

HCI 440 A6: Prototyping & Usability Evaluation	Your team number: 1
Product Name: MCA Integrated Experience Application	Submission date: 8/25/2019

Card Sort Summary and Report

Note: A PDF of our Card Sort Results is submitted as “HCI 440 A6 (CardSort - Team 1).PDF” for reference

For the creation of the Card Sort, we used the Optimal Workshop website. Our sort had 9 categories. Those 9 categories were called: General, Notifications, Events, Plan Trips, Trip History, Exhibits, Tours, My Favorites, and Map. Our subjects were given 26 cards and they were tasked with matching each card to one of the given categories.

When distributing our card sort, we chose our subjects by sending the Optimal Workshop card sort link to many people including fellow classmates on the D2L discussions, close friends, and relatives with the goal of reaching a wide range of subjects.

After many of our subjects finished the sort, we learned from the results matrix that a consensus category was reached for many of the features. There were a couple that were harder to place for our subjects. For example, an overwhelming number of our subjects sorted the ‘Museum Info’ card in the General category, but some individuals had sorted the same card in either the Exhibits or Tour categories. Additionally, all of our subjects had sorted the ‘Remainders’ card under the Notifications category. Lastly, we couldn’t find a conclusive category for our ‘AR scanner’ card as our subjects placed it under many categories. This made it difficult to place in our navigation map, but we eventually decided to place it under ‘Exhibits’.

Navigation Map

Filename: HCI 440 A6(NavigationMap - Team 1).pdf

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Evaluation Planning

Subject Information

Name: Lian

Age: 27

Occupation: Ad Sales

User type: Infrequent Visitor

User-related logistics:

- Indoor setting with no distractions
- Two laptops on a table - one for running the prototype and one for taking notes

Name: Frank

Age: 57

Occupation: IT Contractor

User type: Infrequent Visitor

User-related logistics:

- Outdoor setting with overhead cover and moderate distraction
- User used the prototype on a laptop and notes were taken on the same laptop after each scenario

Name: John

Age: 26

Occupation: Product Manager Assoc.

Gender: Male

User type: Infrequent Visitor

User-related logistics:

- Performed in an indoor setting with mild distractions i.e. other individuals present and external stimuli
- One (acting as facilitator + observer)
- Subject used the facilitator's computer to complete the usability testing

Name: Eric

Age: 24

Occupation: Unemployed

Gender: Male

User type: Infrequent Visitor

User-related logistics:

- Usability Evaluation performed at indoor setting with mild distractions
- One (acting as facilitator + observer)
- Subject used the facilitator's computer to complete the usability testing
- Card Sort Participant

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Name: Ryan

Age: 23

Occupation: Student

Gender: Male

User Type: Infrequent Visitor

User-related Logistics:

- Evaluation performed indoors
- One evaluator (acting as both facilitator & observer)
- Subject used the evaluator's laptop to perform the usability test

Name: Jose

Age: 18

Occupation: Student

Gender: Male

User-Type: Infrequent Visitor

User-related Logistics:

- Evaluation performed outside
- One Evaluator (acting as both facilitator & observer)
- Subject used their own computer to perform usability test

Task Scenarios

- Imagine you are a student required to write an essay on your favorite exhibits in the Museum of Contemporary Art. You use the MCA Integrated Experience App while at the museum to keep track of your favorite exhibits. You have never used this feature before. Can you show me how you would add individual exhibits to your "Favorites"?
- You are an individual who visits the Museum of Contemporary Art often. You usually look up upcoming events online and write down the dates on your calendar but have forgotten to check it many times. You know there's a way to browse for events and add them as reminders on the app. Can you show me how you would use the app to look for an exhibit and add it as a reminder?

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Measurements

- Total time it takes to complete each task
 - *Reason:* The longer it takes for someone to find a feature in the application, the more indicative it is that the organizational structure of the application is not as intuitive. In addition, the task scenarios lay out critical features of the application which ideally should not take too long to navigate through.
- Count the number of buttons they have to click on to find the feature
 - What incorrect buttons do they click on until they reach the right feature?
 - *Reasons:* Counting the number of incorrect buttons lets us know the extent of how difficult or unintuitive the features are structured. Keeping track of what the incorrect buttons are also lets us get an idea of how most users are expecting the application to be organized.
- Note down any questions users have during the task but do not answer them. Instead ask them to do their best. If impossible, ask them what was difficult about the task and what would make it easier for them.
 - *Reasons:* We want users to figure out the task scenarios themselves but still want to encourage discussion that can help us improve the application.
- Take note of any emotion they may be showing while doing the task (ex: frustration).
 - *Reasons:* Emotions can help us gauge whether the application is enjoyable to use or not.

Logistics

- Notebook Computer with Axure link to prototype
- Paper or typed out notes on observations
- The User Survey can be administered via on the computer or on paper
- Timer to track how long it takes to complete the two tasks

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Evaluation Results

Data Evaluation

- All the evaluations we performed outside of the museum which is not the primary environment we expect MCA Integrated Application to be used.
- Due to time constraints of the deliverable, some of the participants in the usability evaluation were Card Sort participants. This may introduce bias into the testing as they might be more familiar with the organizational structure of the application.
- Administering the task scenarios in different settings for each user may have introduced external stimuli and distractions that affected the time it took to complete the task scenarios.
- Due to all 6 of our participants being one user type (Infrequent Users), there is most likely a bias on what features and functionalities these users find as important or least important. Also, users who are Infrequent Visitors may have less of an idea of what is important in a museum application while those who are Frequent Visitors would have better feedback and suggestions. In addition, Frequent Visitors may be more critical of the MCA Integrated Experience App while Infrequent Users may be more indifferent.

Data Analysis and Presentation

- 5 out of 6 users gave the application an average or above rating in terms of ease of usability
- 3 out of 6 users said the 'Store' feature is the least important aspect of the application
- 3 out of 6 users said the 'Area' map and/or the amenities feature would be the least important aspect to them
- When discussing the Area/Amenities feature, one user commented, "Area – phone and direction icons in the restaurant list. Probably would not do it through the app for outside restaurants. Might use it for inside amenities."
- 5 out of 6 users have used a museum application before this one
- 3 out of 6 users had mentioned the Explore MCA button in the navigation bar is unclear
- 4 out of 6 users believe the navigation bar is fine as is
- 3 out of 6 users mentioned the 'Events' and its related features would benefit from having a button in the navigation bar
- 6 out of 6 users believe adding events to the reminders is intuitive
- 3 out of 6 users mentioned the QR Scanner was difficult to find
- 4 out of 6 users were observed to have difficulties finding the QR Scanner
- 5 out of 6 users mentioned the Store button on the home screen is the least helpful button on that screen

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- 5 out of 6 users stated the 'Buy Tickets' button on the home screen was useful
- 3 out of 6 users stated the 'My Account' button on the home screen was useful
- One user commented, "Future trips are hard to plan without a 'coming exhibits' section"; another user stated, "if you are planning a future trip you don't know what new exhibits will be there".
- One user commented, "I would like to see a feature that lets me share my share my trip planner with another account, so I could plan a trip with friends." Another user stated: "A feature that lets me post a picture to social media would be nice."
- When asked about the events feature, one user stated, "It would be good if the events notifications were used to tell you: 'This event is happening in 15 min.'" That user also stated, "Search Feature(Keywords, events, exhibits, etc.)" would be helpful to have.

Interpretation

- The 'Store' feature was not as important as we thought and may not need a prime button on the Home view.
- 'Buy Tickets' is the big winner on the Home view with over 80% of users finding it useful there.
- The navigation bar tabs were understandable for most users, but they said the 'MCA' tab was unclear and the Events and/or the QR scanner could use a place on the bar. The calendar icon for 'MCA' was not enough of a visual cue.
- Keeping the navigation tab to only 5 items per mobile design conventions may mean 'Area' is dropped in favor for Events or QR.
- Sharing features are lacking for users and could be enhanced with trip plan or photo sharing in the '...' menu of the corresponding trip or exhibit detail.
- A search function could alleviate some of the navigation frustrations.
- The 'Current Exhibits' button on the MCA tab could be expanded to include future exhibits to assist with future trip planning.

Design Changes

- The 'Store' button will be removed from the Home view and replaced with 'Scan QR'. The store will now be accessed within the exhibit detail pages '...' extra functions.
- The title for the 'MCA' tab is changed to 'Explore MCA' to better indicate its function.
- The 'Area' section is moved off the tabs and now accessed through the Trip Planner.
- 'Events' button is moved from the 'MCA' tab to its own tab.
- A 'Future Exhibits' button will be added to the renamed 'Explore MCA' tab.
- Share functions will be more easily recognized with the arrow icon on both the exhibit detail and trip detail views.

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A6 Process Retrospective

During the process of conducting the tasks for the A6 deliverables, there were a few data validity and potential user biases that may have influenced the results of our usability evaluations. Due to the fact that these usability results play an important role in the “Design Changes” section of A6, these issues, listed and detailed below, would have to be addressed and rectified in the next iterations.

Due to all our users falling into one user role, “Infrequent Visitors”, and 5 out of 6 being under the age of 30, nearly all the data we collected would represent only a specific subset of users. Using data from this subset may mean the “Design Interpretations” and “Design Changes” we have stated above may only be beneficial for young, “Infrequent Visitors” to the MCA. They may not be very helpful or even detrimental to older individuals or those who are “Frequent Visitors”. With this in mind, our future iterations would have to focus on collecting participants who represent both user types with consideration for age and gender diversity.

A minor issue with our testing methods that may have affected the results of the usability evaluations is the demonstration of the prototypes on the computer instead of on a mobile phone. Although all the interactive gestures can be done on both mediums, it is less natural to mimic mobile-specific gestures on a computer. Due to this, there’s a possibility that the time it takes to complete each task scenario is influenced by the time spent trying to mimic mobile gestures on a computer. For future iterations, it would be best to create adaptive views for each teammate’s smartphone in order to replicate how the application should look and therefore guide interactions.

Another issue with our testing methods may have been asking users to complete the second task scenario immediately after completing the first task scenario. This could have affected the time it took for individuals to complete the second task scenario as many would be familiar with the organizational structure of the application from going through during the first task scenario. A solution to this issue would be to give users time in between to answer general questions about the first task that doesn’t require any interaction with the prototype. This would hopefully eliminate some “learnability” biases from users memorizing the organizational structure of the application.

Although there are many concerns with our data validity, one of the most beneficial aspects in our usability testing was the User Experience Survey. It offered us insight as to how users felt about the prototype as well as a platform to facilitate open discussion that would otherwise not be possible with just the Task Scenarios.

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Project Retrospective

The application has evolved from the feedback gained from user testing. Each step in the process brought us closer to a useful tool that users would consider before visiting the museum.

The first step in our process was to perform a contextual inquiry on subjects regarding their overall museum-going experience. We interviewed a total of 6 subjects and our aim was to have both frequent visitors and infrequent visitors. However, we quickly realized that our Contextual Inquiry results were skewed since all 6 of our subjects were infrequent museum visitors. With the results of our Contextual Inquiry, we gained the insight that people tend to only use supplementary material if it is convenient or necessary for the exhibit. We also learned that people who do additional research would likely use their smartphones to take notes. Additionally, our subjects use the museum's website to look up events and showtimes but can miss them due to a lack of notifications. We grouped these insights into clusters and developed the following conclusions: People who rarely use audio tours or supplemental information are also smartphone users. People who take notes on their phones tend to look for more information after visiting the museum. The application could be helpful if it notified users of events interesting to them.

One of the beneficial aspects within our project was the Requirements Model, which included our personas, flow diagram and concept map. Creating a detailed narrative for our personas gave us a good idea of their goals and the features that met the needs of both of our user roles. Before completing the Requirements Model it was difficult for us to narrow down what functionalities/features we wanted our application to have because there were no defined requirements for each user role. With the help of the Concept Map and the Conceptual Analysis, we were able to devise a few important requirements to focus on. They gave us guidance on the later deliverables including application performance and structure. The Journey Map for Tina helped us create a story envisioning how most users would use our application. This helped us in both A5 and A6 when we had to determine how to structure the application to meet the expectations of our personas. The Journey Map also helped us identify how our usability results could be biased based on the environments they were done in as some of the testing environments were not reflective of those in the Journey Map.

The Focus Scenarios in A5 Conceptual Design were helpful for us to determine what our critical features would be for the application and what to focus on for our A6 Usability Evaluations. If we did not have the Focus Scenarios, our prototype for A6 could focus on accomplishing too many goals for one iteration. A surprisingly helpful component of our Conceptual Design was the detailing of the Interface Metaphors and Interaction Types. It forced us to brainstorm interfaces for our application that we would otherwise have trouble coming up with naturally. These Interface Metaphors and Interaction Types lent themselves to our prototype in A6. For example, the trip planner interface has its roots in a traditional physical planner. Creating and conducting the initial Card Sort and the Navigation Map in A5 was also helpful as it gave us an

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opportunity to see how we could improve our second iteration of the Card Sort and Navigation Map in A6. Although the Card Sort was very helpful for outlining our Navigation Map and ultimately our prototype's organizational structure, there were some issues with the Card Sort study. A common response from users taking the Card Sort was that they didn't completely understand how sorting seemingly ambiguous features or structures would be helpful. A few users also were overwhelmed by just the act of having to sort things into categories. This is most likely due to the fact that most individuals have never taken a Card Sort study and didn't know what to expect. Although this nature of Card Sorting can't be changed, for future iterations, we could brief users better prior to the Card Sort and also make our items to be sorted less ambiguous.

Lastly, for the final stages of our project, we put together a prototype of our application and performed usability tests with 6 participants. The purpose of the prototype was to create a mockup of our final application with limited feature functionality. The prototype allowed our subjects to try out key features such as: adding events, routing from one exhibit to another, and adding exhibits to their favorites list. As stated previously, the results of our user evaluation tests were biased since we only had infrequent visitors using the application, and some of the subjects had helped with other parts of our project such as the card sort and contextual inquiries. This was mainly due to the time crunch of trying to finish the project by the end of the quarter. Had we given ourselves more time, we would have been able to find subjects who visited museums frequently as well as performing user evaluations on subjects who weren't already familiar with our application.

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Team Member Contributions

Team Member Name	Email Address	Specific Contributions
Sally Chhuon	schhuo2@illinois.edu	Task Scenarios Evaluation Testing Script 2 User Experience Surveys Data Evaluation Data Analysis Process Retrospection Part of Project Retrospective
Santosh Pingali	santoshpingali1995@gmail.com	Card Sort Creation Card Sort Report 2 User Experience Surveys Powerpoint slides Project Retrospective
Nick Naber	nmnaber@gmail.com	Data Interpretation Design Changes 2 User Experience Surveys Editing and presentation of slides Evaluation Report edit

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Appendix

Link to Axure Prototype: <https://tvkb0o.axshare.com>

Filename for Axure Prototype Images in PDF: HCI 440 Team 1 Prototype Images.PDF

HCI 440 Informed Consent Form

Product Name: MCA Integrated Experience Application

Evaluation Team: Nick Naber, Santosh Pingali, Sally Chhuon

As part of the coursework requirements for HCI 440, Introduction to User-Centered Design, our team has created prototypes to evaluate our product idea, MCA Integrated Experience App. This is only a product idea, not a real product.

1. This coursework involves gathering data from this product evaluation to help us understand and improve our product design.
2. The results of this evaluation will help us understand more about this product and how to further develop it.
3. Your help during this test will aid us in making the product easier and more pleasant to use.
4. Your time commitment for the evaluation should be no more than 60 minutes.
5. The facilitator will ask you to perform a series of tasks with the product and think out loud while performing the tasks. The facilitator may ask what is going through your mind, and ask you questions. This will help us understand how easy it is to use this product
6. After completing these tasks, we will ask you to complete a questionnaire about your experience using the product.
7. The facilitator conducting this evaluation knows of no risks associated with taking part in this evaluation.
8. Your data will only be used within the context of this course. Your data will be seen only by members of the evaluation team and the course instructor, and will otherwise be kept confidential.
9. You will receive no compensation for participating in this evaluation.
10. If you have any questions or concerns you may contact the course instructor, Danyell Jones at djones3@cdm.depaul.edu, or any of the evaluation team members: [list team member names, followed by their email addresses in parentheses; e.g., Charles Darwin (charlie@origins.edu)].
11. You may withdraw from the evaluation at any time without penalty.

I have received a copy of this consent form.

I agree to participate.

Participant's Signature: _____

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Facilitator's Signature: _____

Date: _____

Interview conducted by:

Date:

Welcome!

My name is [insert name] and I will be leading your research session today. This session will take approximately 35 minutes to 1 hour to complete.

In our session, we will be discussing your experiences today with the prototype for the MCA Integrated Experience Application. This application is intended to be a companion application for visitors at the Museum of Contemporary Art in Chicago. It provides users features that they would need to have a successful trip at the museum.

We will give you two tasks to complete using the MCA Integrated Experience Application so we can gauge the usability of the application and its organizational layout. This prototype is not a fully functional product but we ask that you simulate the tasks with it to the best of your ability. At the end of your session, we will ask you to complete a User Experience Survey to gain insight on your opinions of the application.

Before we begin, we ask that you look over and sign the Informed Consent Form.

[Note to Facilitator: Give Informed Consent Form to participant. Only proceed when signed]

During the session, notes will be taken on your answers to the questions and your interactions with the application. All notes are assigned a non-identifiable pseudonym and then analyzed by our team members. No personally identifiable information will be associated with the observations taken during the usability evaluation. All notes collected will be used only for research purposes to improve the MCA Integrated Experience Application.

Your participation in the research is completely voluntary. You do not have to answer any questions you do not want to, and you have the right to withdraw from the study at any time. If you want to withdraw from the study, simply leave or state that you wish to end the session. There is no penalty for withdrawing. If you choose to withdraw, your recording and any notes taken will be destroyed.

Today, we will discuss features and functionality as well as the current structure and organization of the application. There are no wrong answers. All feedback is welcomed – the more you talk, the more interesting the session will be, and the faster it will go. We

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will be taking notes as we talk, and I may also ask you some follow-up questions.

Do you have any questions for me before we begin?

FOR FACILITATORS: Measurements to take note of:

- Total time it takes to complete each task
- Number of buttons they have to click on to find the feature
 - What incorrect buttons do they click on until they reach the right feature?
- Any emotion they may be showing while doing the task and what view they are interacting with(ex: frustration, excitement, etc).
- Any questions they may have
 - But do not give them answers or guide them. Have them try their best. If they cannot complete a task, ask them what they felt would've made the task better

Task Scenario Questions to give to Participants:

"I have two scenarios with accompanying tasks for you to complete using the application. The first one is..."

- Imagine you are a student required to write an essay on your favorite exhibits in the Museum of Contemporary Art. You use the MCA Integrated Experience App while at the museum to keep track of your favorite exhibits. You have never used this feature before. Can you show me how you would add individual exhibits to your "Favorites"?

"The second scenario and task is..."

- You are an individual who visits the Museum of Contemporary Art often. You usually look up upcoming events online and write down the dates on your calendar, but have forgotten to check it many times. You know there's a way to browse for events and add them as reminders on the app. Can you show me how you would use the app to look for an exhibit and add it as a reminder?

FOR FACILITATORS: Debriefing Procedures to ask the Participant

- Ask for honest opinions or answer questions they had during the session
- Clarify or go through the correct way to do the tasks if the participant didn't figure it out
- Ask for more details if they expressed any sort of emotion during the session

Give Participant the User Experience Survey below

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User Experience Survey

General Questions:

1. If you were visiting a museum, how capable is MCA Integrated Experience Application in supporting your needs?

1 2 3 4 5
 Extremely Poor Poor Average Well Extremely Well

2. How easy or difficult do you consider MCA Integrated Experience Application is to use?

1 2 3 4 5 6
 Extremely Difficult Difficult Somewhat difficult Average Easy Extremely Easy

3. What feature of our application is least important to you?
4. How does this application compare to other museum or special event applications you may have used?
5. What feature not currently present in the application would you like to see the most?

Specific Questions:

6. How do you feel about the navigational buttons on the bottom of the screen? Which are the most useful? Do you feel there are any that aren't?
7. How do you feel about the task of adding events to your reminders? Are there things that were not intuitive? What would make it better?
8. Were there times that you expected to find something on a certain screen but didn't? Can you recall what they were?
9. Which buttons on the Home screen [the three main buttons on the middle of the screen] are helpful to you? Which are not?

Debriefing Questions for Facilitators/Observers:

- What did users misunderstand from the task scenarios?
- Did anyone ask for help?
- Did they go through the task the way you expected?