Marathwada Mitramandal's

COLLEGE OF ENGINEERING, PUNE

An Autonomous Institute

Project Based Learning

Title of Project : Virtual Tour Museum App

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Date: **Faculty In-Charge**

CHAPTER 1

Introduction

1.1 Brief Overview of the Project:

- The **Virtual Museum Tour App** is designed to provide users with immersive, interactive, and informative digital museum experiences. It caters to different user groups by integrating AR/VR, personalized recommendations, audio-visual content, and accessible navigation. The app helps users explore art and history remotely while maintaining engagement and educational value.

1.2 Objective:

- The main objective is to design a visually appealing and user-friendly virtual museum platform that offers educational and cultural content in an interactive format. The app focuses on personalization, simplicity, and accessibility to make virtual museum exploration enjoyable for all age groups and tech skill levels.

1.3 Importance of UX :

- Even though the app isn't finance-focused, UX still plays a critical role in simplifying digital navigation, enhancing engagement, and making cultural content accessible. Good UX ensures that users—whether young creatives or older history lovers—can enjoy seamless experiences through intuitive layouts, voice guides, and visual clarity. It removes tech barriers and encourages exploration.

CHAPTER 2

UX Research Report

2.1 Research Methods

- Surveys, Interviews, Competitive Analysis.

1. Interview Guide with Open-Ended Questions

A. For Virtual visitors:

1. How often do you explore virtual museum platforms, and what motivates your visit?

Ans:I visit virtual museum platforms about once or twice a month. My main motivation is to explore art, culture, and history in a way that's accessible from home. I love learning about different cultures and time periods, and virtual tours make it possible to visit places I might not be able to physically go to.

2. What features do you find most engaging in a virtual museum experience?

Ans:I really enjoy interactive features, like 360-degree views of exhibits and clickable objects that provide more information. I also like the option to zoom in on artworks or artifacts to examine the finer details. Audio guides or narration add a nice layer of engagement too.

3. How user-friendly do you find navigating through different exhibits or galleries?

Ans: Most virtual museum platforms are easy to navigate. I usually appreciate clear menus, smooth transitions between exhibits, and intuitive controls to move through galleries or rooms. However, some platforms could improve the flow between different sections, as sometimes it's unclear where to go next.

4. Are there any technical issues you've experienced while using such platforms (e.g., buffering, crashes)?

Ans: Sometimes I experience buffering, especially when trying to load high-resolution images or videos. Occasionally, the platform might freeze or crash, which interrupts the experience. A stable internet connection definitely

helps with this, but it can be frustrating when the platform doesn't work as expected.

5. Do you prefer immersive experiences (e.g., 3D, VR tours) or simpler image/video-based formats? Why?

Ans:I prefer immersive experiences like 3D or VR tours because they feel more realistic and engaging. It's like being physically present in the space, and it helps me better connect with the exhibits. Simple image or video formats are fine, but they don't have the same impact for me.

6. What additional features would enhance your learning or enjoyment during a virtual museum tour?

Ans: It would be great if there were more educational tools, like interactive timelines, quizzes, or a way to track my progress as I explore. I also think a community aspect where visitors can share thoughts or questions would add another layer of engagement.

7. How important is mobile access for you? Would you use a mobile app version of the museum?

Ans: Mobile access is very important to me because I like to explore museums on the go. Having an app would be ideal for a quick, accessible way to check out exhibits, especially if I'm traveling or want to take a virtual break while commuting.

8. Would you like to see gamified elements (quizzes, badges, puzzles) included in the app?

Ans: Yes, gamified elements would be a fun addition! Quizzes or puzzles related to the exhibits could make the experience more interactive and rewarding. I'd enjoy earning badges for learning about different topics or completing virtual tours.

B. For Content Providers:

1. Have you ever used or contributed to any virtual museum or digital archive? What was your experience like?

Ans: Yes, I've contributed to several digital archives. It's been rewarding to share knowledge and artifacts, but managing and uploading content can be a bit time-consuming without the right tools.

2. How suitable do you think a virtual museum is for educational purposes?

Ans: Virtual museums are very suitable for education. They allow for a rich, interactive experience that can engage students in a way traditional methods sometimes can't. It makes learning more dynamic and accessible.

3. What kind of content (videos, articles, images, voiceovers) would you most likely contribute?

Ans:I would likely contribute a mix of images, articles, and voiceovers. Videos can also be useful, but they require more production effort. I focus on content that's visually and intellectually engaging.

4.Are there any tools you'd need within the app to upload, manage, or update content easily?

Ans:I would need an intuitive content management system, with drag-and-drop functionality, easy tagging, and a way to organize content by themes or exhibits. Bulk upload options and version control would also be helpful.

5. Would you be open to hosting virtual lectures or guided tours within the app? What would help support that?

Ans: Yes, I'd be open to hosting virtual lectures or guided tours. A live streaming or webinar tool with features for Q&A, audience interaction, and the ability to share visuals would be essential to support this.

6. How should the app support content quality control or academic credibility?

Ans: The app should have a review and approval system with input from experts in relevant fields. Providing options for peer review or collaboration would ensure that content remains academically credible.

7. How well do you think such an app can integrate with existing educational tools?

Ans: It can integrate well with tools like learning management systems (LMS) and other educational platforms, especially if the app supports content exports or embeds. Having compatibility with platforms like Google Classroom or Moodle would be ideal.

8. What challenges do you force in contributing or using such an app for student learning?

Ans: One challenge is ensuring the content is accessible to all learners, including those with disabilities. Also, time management can be difficult when balancing content creation with other responsibilities. Lastly, ensuring engagement from students in a virtual environment is always a concern.

C. For Administrative Staff:

1. What role would you expect to play in managing or overseeing this app?

Ans: As an administrator, I would oversee user access, ensure content quality, monitor engagement, and manage day-to-day operations, including troubleshooting and ensuring smooth navigation for both content providers and visitors.

2. What features would help you manage user permissions, analytics, or content review more efficiently?

Ans:I'd need a robust user management system with customizable permissions for different roles (e.g., content providers, visitors, reviewers). Analytics features that track user engagement, content performance, and feedback would be very helpful. A content review system with approval workflows would streamline oversight.

3. What kind of technical or user issues do you think might arise, and how should the app address them?

Ans: Common issues might include technical glitches, slow load times, or broken links. The app should have a responsive support system, real-time monitoring, and automated error reports to quickly address issues. Clear FAQs and troubleshooting guides should be easily accessible.

4. Are there any tasks you'd like to see automated in the app (e.g., approval workflows, notifications)?

Ans: Yes, automated approval workflows for content, notifications for upcoming events or updates, and periodic reminders for content providers to update or review their materials would save a lot of time.

5. How should the app handle communication between users (e.g., feedback forms, live support, messaging)?

Ans: There should be an integrated messaging system for quick communication between users and admin, as well as feedback forms for visitors to leave comments. Live support (chatbots or real-time assistance) should be available during high-traffic periods to resolve issues instantly.

6. What data protection or privacy features would you consider essential for an educational museum app?

Ans: The app should comply with GDPR and other relevant data protection regulations. Essential features would include secure user authentication, encrypted data storage, and clear privacy policies. Additionally, giving users control over their data (opt-in for data collection, account deletion, etc.) is important.

7. How can the app be made compatible with existing systems used in your institution?

Ans: The app should have integration capabilities with other systems we use, like Learning Management Systems (LMS), email platforms, or content management systems. APIs and easy data export/import options would make the integration process smoother.

8. What challenges do you foresee in maintaining and scaling the virtual museum platform?

Ans: As the platform grows, maintaining content quality and consistency might become more challenging. Scaling user support, ensuring smooth performance under heavy traffic, and managing increased content uploads without compromising user experience would also require careful planning and resources.

2.2 Survey Results & Interviews

- **Survey Insights**
- **User Needs:**
    - **Engagement:** Interactive and immersive features (3D, VR) are important.
    - **Mobile Access:** Visitors want easy access via apps.
    - **Content Management:** Providers need easy upload and update tools.

    - **Academic Credibility:** Content should be peer-reviewed.
    - **Communication:** Integrated messaging and live support are needed.
- **Preferred Features:**
    - **Immersive Content:** 3D, VR, and interactive features.
    - **Gamification:** Quizzes, badges, and puzzles.
    - **Live Events:** Support for virtual lectures and tours.
    - **Data Security:** Secure and private user data.
- **Functional Requirements:**
    - **User Management:** Role-based permissions and user tracking.
    - **Content Management:** Easy tools for uploading, tagging, and updating content.
    - **Immersive Features:** Support for 3D and VR experiences.
    - **Live Event Support:** Streaming and audience interaction features.
    - **Analytics:** Track user engagement and content performance.
    - **Mobile App:** Full functionality on mobile devices.
- **Non-Functional Requirements:**
    - **Performance:** Fast loading and scalable infrastructure.
    - **Accessibility:** Features for users with disabilities.
    - **Security:** Secure login and data encryption.
    - **Usability:** Easy interface and intuitive tools.
    - **Reliability:** Minimize downtime and provide quick support.
- **Interview Summaries**

- **Visitor:**
    - "I love interactive tours, but sometimes I get lost due to unclear navigation."
    - "Buffering disrupts the experience, especially with high-res content."
- **Content Provider:**
    - *"Uploading content is hard without good tools. Bulk upload and easy organization are key."*
    - *"Academic credibility is important—peer reviews would help."*
- **Admin:**
    - "Managing permissions and keeping the platform running smoothly is tough. We need better user activity tracking."
    - "Scaling the platform while maintaining performance is a challenge."

2.3 User Personas

Persona 1: Prince Yadav – The Cultural Enthusiast Professional

- **Demographics:**
    - **Age:** 35
    - **Occupation:** Senior Manager
    - **Location:** Mumbai, India
    - **Tech Savviness:** High
    - **Income Level:** ₹12,00,000 annually
- **Goals:**

    - Discover new exhibitions and historical insights during breaks or commutes.
    - Access detailed audio-visual content.
    - Share findings with friends or on social media.
- **Behaviors:**
    - Prefers quick, immersive experiences via AR/VR.
    - Enjoys smart recommendations based on interests.
- **Pain Points:**
    - Poor app performance in low network areas.
    - Limited interaction or customization options.
- **Motivations:**
    - Culturally enriching, time-efficient experiences.
    - Personalized content curation.

Persona 2: Sakshi Kale – The Creative Young Explorer

- **Demographics:**
    - **Age:** 24
    - **Occupation:** Graphic Designer
    - **Location:** Pune, India
    - **Tech Savviness:** Medium
    - **Income Level:** ₹5,00,000 annually

- **Goals:**
    - Discover inspiring art pieces and exhibits.
    - Save visuals and content for design inspiration.
    - Explore art in interactive, visually appealing ways.
- **Behaviors:**
    - Loves aesthetic interfaces, interactive content.
    - Shares screenshots or takes notes during virtual visits.
- **Pain Points:**
    - Complex navigation reduces engagement.
    - Hard to find specific styles or eras quickly.
- **Motivations:**
    - Visually rich, intuitive design.
    - Customizable tours or art feeds.

Persona 3: Sachin Shetty – The Retired History Lover

- **Demographics:**
    - **Age:** 67
    - **Occupation:** Retired History Lover
    - **Location:** Delhi, India
    - **Tech Savviness:** Low

    - **Income Level:** ₹30,000 monthly pension

- **Goals:**
    - Revisit ancient history and heritage sites.
    - Use the app to teach grandkids or stay mentally active.
- **Behaviors:**
    - Uses app occasionally, prefers larger fonts and audio narration.
    - Engages with educational content or timeline-based navigation.
- **Pain Points:**
    - Struggles with small icons and technical terminology.
    - Confused by too many features at once.
- **Motivations:**
    - Educational yet simple experience.
    - Voice-assist, step-by-step walkthroughs.

User Journeys:

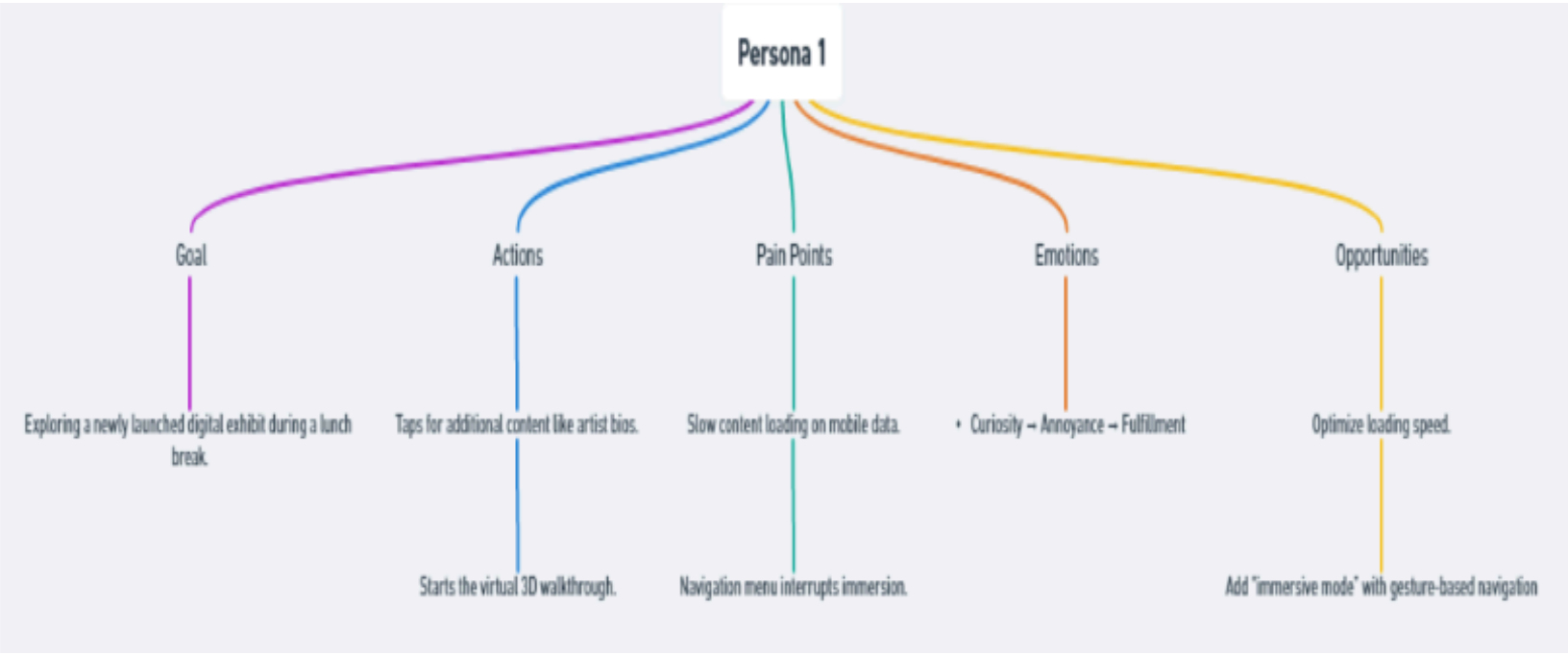
Persona 1: Prince Yadav – Busy Professional on a Cultural Break

Scenario: Exploring a newly launched digital exhibit during a lunch break.

- **Actions:**
    - Opens the app and clicks on “Featured Exhibits.”
    - Starts the virtual 3D walkthrough.

    - Taps for additional content like artist bios.

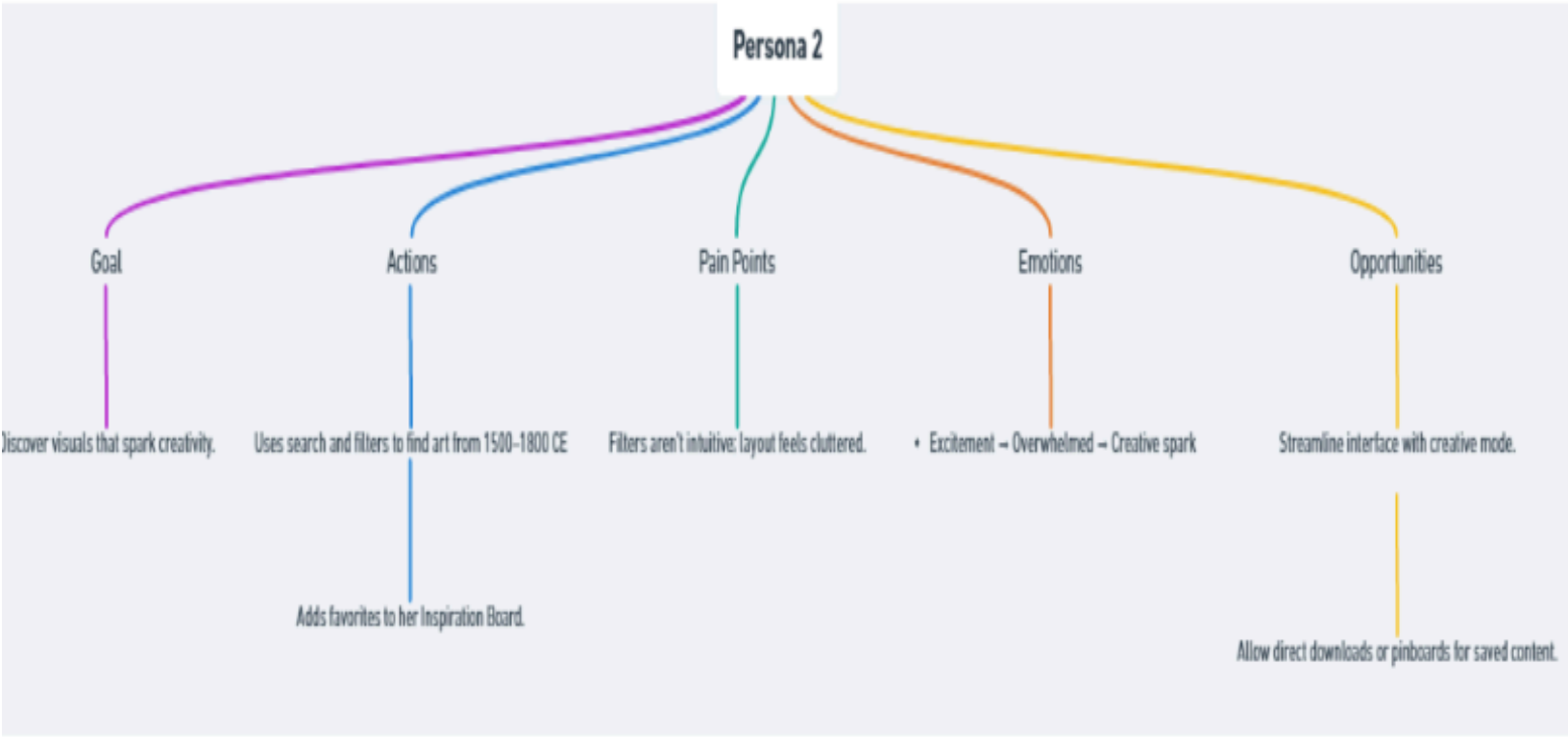
- **Pain Points:**
    - Slow content loading on mobile data.
    - Navigation menu interrupts immersion.
- **Emotions:**
    - Curiosity → Annoyance → Fulfillment
- **Opportunities:**
    - Optimize loading speed.
    - Add “immersive mode” with gesture-based navigation.



Persona 2: Sakshi Kale – Artistic Explorer

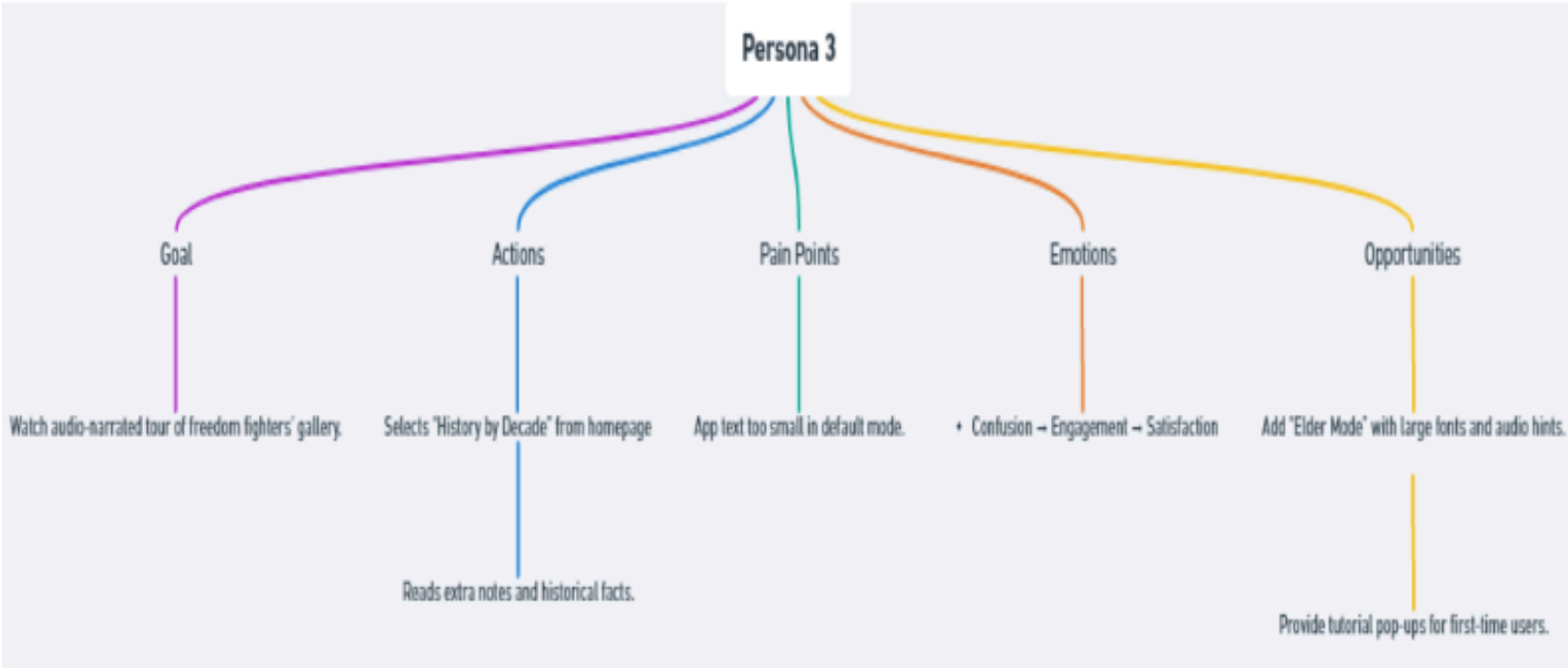
- **Goal:** Discover visuals that spark creativity.
- **Actions:**

    - Uses search and filters to find art from 1500–1800 CE.
    - Adds favorites to her Inspiration Board.
    - Shares a painting with her design group.
- **Pain Points:**
    - Filters aren't intuitive; layout feels cluttered.
- **Emotions:**
    - Excitement → Overwhelmed → Creative spark
- **Opportunities:**
    - Streamline interface with creative mode.
    - Allow direct downloads or pinboards for saved content.



Persona 3: Sachin Shetty – Retired History Buff

- **Goal:** Watch audio-narrated tour of freedom fighters' gallery.
- **Actions:**
    - Selects "History by Decade" from homepage.
    - Starts guided audio tour with large font captions.
    - Reads extra notes and historical facts.
- **Pain Points:**
    - Hard to find the "play" button.
    - App text too small in default mode.
- **Emotions:**
    - Confusion → Engagement → Satisfaction
- **Opportunities:**
    - Add "Elder Mode" with large fonts and audio hints.
    - Provide tutorial pop-ups for first-time users.



Chapter 3

Title: Evaluating an Existing System: Students will perform a UX audit of a popular app or website.

- Use Jakob Nielsen's heuristics to evaluate the interface.
- Identify usability issues and areas for improvement.

Heuristic Evaluation Report: Virtual Museum Tour App

Objective:

This UX audit aims to evaluate the usability of the Virtual Museum Tour App using Jakob Nielsen's 5 selected usability heuristics. The goal is to identify usability issues and recommend improvements to enhance the user experience.

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1. Heuristic Evaluation Using Jakob Nielsen's Principles

Heuristic 1: Visibility of System Status

Description: The system should always keep users informed about what is going on, through appropriate feedback within a reasonable time.

Findings:

- **Issue:**There is no visual feedback when loading exhibits or saving artifacts, which may lead users to double-tap.
- **Screenshot 1:**

  ![Screenshot 1: Blank transition screen between exhibits with no loading indicator.](#)

  Figure 1 shows a blank transition screen that creates uncertainty for users.

- **Recommendation:** Add a spinner or progress bar to indicate that the page is loading, such as "Loading next exhibit...".

Heuristic 2: User Control and Freedom

Description: Users should have the freedom to undo or redo actions, and the system should provide a way to exit from unwanted situations.

Findings:

- **Issue:**There is no confirmation before exiting AR mode, risking lost progress.
- **Screenshot 2:**

  [Screenshot 2: No dialog when pressing "Exit" in AR view.]

  Figure 2 shows the absence of a confirmation dialog when exiting AR mode.

- **Recommendation:** Add a confirmation dialog that states, "Are you sure? Your tour progress will reset." with options for [Cancel] and [Exit].

Heuristic 3: Consistency and Standards

Description: Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Findings:

- **Issue:** The “Search” feature uses different icons and text labels inconsistently across the app.

  Screenshot 3:

  [Screenshot 3: Inconsistent icons and text labels for the search feature.]

  Figure 3 highlights the inconsistency in the search feature.

- **Recommendation:**Standardize the search icon and text label across the app to maintain consistency.

Heuristic 4: Error Prevention

Description: The system should prevent problems from occurring in the first place.

Findings:

- **Issue:** Users can select exhibits that are not available or have scheduling conflicts without any warning.
- **Screenshot 4:**

  [Screenshot 4: Absence of conflict alert during exhibit selection.]

  Figure 4 illustrates the lack of conflict detection when selecting exhibits.

- **Recommendation:** Implement an automatic conflict detection system that notifies users if they are selecting unavailable exhibits.

Heuristic 5: Help Users Recognize, Diagnose, and Recover from Errors

Description: Error messages should be expressed in plain language, precisely indicate the problem, and constructively suggest a solution.

Findings:

- **Issue:** Error messages are vague and do not provide clear guidance for users.
- **Screenshot 5:**

  [Screenshot 5: Generic error message displayed.]

  Figure 5 shows a vague error message that does not help users.

- **Recommendation:**Provide specific error messages that indicate the problem and suggest corrective actions.

2.Summary of Findings and Recommendations

- **Usability Issues Identified:**
  - Lack of visual feedback and loading indicators.
  - Lack of user control when exiting AR mode.
  - Inconsistent icons and labels in the search feature.
  - Absence of error prevention for exhibit selection.
  - Vague error messages that do not guide users.
- **Key Recommendations:**
  - Improve loading feedback with spinners or progress bars.
  - Implement confirmation dialogs for critical actions.
  - Standardize terminology and icons throughout the app.
  - Introduce conflict detection for exhibit selection.
  - Enhance error messages to provide clear guidance.

3.2 Key UX Issues Identified

Key UX Issues Identified in the Virtual Museum Tour App

1. Lack of Visual Feedback and Loading Indicators

- **Description**: Users do not receive any visual feedback when loading exhibits or saving artifacts. This absence of feedback can lead to confusion, as users may think their actions did not register, prompting them to double-tap or repeatedly click.
- **Impact:**This can result in a frustrating user experience and potential errors in navigation.

2. Lack of User Control When Exiting AR Mode

- **Description:** There is no confirmation dialog when users attempt to exit AR mode, which risks losing their progress in the tour. Users may accidentally exit without realizing the consequences.
- **Impact:** This can lead to user frustration and a sense of helplessness, as they may lose valuable information or progress.

3. Inconsistent Icons and Labels in the Search Feature

- **Description:**The app uses different icons and text labels for the search feature across various sections, leading to confusion about functionality. For example, a magnifying glass icon may be used in one area, while a text label is used in another.
- **Impact:**This inconsistency can hinder user understanding and navigation, making it difficult for users to locate and utilize the search feature effectively.

4. Absence of Error Prevention for Exhibit Selection

- **Description:** Users can select exhibits that are not available or have scheduling conflicts without any warning from the system. This lack of preventive measures can lead to user frustration when they realize their selections are invalid.
- **Impact:** This can result in wasted time and effort, as users may need to backtrack and reselect exhibits, disrupting their experience.

5. Vague Error Messages

- **Description:** Error messages displayed in the app are often generic and do not provide clear guidance on the issue at hand. For instance, a message like "Login

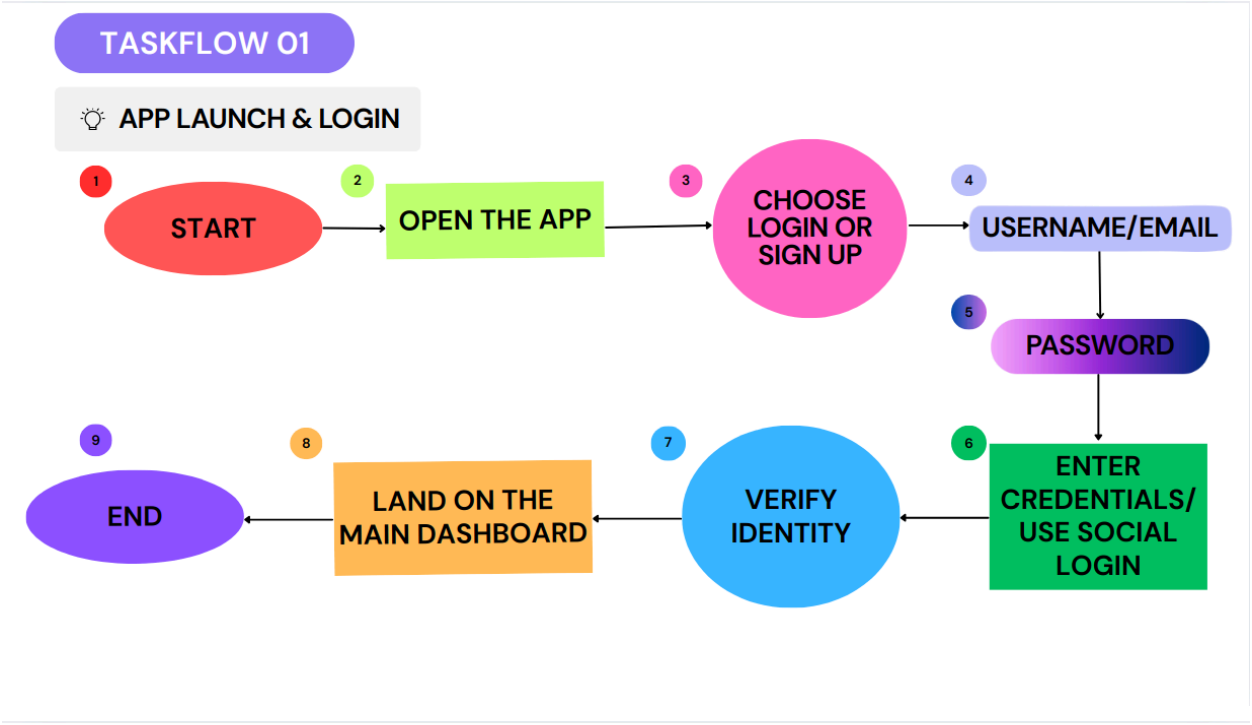
Failed" does not specify whether the problem is due to incorrect credentials or another issue.

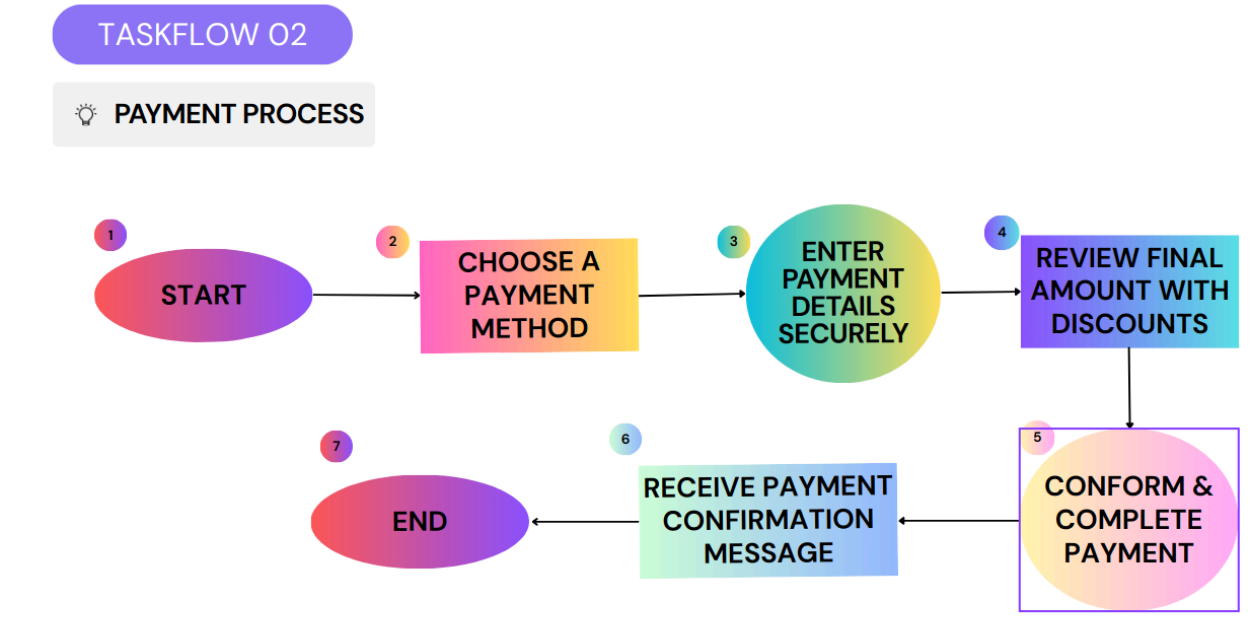
- **Impact:** This lack of clarity can leave users feeling confused and unsure of how to resolve their issues, leading to a negative user experience.

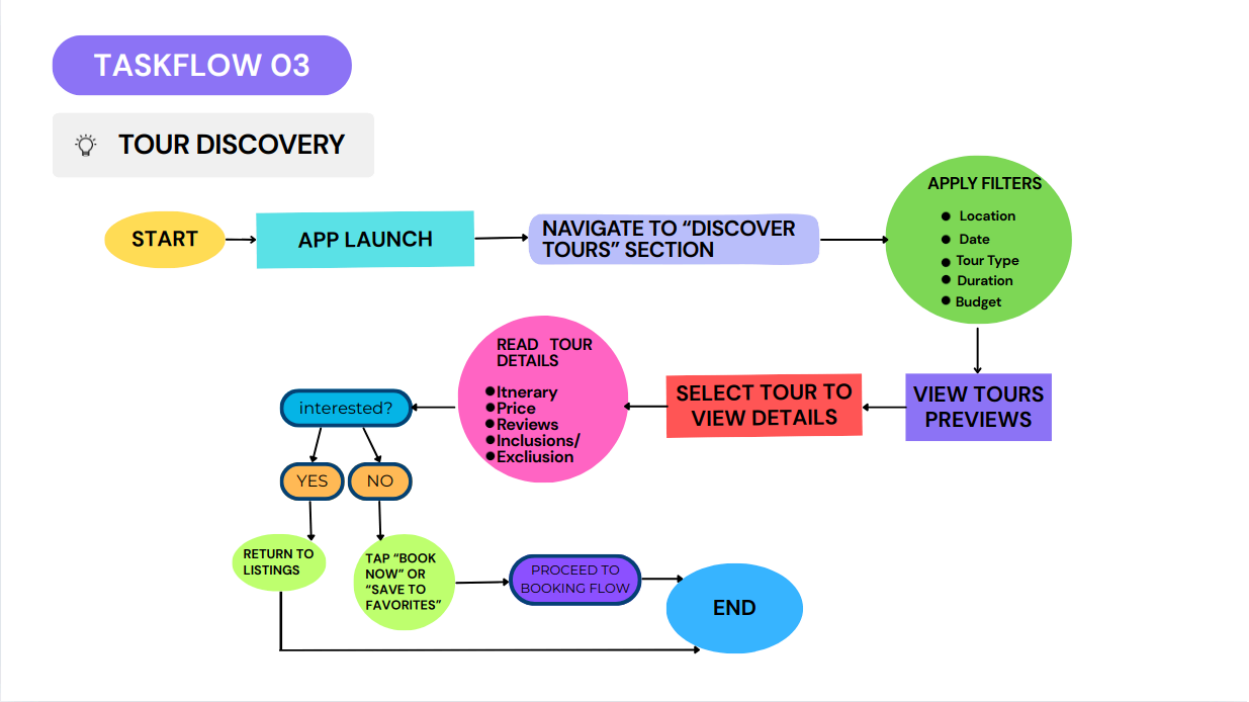
Chapter 4

Task Flows & Sitemap

4.1 Task Flows:







4.2 Sitemap:

Sitemap structure for the Virtual Museum Tour App:

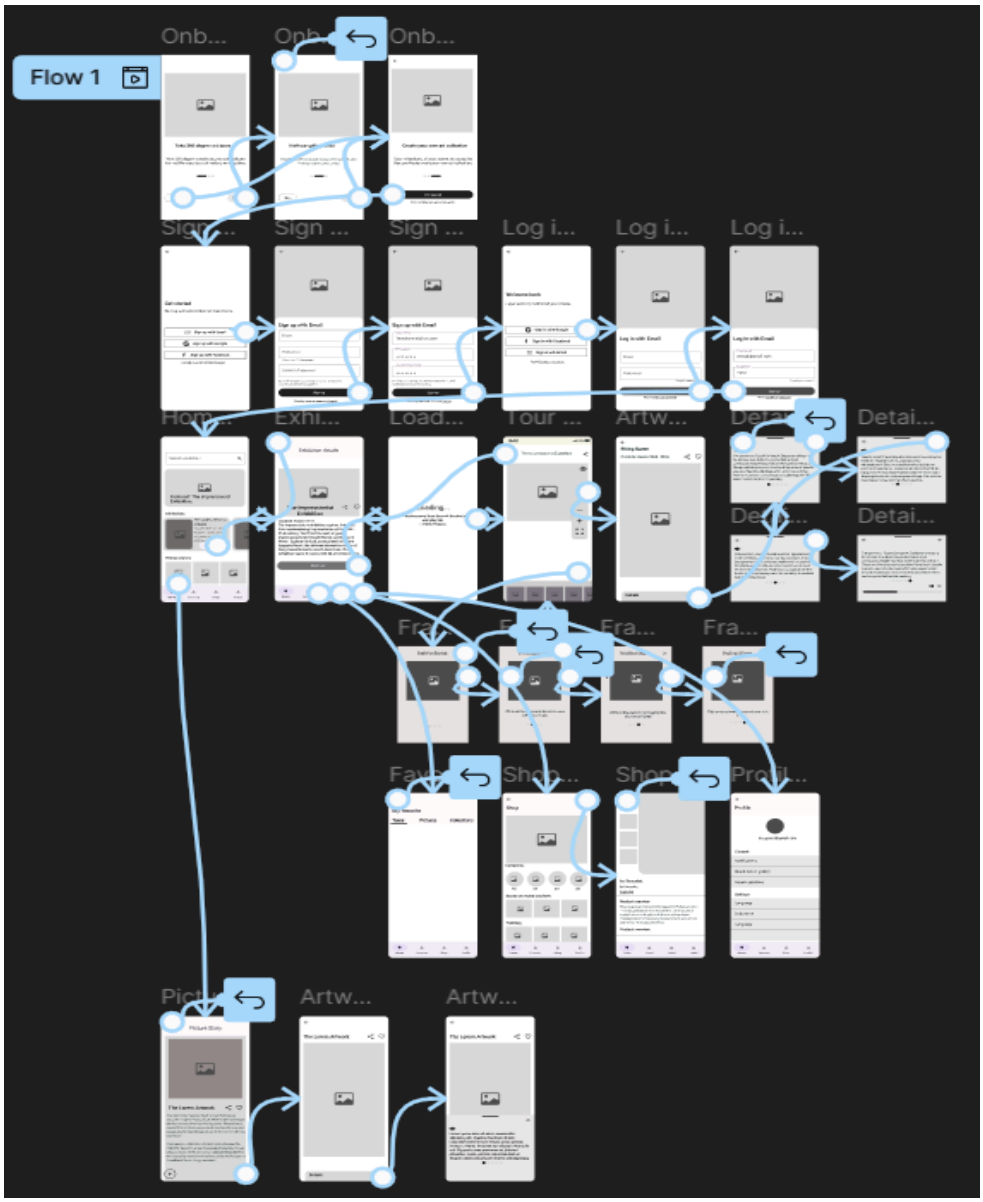
- **Dashboard:** Entry point with featured tours or exhibits.
- **Exhibits/Tours:** Browse and explore virtual museum sections.
- **AR/VR Experience:** Immersive, interactive tour interface.
- **Saved Content:** User's saved art, exhibits, or notes.
- **Search & Filters:** Find exhibits by style, era, or artist.
- **Profile:** User info, preferences, and history.
- **Settings:** Accessibility (e.g., font size, audio guide), theme, and notifications.

Chapter 5

Wireframes & Interactive Prototype (Figma)

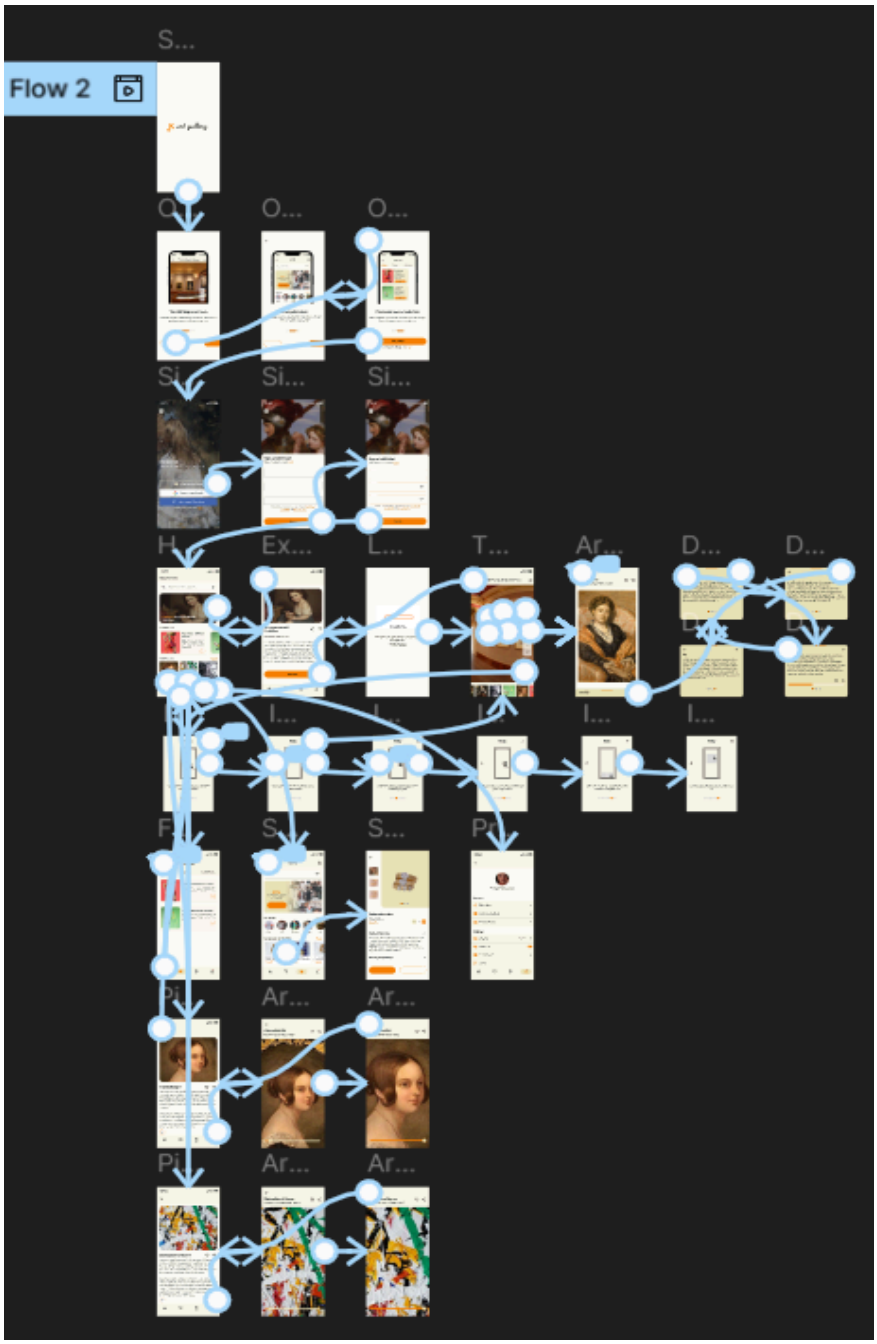
5.1 Low-Fidelity Wireframes

- Basic screen layouts for dashboard, transaction input, reports.



5.2 High-Fidelity Prototype

- Figma designs showcasing the final UI.



- **Link to the interactive prototype.:**

  https://github.com/Mrugadnik/Virtual-Museum-Tour/tree/main#virtual-museum-tour

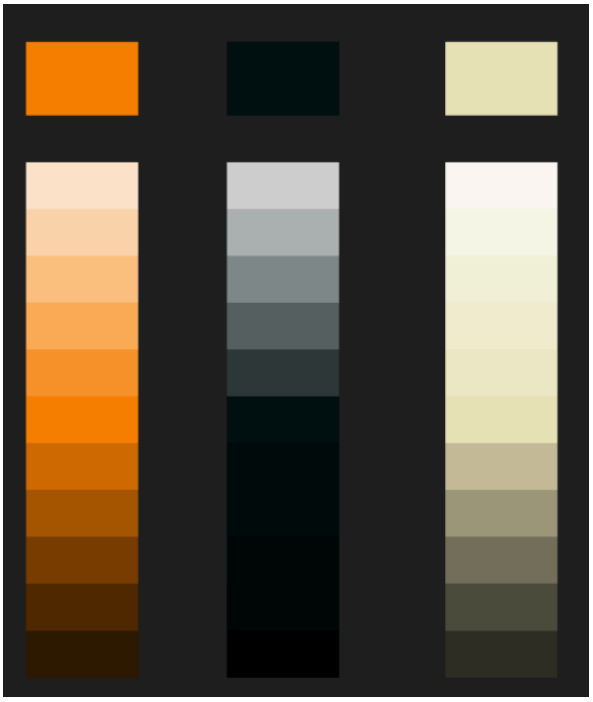
Chapter 6

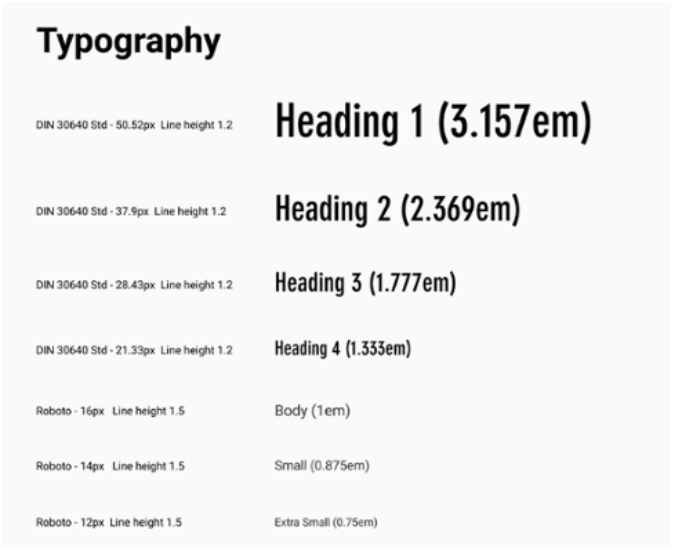
Style Guide (UI Components, Typography, Color Scheme)

Title: Developing a Style Guide: Students will create a style guide for a web application.
● Define typography, color schemes, button styles, and other UI elements.
● Create a document outlining the style guide using Figma or another design tool.
Ensure the style guide is comprehensive and easy to follow.

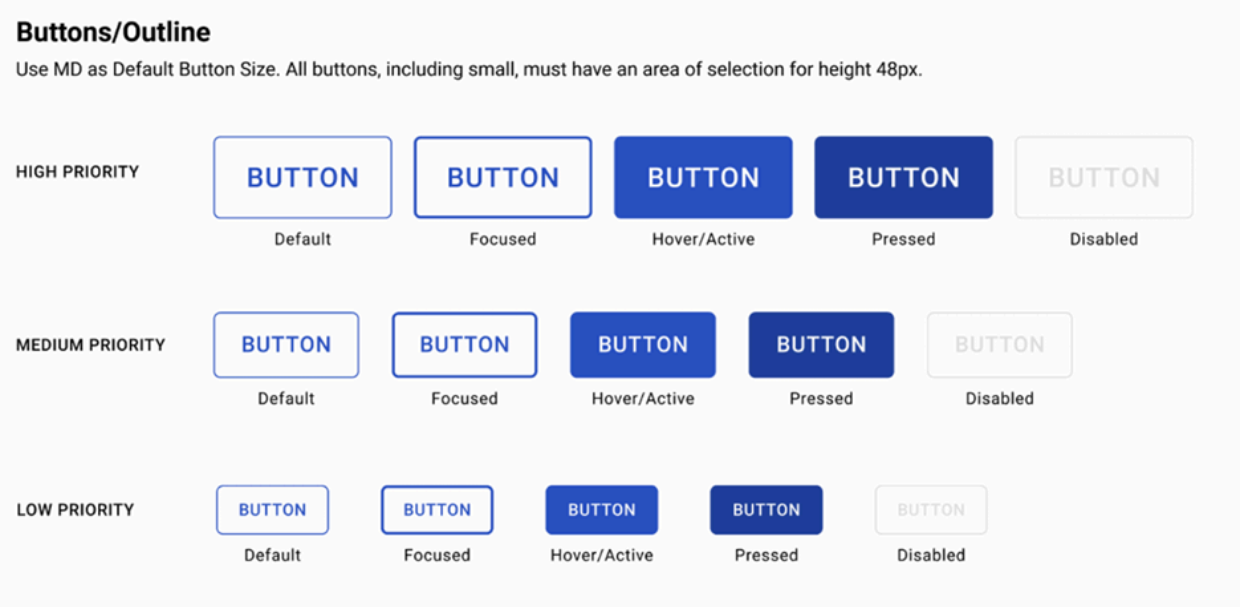
Website Name: Virtual Museum Tour App

a) Color Scheme and Typography:

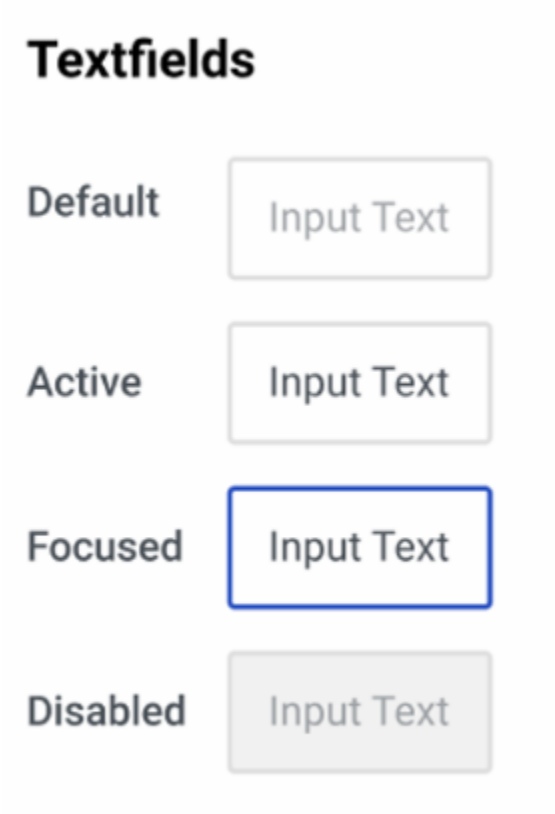




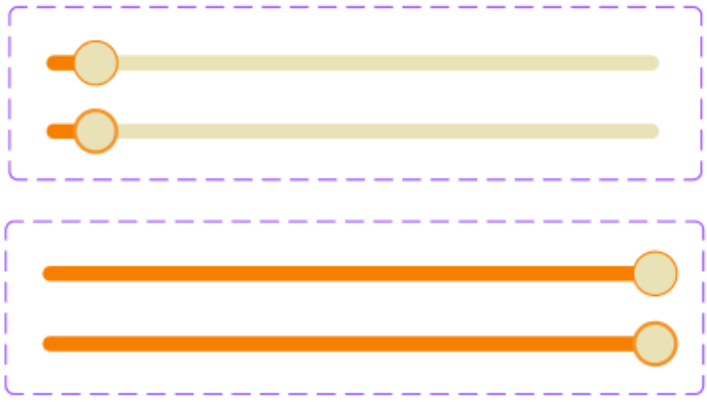
b)Button Style:



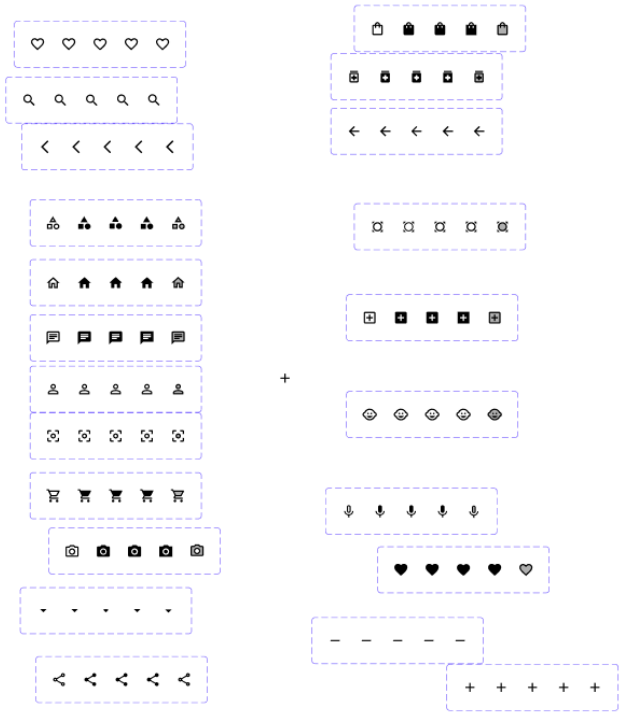
c)Text File:



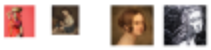
d)Interactive UI Elements (Sliders)



e)Icons:



f)Images:



Chapter 7

Findings, Designs & Improvements

7.1 Key Research Insights

Minimal Summary of UX Findings – Virtual Museum Tour App

Research Methods:

- Surveys & Interviews: Gathered user expectations.
- Competitive Analysis: Reviewed existing virtual museum platforms.

User Personas:

1. Prince Yadav (35):Seeks quick AR/VR experiences; struggles with poor performance.
2. Sakshi Kale (24): Prefers visually rich designs; finds complex navigation frustrating.
3. Sachin Shetty (67): Needs simple, educational content; prefers larger text and voice narration.

Key UX Issues:

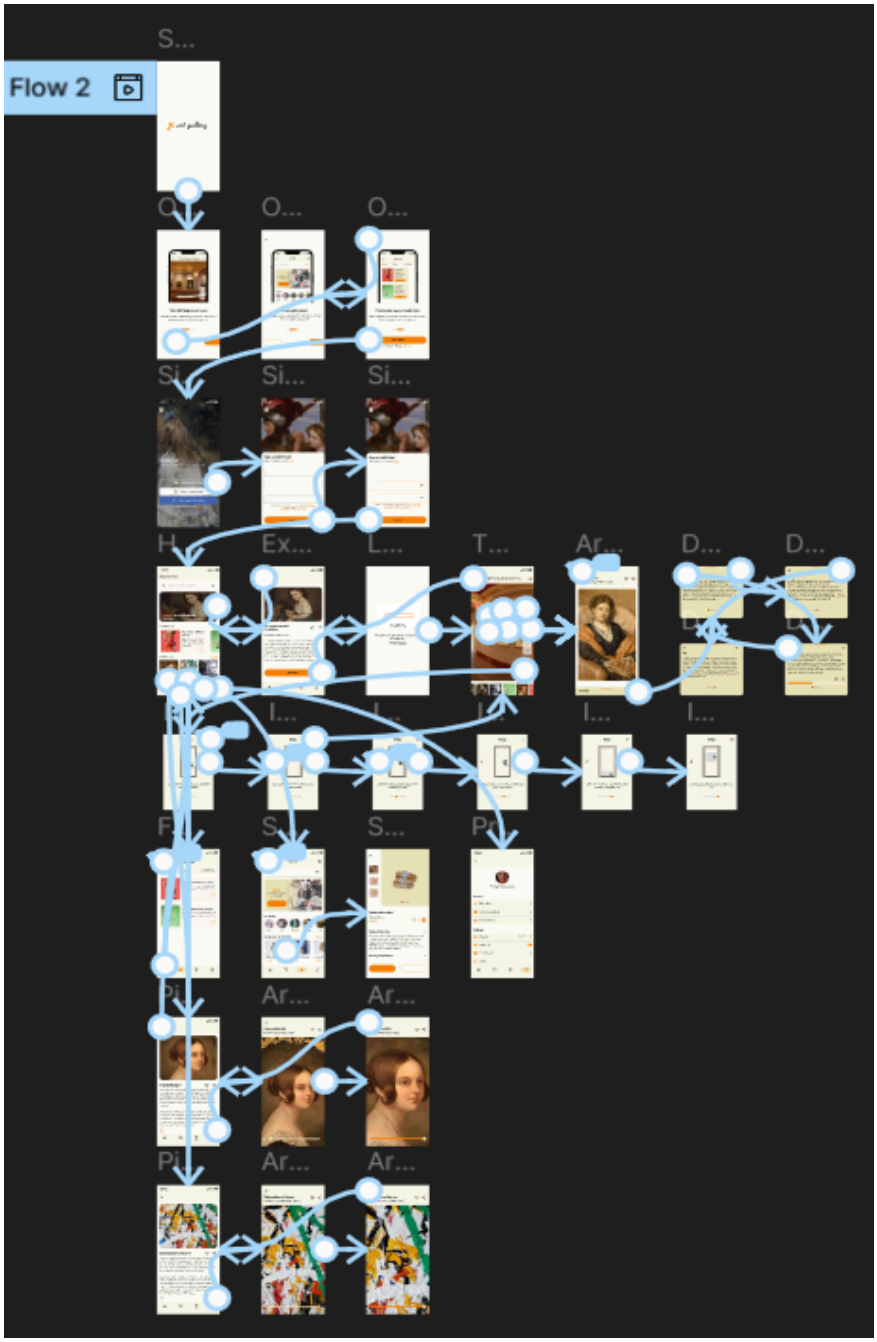
- Complex interfaces and navigation.
- Overwhelming information layout.
- Lack of accessibility features (font size, voice assist).
- Poor optimization for varying tech-savviness levels.

User Needs:

- Personalization of content.
- Enhanced accessibility features.
- Simplified navigation.
- Interactive AR/VR experiences.

7.2 Final Design Showcase

- Screenshots from the **Figma prototype**.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