PROTOTYPE REPORT

for

Majuli River Island Tour

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1 Introduction

1.1 Purpose

The purpose of this document is to give a description of prototype for the project. This project attempts to capture and virtually preserve the geography, important sites, ecology and daily life on the river island. We aim to provide a guided tour of Jangraimukh tribal village with support for interactive navigation to the user. This document also enlists the prototype evaluation using Cognitive Walkthrough and Heuristic Approach.

1.2 Document Conventions

Term	Definitions
DESC	Description
RAT	Rational
VR	Virtual Reality

1.3 Intended Audience and Project Scope

The software is meant to be used by common people who would like to have a virtual tour of the island via Google Cardboard. This software will allow the user to navigate and explore seamlessly across the virtual island.

2 Overall Description

2.1 User Flow

The user flow lays out the user's movement through our application, mapping out each and every step the user takes - from entry point right through to the final interaction. Below is the link to our user flow diagram.

Link: https://www.figma.com/file/S6nRoJAjEhep2SpTd3JEi7/UserFlow?node-id=0%3A1&t=1g1d4cQLrUicKB8L-1

2.2 Control Guide

We have created separate user manuals for each user class which contains documentation of all the controls required to use the features implemented for that user class.
Below are the images of the user guide for each user type.

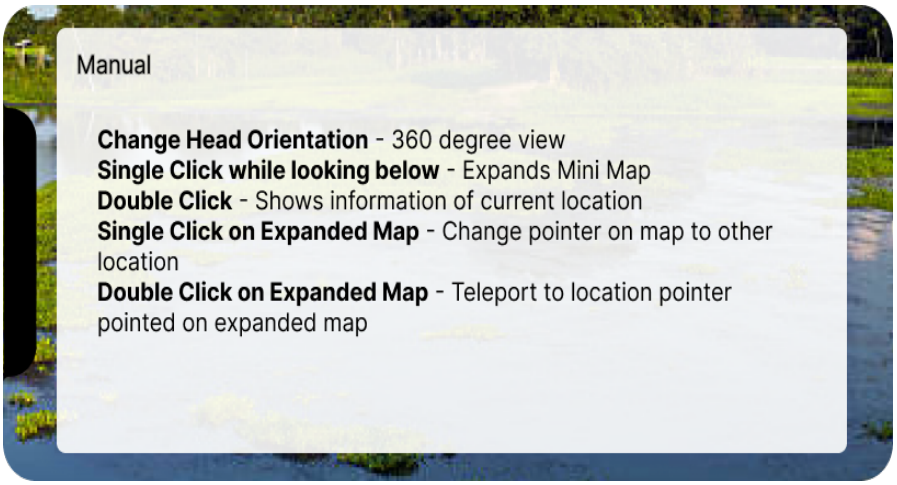

Figure 2.1: User Manual for Tourist.

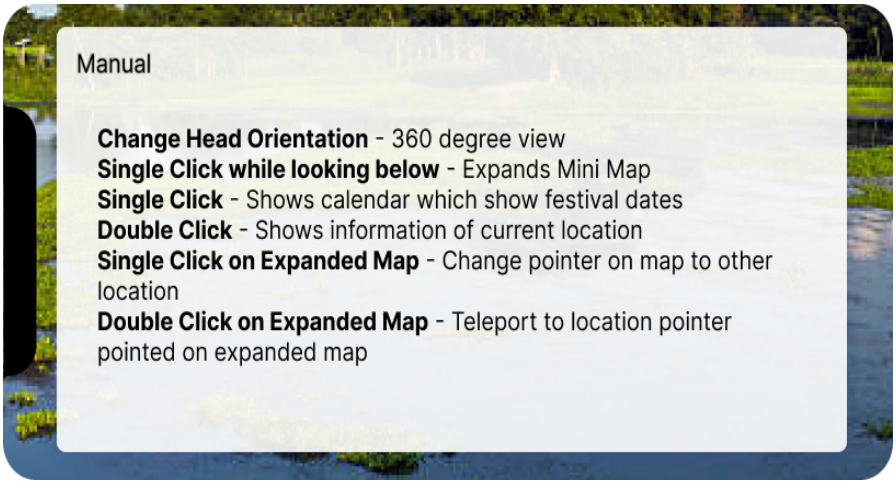

Figure 2.2: User Manual for Researcher.

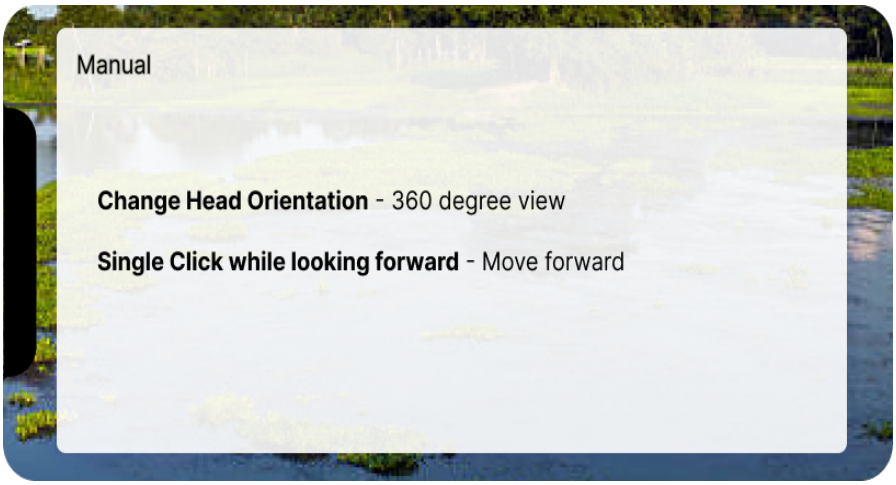

Figure 2.3: User Manual for Devotee.

2.3 Use Cases shown in Prototype

The following use cases are shown in the prototype:

1. Walkthrough of Island
2. Walkthrough of Village
3. Teleportation using main map
4. 360 degree viewing of locations

5. Display information about location
6. Event Calendar

2.4 Prototype Links

We have used several tools to make our prototype. The interface designs are created on **Figma**. **InstaVR** is used for 360 degree viewing of locations. **Murf.ai** is used to give voiceovers corresponding to the feature explanations. For video editing, we have used **iMovies**.

We have shown the interface interaction of our prototype on Figma.
Link: https://www.figma.com/proto/2v8YxEB75UVnyquPXrgHdl/APP-UI?node-id=4%3A3065&scaling=min-zoom&page-id=0%3A1&starting-point-node-id=4%3A3065

We have made our prototype as a video for each user class showing all the use cases.
Link: https://youtube.com/playlist?list=PLswwu4tHf2DfuAeTH-J8RM2esbvSBD8iF

3 Prototype Evaluation

3.1 Cognitive Walkthrough Evaluation

3.1.1 Requirements

- Evaluators: Our Target audience is any person with sufficient cognitive, physical and technological capabilities to use Google cardboard on a mobile phone. For this evaluation, we have made some students of our college having sufficient experience with VR applications as the evaluators.
- Representative tasks
  - **360 degree viewing:** We provide a 360 degree view of every location.
  - **Teleport:** The user can select a location on the main map in order to teleport to that location.
  - **Information about location:** We provide the information about the current location to the user.
  - **Event Calendar:** We provide a calendar which details different festivals celebrated in the region.

3.1.2 Task description and Questionnaire

1. 360 Degree Viewing
   - Interface-level tasks
     1. Start the app.
     2. Change the settings as per your need.
     3. Play the intro video.
     4. Move your head for 360 degree view of the initial location.
   - Questions
     1. Is the interaction required to change the settings apparent?
        Expert 1: The procedure to change the settings is very intuitive and the changes in the settings are clearly visible.
        Expert 2: The process for changing the settings is fairly simple, and the improvements are immediately noticeable.
        Expert 3: The settings page flows naturally and all the options are clear.

2. Is the initial location clearly visible?
   Expert 1: Due to the limitations of the device at hand, the quality of the visuals is not that good.
   Expert 2: The visual quality isn't very great because of the limits of the equipment at hand. Nevertheless, it is clear enough to not ruin the immersion.
   Expert 3: The quality of visuals is decent.

3. Does the view change smoothly as you move your head?
   Expert 1: Yes, there is minimal lag while adjusting the view of the surroundings.
   Expert 2: Some lag is there but it is not significant enough to ruin the experience.
   Expert 3: There is some lag while changing the view of the surroundings.

2. Teleport
   - Interface-level tasks
     1. Click the mini-map to open main map.
     2. Select the location on the main map.
     3. Close the main map to teleport to the selected location.
   - Questions
     1. Are you able to locate the mini-map easily?
        Expert 1: As described in the manual, the mini-map is found easily by looking at the ground. However, it is slightly inconvenient to click while keeping your neck down.
        Expert 2: Yes, the mini-map is easy to find by looking at the ground.
        Expert 3: It is simple to locate the mini-map by gazing at the ground, as stated in the manual. But, clicking with your neck lowered is a little uncomfortable.

     2. Is the main map easy to understand?
        Expert 1: It takes some time to get used to the cylindrical view of the main map.
        Expert 2: The main map's circular view requires some getting used to.
        Expert 3: Yes, the map's cylindrical view makes it easy to view the entire map by turning my head.

     3. Is the interaction required to select location on the main map apparent?
        Expert 1: Yes, it is quite simple since we just need to click once to change the pointer to the next location.

Expert 2: Yes, it is easy to teleport to any location by repeatedly changing the pointer location to desired location.
Expert 3: Yeah, it is fairly simple since relocating the pointer to the next place only requires a single click.

3. Information about location
    - Interface-level tasks
        1. Get to any location.
        2. Double click to open information box.
        3. Single click to close the information box.
    - Questions
        1. Are you able to open information box in the first try?
        Expert 1: Yes, the information box is opened in the first try.
        Expert 2: Yeah, on the first try, the information box is opened.
        Expert 3: Yes, the procedure to open the information box is quite straightforward.

        2. Is the text readable?
        Expert 1: The font of the text is slightly small so, it is a strain to read.
        Expert 2: The text is readable but it should be a little bigger
        Expert 3: It is difficult to read because the text's font is a little small.

        3. Is the information provided really helpful?
        Expert 1: Yes, the information is quite relevant but the vocabulary can be simplified.
        Expert 2: Yes, the text is informative.
        Expert 3: The content is certainly pertinent, but the vocabulary should be designed to be user friendly.

4. Event Calendar
    - Interface-level tasks
        1. Get to any location outside village.
        2. Single click to open calendar.
        3. Single click to close the calendar.
    - Questions
        1. Does the calendar detail local festivals?
        Expert 1: Yes, the calendar details all the popular festivals but some local festivals are not present.
        Expert 2: Yes, the calendar contains all major holidays.

Expert 3: Yes, the calendar lists all the well-known holidays, although several regional holidays are missing.

2. Is the calendar readable and easy to understand?
   Expert 1: The calendar is presented in a way similar to the main map and takes some time to get used to.
   Expert 2: The calendar is presented in an unusual manner that takes some getting used to. However, it allows us to easily view the entire calendar.
   Expert 3: Yes, the cylindrical view makes it easy to view the entire calendar.

3. Do you feel any confusion among the controls?
   Expert 1: No, there is no confusion as the steps in the control manual are easy to follow.
   Expert 2: The controls are quite straightforward.
   Expert 3: No, there is no confusion because the steps in the control manual are straightforward.

3.2 Heuristic Evaluation

3.2.1 Evaluation 1

1. Visibility of system status
   The system status is not shown for all actions, for instance, when I teleport to a new location, no feedback is given.

2. Match between system and the real world
   The controls are very intuitive and they match with the real world.

3. User control and freedom
   It is easy to undo and redo some actions like information box and event calendar.

4. Consistency and standards
   The design is not consistent. For example, at some places single click of google cardboard button opens the calendar and at others single click is used to move forward.

5. Error prevention
   When I open the main map to teleport, there is no confirmation option for the selected location before teleportation.

6. Recognition rather than recall
   The application design is quite intuitive and hence does not require much memorization of controls.

7. Flexibility and efficiency of use
   The selection of different user types in the settings page allows for a uniquely tailored experience according to the needs of the user.

8. Aesthetic and minimalist design
   Only the relevant details are shown. No irrelevant information is asked or displayed in the application.

9. Help users recognize, diagnose, and recover from errors
   No error messages are shown.

10. Help and documentation
    I can't see the control manual anytime I want. It is only shown once in the starting.

3.2.2 Evaluation 2

1. Visibility of system status
   While moving around the village, the system state is not visible.

2. Match between system and the real world
   The mini-map is visible by looking at the ground which is not consistent with the real world.

3. User control and freedom
   Functions, like information box and event calendar, have the same controls to undo and redo which makes them easy to use.

4. Consistency and standards
   The mini-map is present at an odd place.

5. Error prevention
   The pointer in main map moves only in one direction so, I need to traverse the entire map to get to the previous location.

6. Recognition rather than recall
   As the application's design is very simple, learning its controls doesn't take much effort.

7. Flexibility and efficiency of use
   It is flexible for both novice and experienced users.

8. Aesthetic and minimalist design
   Only pertinent information is displayed. The programme neither asks for nor displays irrelevant information.

9. Help users recognize, diagnose, and recover from errors
   Error handling is not done properly.

10. Help and documentation
    I have to start the app once again to see the controls which is very inconvenient.

3.2.3 Evaluation 3

1. Visibility of system status
   No feedback is provided on any action.

2. Match between system and the real world
   The map shows a pointer to the current location. Also, the calendar follows real world conventions.

3. User control and freedom
   There are no undo features for some actions like teleportation.

4. Consistency and standards
   Information box and main map have the same controls at any location.

5. Error prevention
   There is no confirmation option for the chosen place before teleportation.

6. Recognition rather than recall
   Moving around, main map and calendar all have well known icons to recognise the feature.

7. Flexibility and efficiency of use
   The settings page's option of several user classes enables a uniquely customised experience based on the user's requirements.

8. Aesthetic and minimalist design
   The design is simple and looks clean. It shows only the necessary information.

9. Help users recognize, diagnose, and recover from errors
   There is very little support for helping users recover from errors.

10. Help and documentation
    After the initial time the control manual is shown, there is no way to open it again, which causes an issue in case I forget a particular control.

3.2.4 Evaluation Summary

Heuristics	**Evaluation 1**	**Evaluation 2**	**Evaluation 3**
Visibility of system status	×	×	×
Match between system and the real world	✓	×	✓
User control and freedom	✓	✓	×
Consistency and standards	×	×	✓
Error prevention	×	×	×
Recognition rather than recall	✓	✓	✓
Flexibility and efficiency of use	✓	✓	✓
Aesthetic and minimalist design	✓	✓	✓
Help users recognize, diagnose, and recover from errors	×	×	×
Help and documentation	×	×	×

4 Feedback Analysis

The feedback received by the experts was very useful. A lot of usability issues were discovered and shall be rectified in the final product. A summary of these issues follows.

- Concerning the information displayed, the text displayed should be made more readable by increasing the font and by using simpler language.
- The events calendar can be modified to incorporate more local festivals.
- We can display the system status when a user teleports to a new location by displaying the name of the location the user has teleported to.
- We can introduce a confirmation option to verify whether a user wants to teleport to specific location.
- We can introduce some functionality to allow user to access control manual anytime they require.
- We can introduce FAQ's, common errors and how to recover from them.