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| **Rule of Thumb** | **Is this rule being applied? How so?** | **Is this rule violated? How so?** | **How can this rule further improve usability, utility, and desirability?** |
| 1. Visibility of system status | - The “Buy Tickets” page highlights user’s current selection.  - Scanning reticle on screen to teach user how to properly scan a display item.  - Live map keeps the user updated of their current location and marks sections already visited.  - Status bar displaying the length of audio/video.  - Clock showing time left in tour. | - No prompt for user to notify them of successful ticket purchase. | - Makes user more aware of their ticket selection.  - Makes it easy for a new user to learn how to scan an item.  - Makes the user aware of their current location and helps them save time and avoid confusion.  - User might be on a time constraint which makes the timer more desirable. |
| 2. Match between system and the real world | - Lets the user choose museum by displaying name and image, followed by buying tickets or taking a tour just like in a physical setting.  - Live map updates in real time.  - Shows expected social media platforms when sharing.  - Audio/Videos work in a similar fashion to existing apps. | - User might not realize to swipe to look at related items (A next button might be better). | - Since this a new app, it is important for the user to feel familiar with the system. Moreover, most people might not be familiar with AR which is why it’s important that we avoid using system-specific terms. |
| 3. User control and freedom | - Back button on most screens.  - Option to go to the app home screen, scan an item or look at the live map always available. | - No back button on tickets page.  - End tour button hidden.  - No prompt for user when ending tour.  - User should be able to take and share pictures with a display without having to place the 3D Model onto a flat surface. | -This is useful since it allows the user to achieve their objective and avoid frustration. |
| 4. Consistency and standards | - Same font/style of buttons.  - Similar color scheme throughout the app.  - Static navigation bar. | - Timed tour prompts the user to choose end time but the clock suggests that they are choosing both the start and end time.  - Some images might be cut due to rounded corners.  - Different text sizes and punctuation between “Tickets Page” and “Tickets Page 3”.  -Text on some buttons (Videos and Pay with google pay) is inconsistent and looks off-centre. | - It is important for any app to be consistent in its design. This makes the app more usable and desirable. The user is less likely to use an app with varying fonts/styles. The user should be able to easily figure out the functioning of the app.  - It is also wise to follow platform conventions since the user is used to them. |
| 5. Error prevention | - Scanning reticle and text to make sure user can scan the item correctly.  - A map pointer to show current location to avoid confusion. | - The reticle should be more compact. | - Errors discourage a user from using an application so it’s always wise to do our best to prevent them. |
| 6. Recognition rather than recall | - Text on screen to guide user through the task.  - Help button on most screens to help user with unfamiliar tasks. | - User might not know what “Place 3D Model” means. | - It is important that the user be able to perform tasks smoothly. If they are not familiar with the system (like in this case), it is important that they are prompted with help when needed. This leads to faster learning and can avoid user frustration. |
| 7. Flexibility and efficiency of use | - The scan button lets the user quickly scan an item without having to take a tour.  - The user can use the live map even if they are not on a tour. |  | - Making the app more flexible makes it easier for both new and veteran users to enjoy the experience. It also reduces the number of steps a user must take to achieve a specific task (say scanning for example). |
| 8. Aesthetic and minimalist design | - User can choose to scan an item or look at live map no matter where they are in the app.  - Home screen only shows museum image and name alongside options to take tour or buy tickets.  - Interactive buttons display information about specific parts of the display. | - Text on AR Scanning screen is distracting.  - Duplicate information on scanning help screen.  - Buttons look outdated.  - Color scheme is unpleasant to look at.  - Mixture of rounded and flat icons and design. | - The look and feel of a system are very important since it can attract or repel users. It is important for a user to be able to perform their tasks but also not feel overwhelmed by what they are looking at. In our case, we want the user to be able to enjoy the fun of AR without feeling overwhelmed by new technology. |
| 9. Help users recognize, diagnose, and recover from errors | - Text and overlay are displayed on screen to show user where to place item to scan. | - No error to let user know if a scan fails and how to fix it. | - If a user is not able to recognize and recover from their errors in a relatively new system like ours, they will lean on the side of not using it. It makes a new technology much easier to use. |
| 10. Help and documentation | - The help button on top of screen display information relevant to the task. | - Help button missing in a lot of screens. | - If a user ever gets stuck, it is important that they can access the documentation that’ll help them get out of the situation. This can prove to provide a lot of utility to the user. |