museum and it is not functional. We believe that having a functional home screen that can act like a dashboard will be useful to the users. When the user feels like they're lost, they can reset by going back to the home screen and having all the functionality of the site on view in a single page.

We also believe that having the developer information in the menu bar makes bad use of screen real estate as it's not used very often. In our first round of testing one user mentioned that the icon was misleading and they believed that it gave information about the museum and not the developer. Due to this, we moved the information in the "i" icon to the home page. We also changed the map icon as some older users confused the old icon with a search icon.

In our second round of testing, we confirmed that most users prefer to use the large tiles in the homepage as it is easily accessible. 4/5 users clicked the search tile to search for something.

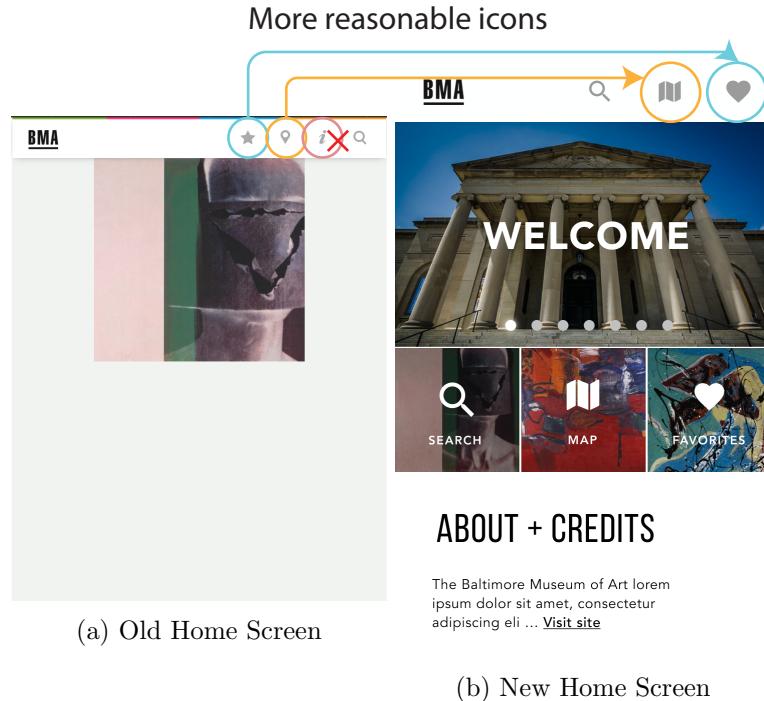


Figure 2: Changes to the home screen

4.2 Search

Previously(as shown in Figure 3), while searching for a piece, the exhibit is displayed but the piece wouldn't show up until the user taps on the screen. This elicits confusion when the user feels like their search has failed or that they typed it incorrectly. This is a functional change that would improve the user experience.

Based on the better time performance for the search task(17.4s vs 40s) in the second round of testing, it's evident that the search functionality we propose is effective.

Interestingly we also found that a lot of users preferred using the dropdown menu items in the search page instead of typing in the search item. We're not sure if this is because our prototype included a fake keyboard and the users didn't like it or if the users prefer navigating manually instead of searching.

4.3 Favorites

Previously(Figure 4), the edit button in the favorites page was non-functional. And for a mobile interface, the button was too small to operate. The new screen attempts to fix this issue by moving the actions and making them more bigger and obvious.

In our testing, only one user had problems with using the share all functionality. The user tried to select the piece by selecting each item and then trying to share all. In our prototype, the only way to select was to click on the box. Perhaps the inclusion of the checkboxes prompted the user to check all the boxes before clicking on share all or the user didn't notice the share all button before

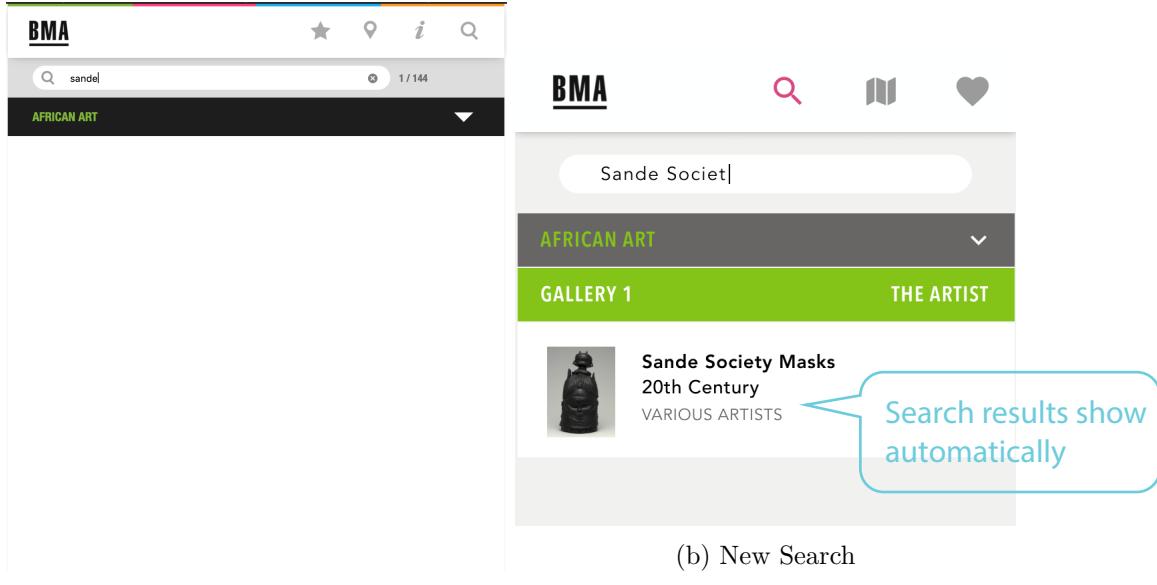


Figure 3: Changes to the Search function

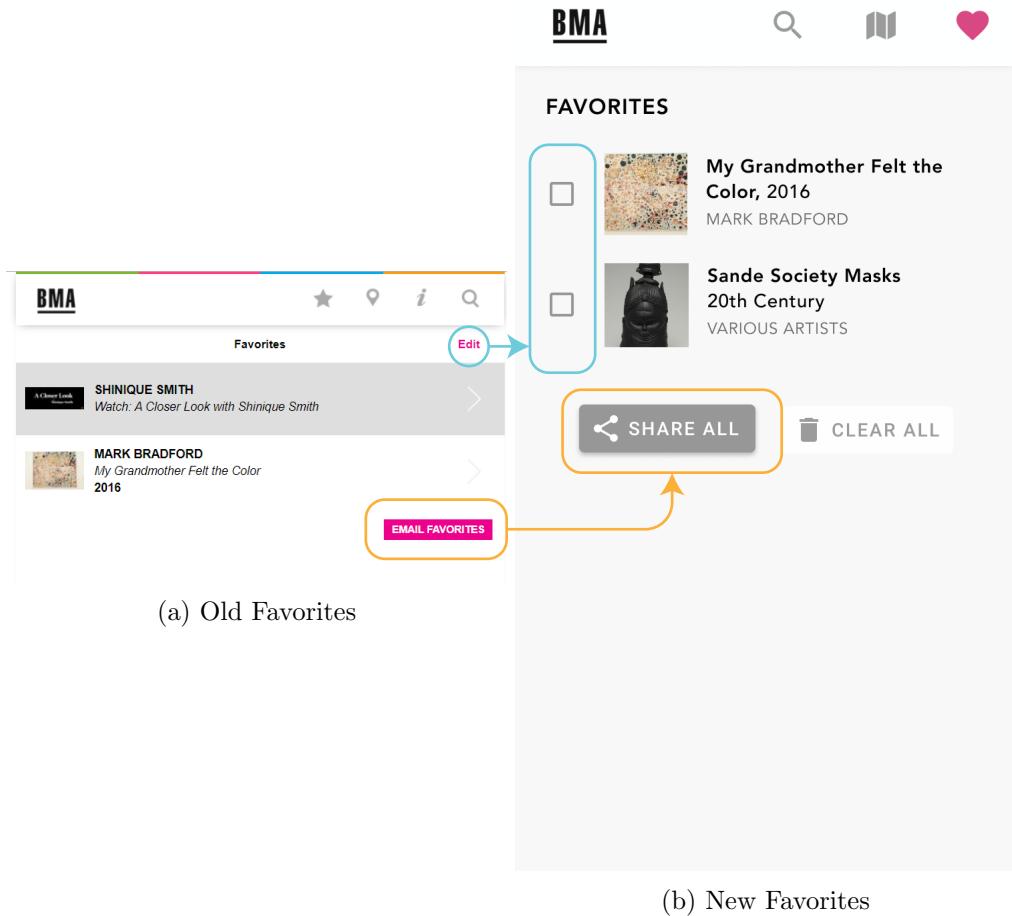


Figure 4: Changes to the Favorites page

trying to select all the items. In addition, no users had any trouble with deleting a piece from the favorites page, thereby confirming that the design was effective.

4.4 Art Page

The art page is the basic building block of the entire site(Figure 5). Previously, the multiple audio files and the arrangement of the share and favorite buttons were not easy to access. The multiple audio players was not only aesthetically unpleasing, but it also increased the amount of scrolling which hindered the UX. We propose to fix this issue by adding a carousel to include all the audio players instead of having multiple players. We also moved the location of the favorite and share buttons to the top of the page where it's more easily accessible. We also moved the additional images to a carousel on top which reduces the amount of scrolling. As seen in the before picture in Figure 5 a lot of the elements are redundant and the new version is more compact.

None of our users had any trouble sharing and favoriting the piece from the art page. The significantly better average time performance(14s vs 54.6s) also suggests that the design change was effective. Although we did run into trouble with having the same icon for the map view and the “locate on map” feature. This can be rectified by replacing the “locate on map” icon with a different icon.

4.4.1 Breadcrumbs



Figure 6: Breadcrumbs

As shown in Figure 6 we also included breadcrumbs in our prototype. This was designed to enable users to identify the exhibit and the gallery the piece is located in, without having to go back and scroll through the list of galleries to figure it out.

In our first round of testing with the original interface, a lot of users had a problem with this task and only 2/7 users completed the task. In the second round with the improved interface, all our users(5/5) completed the task successfully which establishes the effectiveness of the change. Although the task performance was good, we noticed that some users couldn't find this intuitively. Perhaps it's because breadcrumbs are not often used in mobile interfaces and the users are not familiar with the design pattern. We try to fix this issue by including a “Object Location” section which includes a map and the breadcrumbs to help the user understand the location easily.

(a) Old Art Page

(b) New Art Page

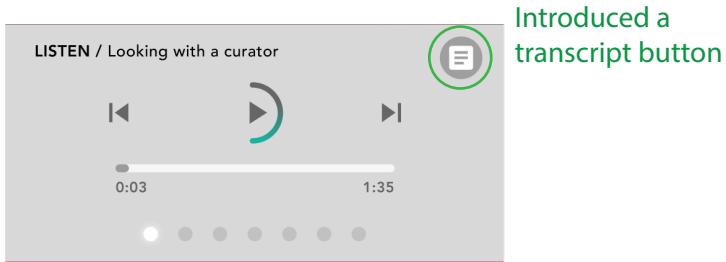
Introduced breadcrumbs

Moved to the top for easier access

Condensed audio players to save space

Figure 5: Changes to the Art Page

4.4.2 Transcript



Introduced a transcript button

Figure 7: Transcript for audio files (top right corner)

We noticed that the GoMobile site uses a lot of audio recordings to aid the viewing experience of the museum-goer. This presents a challenge where a hearing-impaired individual will have trouble accessing this information. We think it's imperative to add transcripts to these audio files. Attempting to solve this issue, we added a transcript icon (top right corner in Figure 7) to go along with the audio file.

To test the usability of the transcript icon, we designed a task in the second round of testing to see if users can locate the transcript. All of our users could locate the transcript icon but we noticed that the users couldn't immediately understand what the icon was for. We fixed this issue later.

4.4.3 Other pieces in the same gallery



Figure 8: A similar design pattern used in e-commerce applications

In the old version, the only way to look at other pieces in the same gallery was to go back to the list view and look at the list of pieces in the galleries. This required the user to remember which gallery the piece was in and to look in that section. We believe that users will be interested in looking at other pieces in the same gallery so we added this section at the bottom of the art page.

We tested the functionality of this feature by designing a task that asked the users to find other pieces in the same gallery. During the first round of testing, 3/7 users failed this task. In our improved interface, all users that were given this task were successful. Most users seem to be familiar with the design pattern of having similar objects at the bottom due to online shopping so they immediately scrolled down to find it when the task was given.

5 Final Interface

Based on the results of our testing, we realised that the only noticeable problems were on the art page. To fix the issues discussed in the section above, we changed the art page(Figure 10) to include a mini-map and we also changed the icon to get rid of the map icon ambiguity. We also included text for the view transcript icon as we noticed that some users initially had some trouble understanding what the icon was for.

We also changed the favorites page(Figure 9) to highlight the share all button due to the problems faced by one user.

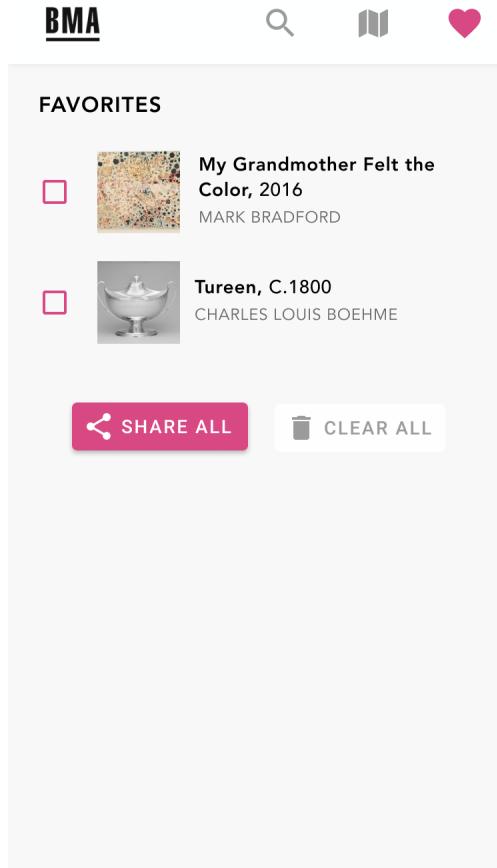


Figure 9: Favorite page after second round of testing

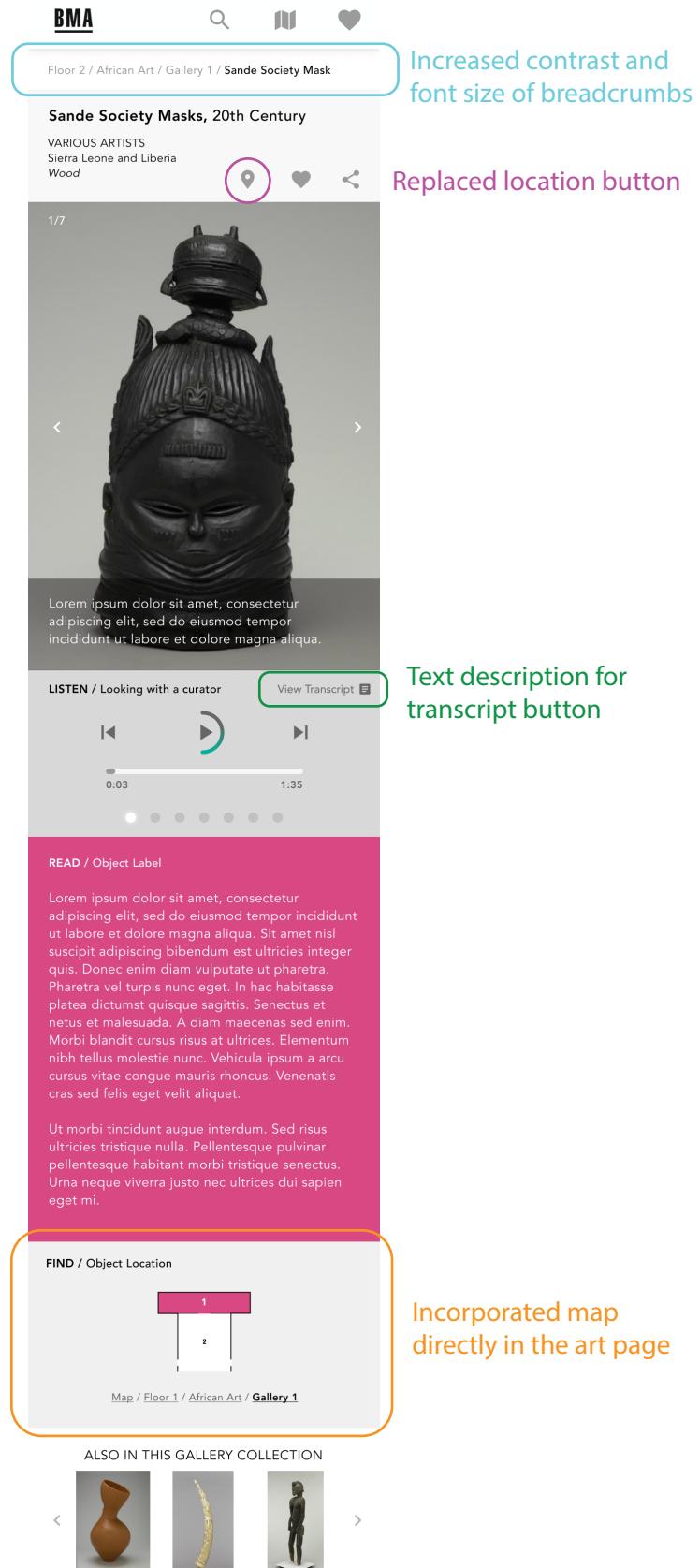
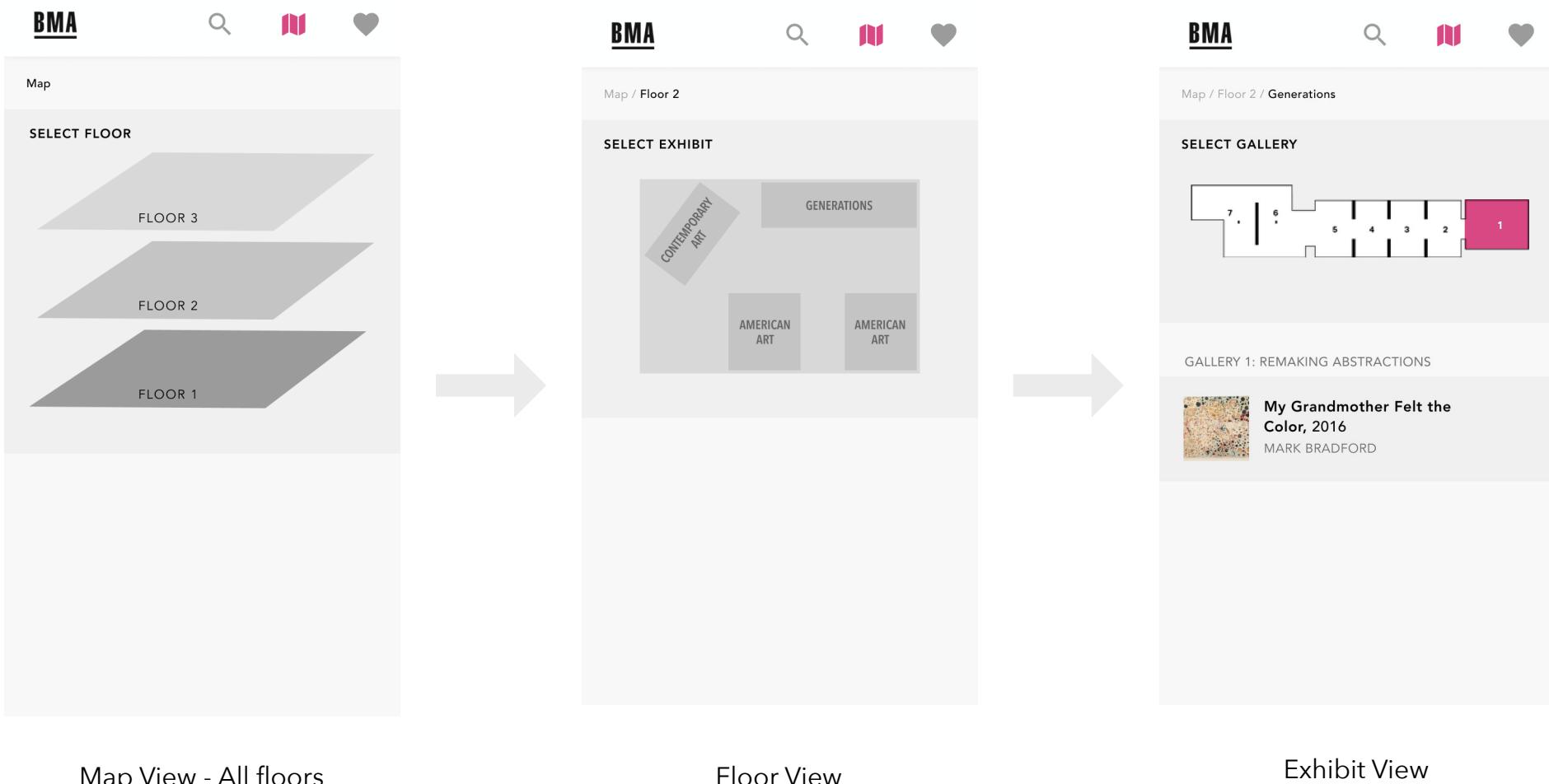
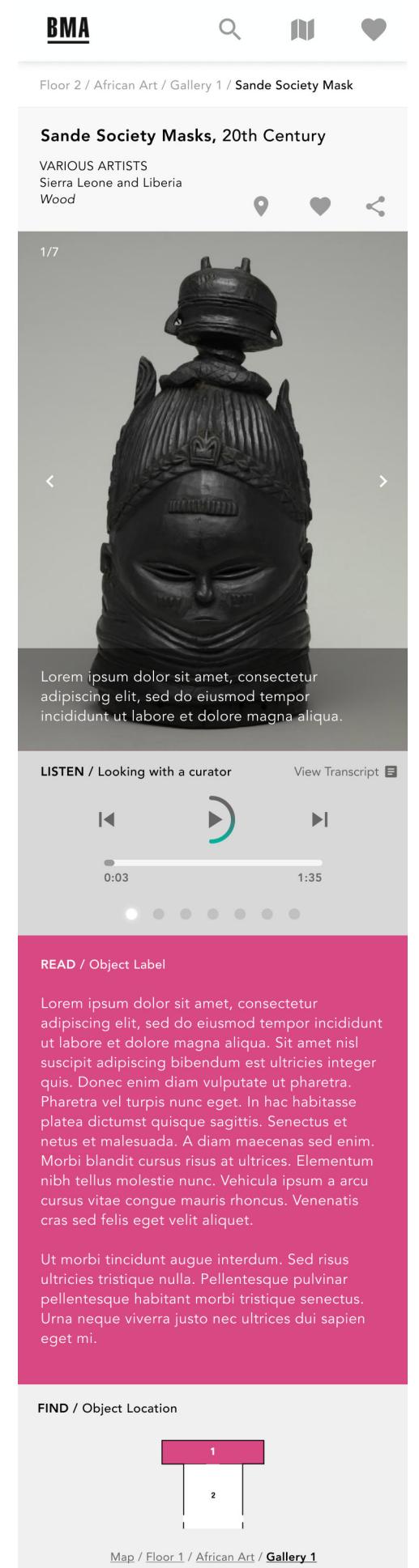


Figure 10: New art page after second round of testing

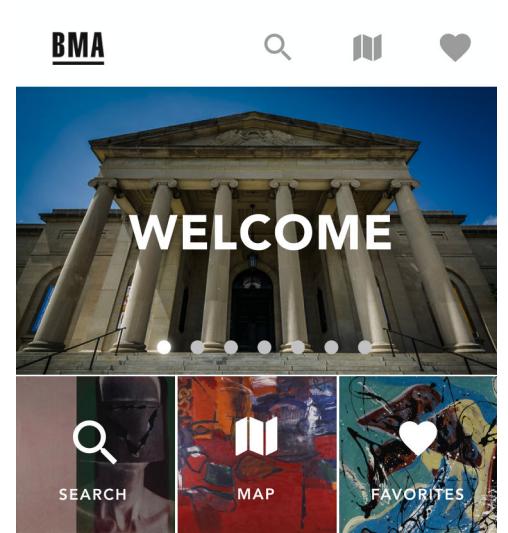
MAP VIEW



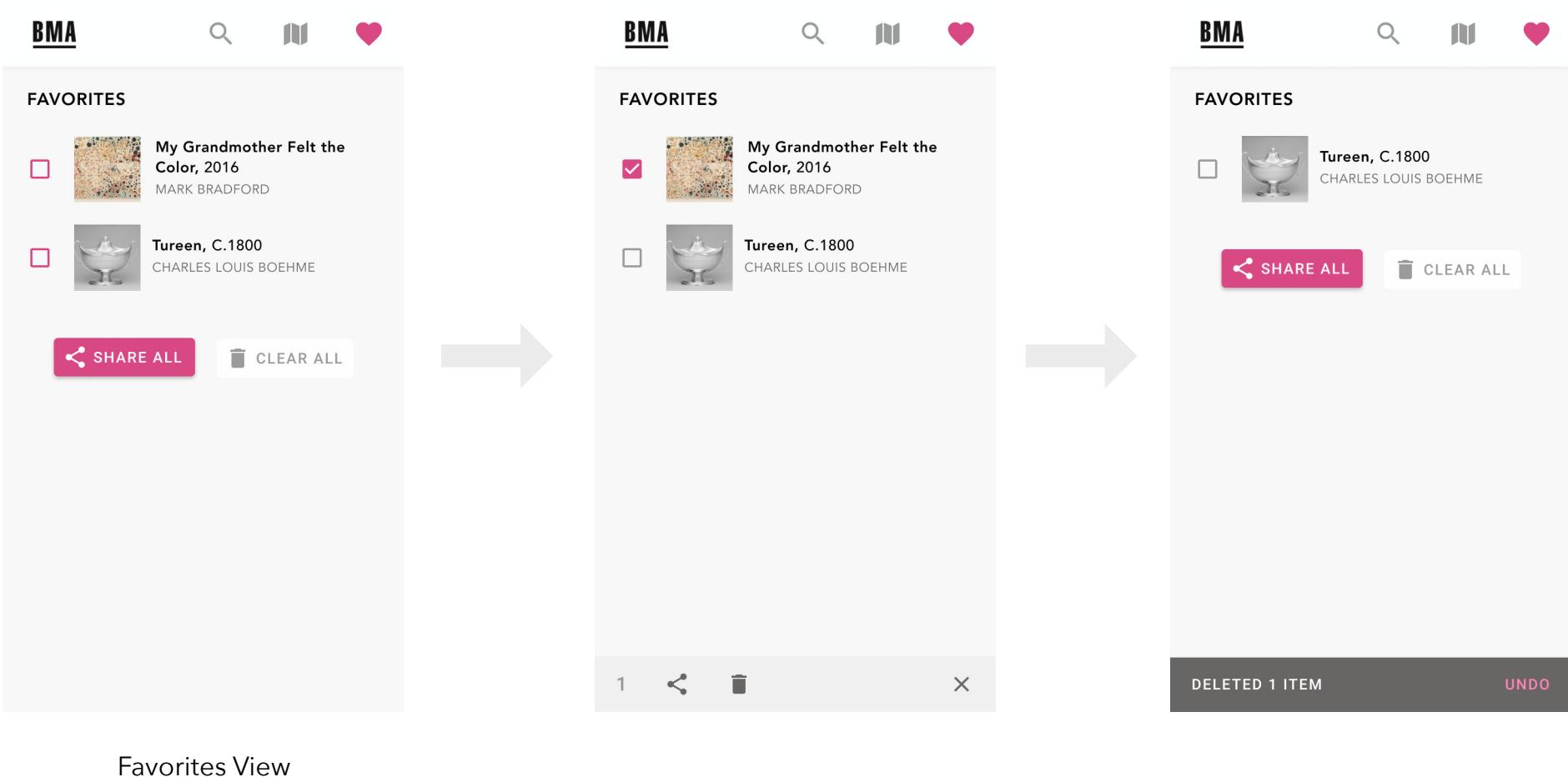
ART PAGE



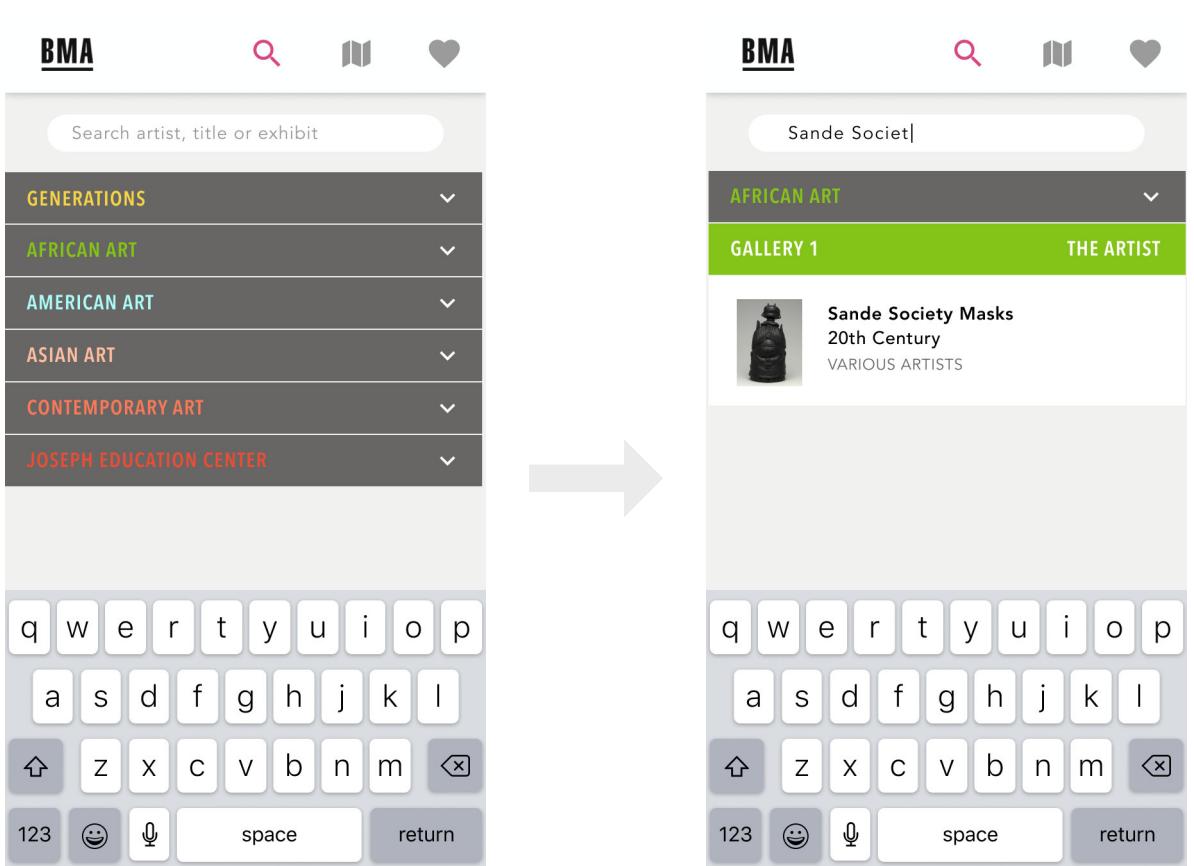
HOME SCREEN



FAVORITES



SEARCH



6 Additional Changes

This section lists some additional changes that we could not test due to the limitations in our scope. The changes are discussed below.

6.1 App vs Mobile Site

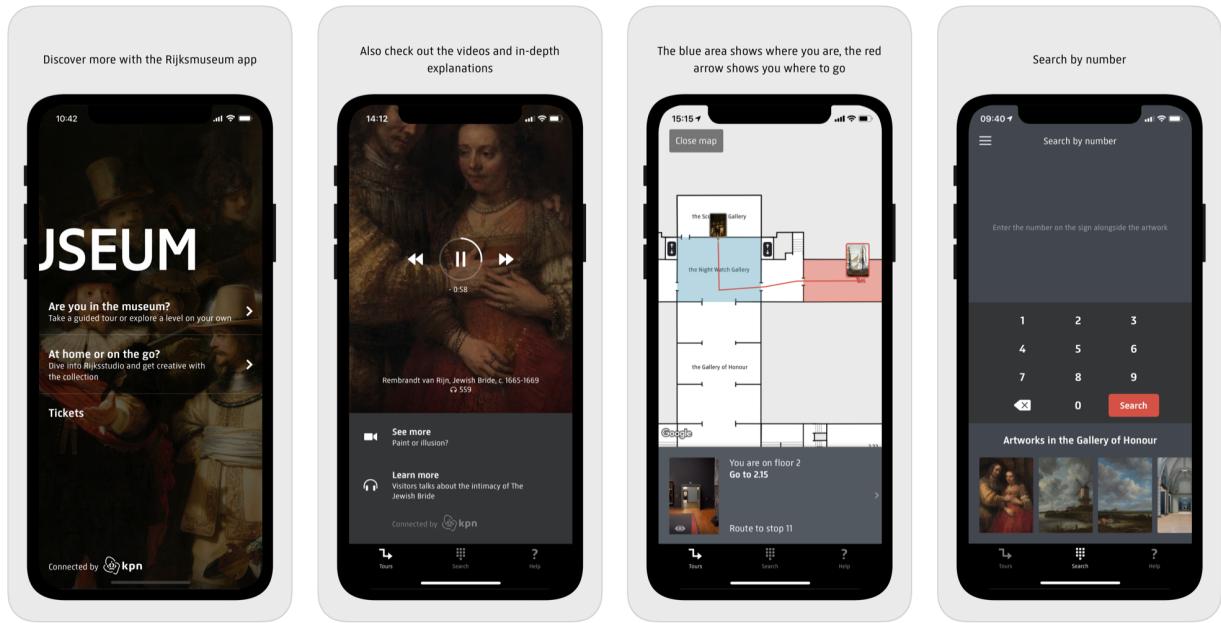


Figure 11: Rijksmuseum App

During our testing we referred to the Rijksmuseum app(Figure 11) to look at interesting design patterns. During this time, we noticed that having a standalone app provides much more functionality than having a mobile site. Having a standalone app allows increased interaction options when compared to a mobile site as its limited by the browser. We understand that this is a major change and the investment to payoff ratio might not be that high. Looking at it purely from a design perspective, having a standalone app provides more freedom.

In terms of functionality, our improved version of the GoMobile app matches the Rijksmuseum app in all places but one. The map experience on the Rijksmuseum app is more detailed due to the fact that it's a mobile app and the interactions can be handled more smoothly. This might not be adequately implemented on a mobile site. The Rijksmuseum also uses a 4-digit code system to locate the piece on the app. The BMA has no such system in place so this functionality cannot be compared.

6.2 Responsiveness

GoMobile has a major visual aspect considering the fact that it's an app for an art museum. The current site is not built using responsive web design principles. This limits the use of the site to

mobile phones and it doesn't make use of large screen devices like the iPad or other similar tablets. Building the site with responsive web design principles in mind can make it more exciting and effective to use on a larger screen.

6.3 Future Scope

GoMobile is built on Drupal which has another interface that staff at the museum use to add content to the website. In addition to making the end-user experience better, there is a scope to study the interface used by the content editors at BMA. Having a streamlined way to add content will help make the whole experience better for both kinds of users.

7 Conclusion

During the first round of testing, we expected the museum-goers to be skeptical about spending time helping Graduate students without getting anything in return. After approaching the first few participants, we realised that this was not going to be the case. Everyone at BMA(visitors and staff) has been incredibly helpful and open to this project. Although we expected this to be the hard part, it was actually realising that sometimes we might not have the right answers. Although we included breadcrumbs to make it easier to find the gallery and the exhibit, the users took longer than we expected.

We also expected this project to be short and quick. Considering the fact that the site had only a few key screens, we expected the project to come to hard stop with a finalized result. After finishing 2 rounds of testing, we now realise that the interface can easily go through another 5 iterations making tiny changes each time. Through this exercise we also realised the problem with assuming how the user is going to behave. We made a few design changes expecting the user to behave in a certain way, but the testing showed us a different picture - highlighting the importance of testing with actual users.

Overall, this project has been a fruitful experience and lesson in understanding the need to test with actual representative users.

“Pretty easy”

- Participant 2

A Detailed Test Results

A.1 Participant 1

Female, Young Lives out of state First time at BMA, found it on Google Rate of technological literacy - 5 Came just to look around Never heard of GoMobile Never used a similar app at other Museums			
Task	Observations	Result	Time Taken
1a	User selected the search from the home page and clicked the drop-down of African Art to find piece. Took some time to find the gallery information	Successful	13s
1b	User attempted to play the audio multiple times and eventually saw the icon for the transcripts	Successful	19s
1c	User went through African art gallery listing and chose a piece	Successful	13s
2	User located map view after some time. Was able to find piece using the map and add it to favorites.	Successful	21s
3	User used drop-down feature again to find art piece and was able to add it to favorites and share it	Successful	11s
4	User was able to click on the share all button and share the list	Successful	9s
5	User clicked on item but saw no reaction and then attempted to swipe(common for apps) to delete. Then found delete icon at the bottom.	Successful	22s
- User found the site easy to use - User did not understand the map icon at first.			

A.2 Participant 2

Male, Middle-aged From the area Been to BMA 4 times Rate of technological literacy - 4 Came for special concert Never heard of GoMobile Never used a similar app at other Museums			
Task	Observations	Result	Time Taken
1a	Clicked on the map icon first on the home screen, then eventually clicked on search and found piece through the drop-down	Successful	22s
1b	Scrolled down and found the icon but took some time	Successful	20s
1c	Attempted to go through carousel of images to find other pieces, then scrolled down and utilized our added feature to identify a piece	Successful	21s
2	User clicked on map icon on the piece page instead of the navigation bar. Attempted to go back, then went back to homepage and clicked on the map button. After user was able to easily find the piece and add to favorites	Successful	37s
3	User used drop-down feature again to find art piece and was able to add it to favorites and share it	Successful	15s
4	User was able to click on the share all button and share the list	Successful	6s
5	User was able to click on the piece and use the delete icon at the bottom of the page	Successful	5s
- User quote- "Pretty Easy" - The icons made it easy to understand			

A.3 Participant 3

Female, Older Lives out of state 2nd visit to BMA Rate of technological literacy - 5 Came for a special exhibition Never heard of GoMobile Has used similar websites before			
Task	Observations	Result	Time Taken
1a	User selected the search from the home page and clicked the drop-down of African Art to find piece. Was able to find gallery information	Successful	26s
1b	User scrolled down and found icon for transcript	Successful	7s
1c	Not attempted	Unsuccessful	
2	User clicked on map icon inside art page and attempted to click browser back button to exit. Eventually had to go back to the home page and click on the general map icon to find the piece and add to favorites	Successful	20s
3	User used drop-down feature again to find art piece and was able to add it to favorites and share it	Successful	14s
4	User attempted to click on each piece and click the share button and did not use the share all functionality	Unsuccessful	
5	User clicked on item and used icon at bottom to delete	Successful	3s
- User found the site easy to use - Had issues going back			

A.4 Participant 4

Upper 20s, Male, has Bachelors degree Lives nearby; from the Baltimore City area Not first visit; visits BMA quite often especially for events Rate of technological literacy - 5 Felt like browsing Had only heard of GoMobile once, but never used it Has not used a museum mobile site like this before			
Task	Observations	Result	Time Taken
1a	Clicked square “Search” tile rather than search icon in upper navigation. Thought it was easier and more convenient to click since it was bigger.	Successful	12s
1b	Seemed like he knew where to look. Scrolled down after instruction and quickly found the icon. Said he recognized the audio transcription icon quickly	Successful	2s
1c	Seemed like he knew where to look. Scrolled down to the bottom of the page.	Successful	6s
2	Thought it was pretty self explanatory	Successful	2s
3	Not much of an issue other than trying to share Sande piece via email (lacking on prototype end)	Successful	20s
4	Used the top nav Favorites icon. Clicked the bottom button: Share All	Successful	9s
5	Clicked square icon left of the piece, then clicked bottom delete button.	Successful	6s
- Thought it was pretty simple to use; “Prototype was not fully functional, but simple enough to accomplish each step” - Thought icons in square tile of Home Page were easier and more convenient to click since they were bigger and closer than reaching for top navigation			

A.5 Participant 5

20s, Male, Currently still an undergraduate student Lives out of state, from DC area First visit Rate of technological literacy - 5 Wanted to check out works available as it was his first time Has not heard of GoMobile Has not used a museum mobile site like this before			
Task	Observations	Result	Time Taken
1a	Used the Search icon from the top nav bar. Reaches for the top out of habit	Successful	14s
1b	It did not take him long to scroll down and find the audio transcription icon. Stated that he recognized the audio section first, then located the icon	Successful	5s
1c	Seemed to understand where to find more pieces. "It's like online shopping where you can locate other items affiliated below."	Successful	6s
2	Clicked onto map icon and clicked around levels. Thought it was weird there was white space beneath layered map.	Successful	15s
3	Did not find this hard to do. Searched with top nav icon and was familiar with tap, share on art page.	Successful	10s
4	Landed on favorites page, pressed bottom button to share entire list	Successful	7s
5	Clicked un-checked checkbox and deleted with the trash can icon bottom bar.	Successful	5s
<ul style="list-style-type: none"> - Overall was very simple to use - Mentioned that breadcrumb links weren't functioning in this prototype as another "back" button. 			