SOFTWARE REQUIREMENTS SPECIFICATION

for

VR Tour Application for Jangraimukh tribal (Mishing) village

Version 1.3
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Revision History

Sno.	Date	Reason for Change	Version
1	28/1/23	Original	1.0
2	31/1/23	Remarks from TA	1.1
3	2/2/23	Remarks from TA	1.2
4	4/2/23	Final Edit	1.3

1 Introduction

1.1 Purpose

The goal of this project is to create a VR tour of Majuli River Island, in specific the Jangraimukh tribal village. The VR tour will have two major components: a beginning, giving a brief overview of the island, and then the tour itself consisting of specific sites (temples and villages) and a tour of the Jangraimukh tribal (Mishing) village. The tour is interactive and is incorporated with multimedia elements to enhance user experience that will give users a comprehensive understanding of the island's location including important places such as temples and will emphasize the daily life of people and the geographical, ecological cultural aspects as well as architectural heritage.

The purpose of this document is to provide a comprehensive description of the VR tour of Majuli Island, in specific the Jangraimukh tribal (mishing) village software product. This includes a description of the product's functionality, user requirements, and system constraints.

1.2 Document Conventions

SRS	Software Requirements Specification
VR	Virtual Reality
UI	User Interface
DESC	Description
RAT	Rational
DEP	Dependency
WT	WT
HMD	Head-mounted Displays
Ç	Cyclic

Note: A *state* usually corresponds to a True/False type of input as a user chooses a specific functionality.

1.3 Intended Audience and Reading Suggestions

The primary audience for this VR tour project is mainly tourists and travelers who want to learn more about the Majuli River Island and specifically Jangraimukh village's

cultural, ecological, and architectural legacy. The VR tour is also appropriate for students, scholars, and anybody with an interest in the region. The VR tour's interactive, multimedia-rich experience immerses the audience in the island's culture, history, and ecology - making it a unique and informative experience. Also, the application's accessibility via VR devices and platforms makes it comfortable and easy to access for a wide spectrum of end users, independent of their actual location.

1.4 Project Scope

The scope of this VR Tour of the project includes the creation of an immersive and interactive experience for users to explore the ecological, cultural, and architectural heritage of the island. The user is first taken to a start screen with a multimedia-enabled introduction to the location, geography, ecology, and daily life on the island, including images, videos, audio, and a voice-over, and then provided with the option to skip the intro and directly start the tour. Then the user is taken to the Start-Point of the Jangraimukh Tribal (Mishing) Village and an option is provided to have a WT of the space (the user may choose not to have this WT) and is then free to explore with easy and intuitive interactive navigation options. The user is guided by a MiniMap shown at the bottom corner of the screen and supported by teleportation for navigation by clicking and interacting with this map, this allows the user to explore the tour and the village's cultural diversity at their own pace and leisure.

The VR tour should run smoothly on a wide range of hardware, including desktop computers and laptop devices enabled with Oculus necessities without any lag or disruption. The tour should also be accessible to users with disabilities and compatible with a wide range of operating systems and web browsers.

In summary, the scope of the VR Tour of Majuli River Island & it's Jangraimukh Village project includes the creation of a multimedia-enabled VR tour with interactive navigation, accessible to users of different ages and technical backgrounds, and compatible with a wide range of hardware and software.

1.5 User-Flow Flowchart
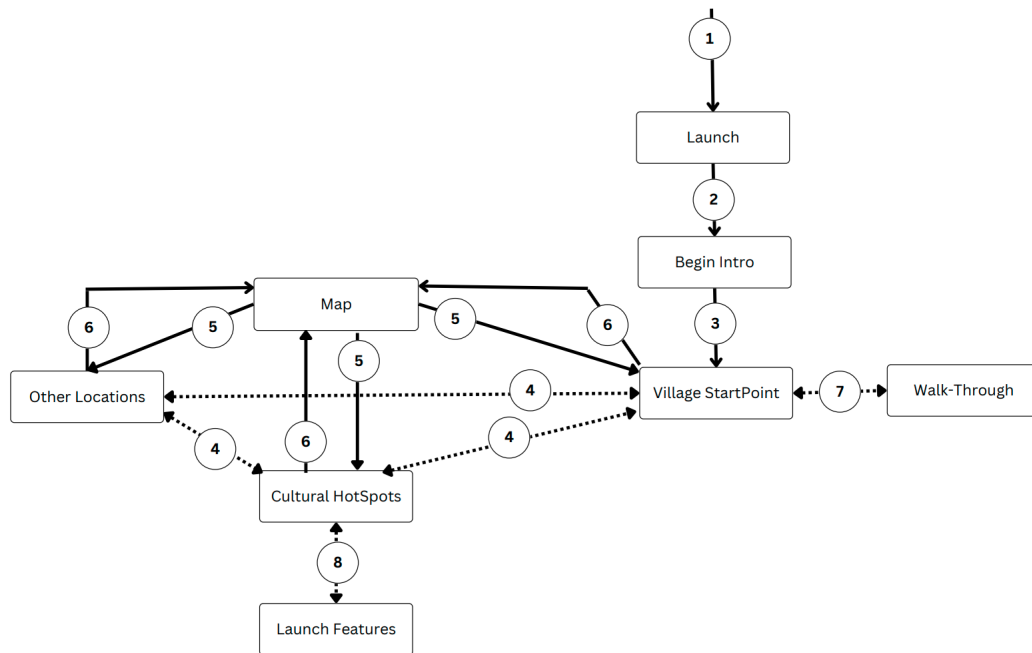
Figure 1.1: **Entire user-flow**

Giving a brief idea about the dependence of entities on each other and functional activities.

1. Primary Launch feature - user launches the application.

2. User begins the intro tour by giving a comprehensive idea of the location, important places, geography, ecology, and daily life consisting of ambient audio and voice-over.

3. Then the user enters the village Start Point.

4. $\mathcal{C}$ Navigation function allows the user to explore various parts of the village and move between various locations.

5. User can excess map from all locations including the start point, cultural hotspots, and other locations.

6. Using the map user can teleport to cultural hotspots, and other locations and can also return to the starting point.

7. $\mathcal{C}$ A WT of the village can also be accessed at the starting point showing various village activities and daily life.

8. $\mathcal{C}$ At cultural hotspots users can launch several features to know more about the culture and daily life of the village and also experience the day-to-day activities of the village.

2 Overall Description

2.1 Product Perspective

The perspective of this VR tour product could be viewed from various angles

- ***Tourism & Travel*** : A VR tour offers a novel and imaginative method for discovering a location. This type of tour is of interest to individuals who desire to visit new destinations from the comfort of their own homes.

- ***Education and Research***: This app serves as an educational device to uncover the cultural, ecological, and architectural history of Majuli river island and Jangraimukh Village. It can also be employed in academic settings and for scholarly inquiries as a VR tour.

- ***Local community***: The VR tour offers a chance to display the charm and distinctiveness of the island & the Jangraimukh village, raising recognition and admiration among a broader audience

- ***VR industry***: As a product that showcases the capabilities of VR technology, the application can be seen as a demonstration of the potential for VR to be used in other industries and applications.

- ***Environmental conservation***: As a means to increase understanding of the ecological and cultural heritage of Majuli river island and Jangraimukh Village, the VR tour could play a role in promoting efforts for safeguarding and preserving the island and its surroundings.

2.2 Product Functions

The VR tour should enable users to have the following experiences:

- ***Complete immersion***: Users should be able to fully immerse themselves in the VR environment and explore the island from all angles.

- ***Interactivity***: The VR tour should feature interactive elements, such as the ability to zoom, rotate, and move to different parts of the island.

- ***Realistic visuals & Real Elements***: The VR tour should have high-quality graphics, including realistic textures, lighting, and shadows, for an authentic experience and there should also be real-life content like real videos, geo-location content, etc.

- **Audio information**: An audio tour should be included to provide information about the island, its history, and its cultural significance.

- **Multi-language support**: The VR tour should support multiple languages to make it more accessible.

- **User movement**: The VR tour should track the user's movements and provide the option to teleport if needed.

- **User feedback analysis**: The VR tour should gather user data and feedback for analysis and further development purposes.

2.3 User Classes and Characteristics

The users are divided into three classes: Senior Citizens, Students & Researchers, and Tourists & Cultural Enthusiasts.
For **senior citizen**-targeted VR tour app:

- Simple, easy-to-use interface

- Large, high-contrast text

- Audio descriptions for visually impaired

- Limited physical demands

For **student and researcher**-targeted VR tour app:

- Detailed and accurate information

- Interactive elements for exploration and learning

- User-friendly interface with intuitive navigation.

- Markers on map.

For **tourist and cultural enthusiast**-targeted VR tour app:

- Immersive and interactive experience

- Option to explore at own pace

- Interactive map with teleportation

- Multilingual support

- Elaboration on local events and attractions

- Detailed information on cultural heritage sites and landmarks

2.4 Operating Environment

HMD necessities: The VR tour could be designed to run on a variety of hardware platforms - especially any Oculus-enabled device.

Operating Systems: The VR tour could be designed to run on popular operating systems such as Windows, macOS, and Linux.

Memory & Graphics: The VR tour may require a graphics card and a GPU-enabled system with decent processing power and memory to run smoothly.

Network Resources: The VR tour requires a stable internet connection for downloading multimedia content and synchronizing the VR experience with the user's device.

2.5 Design and Implementation Constraints

2.5.1 Design Constraints

1. It is crucial for the application to be designed to preserve the genuineness, authenticity, and precision of the cultural, ecological, and architectural heritage of the island.

2. There must be a balance between the need for interactivity and multimedia with the need to respect the privacy and dignity of the local community.

3. There must be a provision for an accessible and user-friendly experience, with clear instructions and guidance to help the user navigate the tour.

4. It should be ensured that the VR tour is visually appealing and engaging, with high-quality graphics and sound.

5. The VR tour should be accessible to a wide range of users, regardless of their physical abilities or experience with VR.

2.5.2 Implementation Constraints

1. Support must be provided for interactive navigation and teleportation, to allow the user to explore the island freely and at their own pace.

2. It is needed to integrate multimedia elements, such as images, videos, and audio, to provide a rich and engaging experience for the user while ensuring optimization for performance and stability, to ensure a smooth and seamless experience for the user.

3. Adherence to relevant technical standards and best practices for VR development and multimedia production must be ensured.

2.6 Assumption and Dependencies

- We assume the availability of a VR device, such as an Oculus HMD along with the appropriate setup installed for it.

- We assume access to a reliable and fast internet connection to download and use the VR tour application.

- Our system needs to be compatible with the end-users VR device, operating system, and hardware, especially the Oculus HMD.

- We assume sufficient space in the physical environment like the desktop that the user may use to use the VR device safely and comfortably.

- Availability of headphones or other audio equipment for the best audio experience.

- The application also requires a well-lit and spacious physical environment to ensure the user can safely and comfortably use the VR device.

- Familiarity with using VR devices and applications, including interactive navigation and teleportation.

3 External Interface Requirements

3.1 User Interfaces

The software should allow the user to get a multilingual audio-visual VR tour of Majuli River Island, mainly the Jangraimukh tribal village. Before the start of the tour, the user should get an initial introductory video giving a comprehensive idea of the location, important places, geography, ecology, and daily life on the river island. The tour should include all cultural aspects as well as important geographical & ecological locations. Interactive experience should be implemented wherever possible. The visitor should have clear guidance for location awareness and teleportation for navigation, which is provided with a MiniMap. Various other features like Help button for usage instructions, audio On/Off toggle, and zoom in/out should be there to make the interface more user-friendly. The main aim should be to let the viewer experience cultural aspects as well as major activities and daily life.

3.2 Hardware Interfaces

The desktop running the software should have high performance and space, (recommended RAM-16GB and GPU support). The HMDs should have all the necessary sensors like a gyroscope, accelerometer, proximity sensor, etc to handle all the tasks. Oculus Rift and Oculus Quest 2 serve the above purpose. If using the VR tour on the desktop, a working keyboard, mouse, and speakers/headphones are required for a better experience.

3.3 Software Interfaces

The software is primarily developed for Windows systems (7+) (we intend for later versions to support Linux). The high-quality 360-degree photos should be integrated effectively with the software for seamless rendering. The medium of transport of sensor data can be wired in the case of Oculus Rift or wireless using Wi-Fi while using Oculus Quest 2.

3.4 Communications Interfaces

The transfer rate between the desktop and the HMD should be sufficient enough to avoid lag between the movement. The software should support network connectivity to enable access to additional resources.

4 Functional Requirements

4.1 Begin Tour

ID: FR_4.1
INPUT: User-Type
OUTPUT: Video
DESC: Starts the application for the VR tour. A prompt is generated for the user to enter his/her main class i.e. a senior citizen or a student/researcher or a cultural enthusiast. Then, a token is generated and the user is prompted to choose the language in which they want the introductory video.
RAT: Non-functional requirements and user interface may differ slightly depending upon the type of user.

4.1.1 Custom Language

ID: FR_4.1.1
INPUT: Language
OUTPUT: Video in chosen language
DESC: Begin the introductory video with the voice-over in the chosen language and sets the language for the VR tour features.
RAT: Many users prefer for the introduction as well as further instructions as they interact with the VR tour to be in their native language or a language they are comfortable with.

4.1.2 Control/Settings

ID: FR_4.1.2
INPUT: Control Option
OUTPUT: Control Action
DESC: Allows the user to control various settings and have a better experience.
RAT: The user may want to control the plethora of features that are usually associated with the video. This is necessary as the user may have gone through the tour multiple times or may not want the introduction or may want it at a slower/faster pace.

4.1.2.1 Skip tour

ID: FR_4.1.2.1
INPUT: Video in Motion

OUTPUT: Location (Village Start Point)

DESC: Skips the introductory video and the user is directed to the start point of the Jangraimukh tribal (Mishing) village.

RAT: Regular application users prefer to skip the tour instead of watching it multiple times.

4.1.2.2 Pause

ID: FR_4.1.2.2
INPUT: Video in Motion
OUTPUT: Paused Video
DESC: Pauses the introductory video which is currently being played.

4.1.2.3 Play

ID: FR_4.1.2.3
INPUT: Paused Video
OUTPUT: Video in Motion
DESC: Continues the introductory video which was paused earlier.

4.1.2.4 SpeedUp

ID: FR_4.1.2.4
INPUT: Video in Motion
OUTPUT: Accelerated Video
DESC: Speeds up the currently playing introductory video.

4.1.2.5 SpeedDown

ID: FR_4.1.2.5
INPUT: Video in Motion
OUTPUT: Decelerated Video
DESC: Slows down the currently playing introductory video.

4.1.2.6 Sound On/Off

ID: FR_4.1.2.6
INPUT: Video in Motion
OUTPUT: Video with sound toggled
DESC: Toggles the sound setting for the introductory video (including voice-over).

4.2 Show map

INPUT: Map token
OUTPUT: Enlarged map

DESC: The map is enlarged and shows up in a bigger view to allow the user to have an idea of their present location (which may be shown by a cursor or a pointer) and allow ease of navigation.

RAT: The user may want to know where they are, view cultural hot spots (marked with specific icons), and obtain a brief overview of their surroundings and the village landscape/territory.

4.2.1 Teleport

ID: FR_4.2.1
INPUT: Location on the map
OUTPUT: Confirm location option
DESC: Facilitates teleport functionality and prompts the user to confirm this teleport to avoid false positives.
RAT: A teleport functionality allows easier navigation as the user may want to quickly jump to specific locations.

4.2.1.1 Confirm Teleport Location

ID: FR_4.2.1.1
INPUT: Confirmation State
OUTPUT: Location
DESC: If the user confirms a teleport, they are taken directly to the location they chose.
RAT: The user may accidentally select a location so this confirmation prevents such a case from happening.

4.2.2 HotSpot Jump/Teleport

ID: FR_4.2.2
INPUT: HotSpot Location
OUTPUT: Confirm Location Option
DESC: Facilitates the user to quickly jump to a Hot Spot.
RAT: A user may want to quickly access certain events/activities and interact with the cultural elements & daily life activities incorporated in the application.

4.2.2.1 Confirm HotSpot Jump/Teleport location

ID: FR_4.2.2.1
INPUT: Confirmation State
OUTPUT: Location
DESC: If the user confirms a teleport, they are taken directly to the specific Hot Spot.
RAT: The user may accidentally select a Hot Spot so this confirmation prevents such a case from happening.

4.2.3 Zoom In

ID: FR_4.2.3
INPUT: Coordinates on Map
OUTPUT: Zoomed-In Map
DESC: Gives the enlarged view of the zoomed-in location on the map.

4.2.4 Zoom Out

ID: FR_4.2.4
INPUT: Zoomed-In Map
OUTPUT: Default Map
DESC: Gives the default view of the map.

4.2.5 Scroll

ID: FR_4.2.5
INPUT: Enlarged Map
OUTPUT: Shifted Map
DESC: Allows multi-directional scrolling for the digital map.
RAT: Specifically useful after zooming in.

4.2.6 Exit Map

ID: FR_4.2.6
INPUT: Map State
OUTPUT: Location
DESC: The user is redirected to the view of the current location as shown on the map.

4.3 Settings/Help

ID: FR_4.3
INPUT: Help State
OUTPUT: Help Menu
DESC: Allows the user to access various help settings.
RAT: The user may want to control the plethora of features associated with the tour, this can include toggling the sound as per one's choice and having a tutorial on how to use the tour.

4.3.1 Tutorial

ID: FR_4.3.1
INPUT: Tutorial State
OUTPUT: Tutorial
DESC: The user gets a tutorial on the various features of the VR tour, including the

facilities provided like cultural & daily-life interaction features, navigation techniques, gameplay features, etc.

RAT: A novice user or a senior citizen may require a tutorial to understand how to use the VR tour application.

4.3.2 Change Custom Language

ID: FR_4.3.2
INPUT: Language
OUTPUT: VR Tour in the chosen language
DESC: This allows the user to set the language for the VR tour and its features.

4.3.3 Ambient Sound On/Off

ID: FR_4.3.3
INPUT: Sound State
OUTPUT: Tour with toggled ambient sound
DESC: Allows the user to turn the ambient sound on/off.
RAT: A user with some disturbance or malfunctioning speakers/audio setup may wish to turn the ambient sound off while a user who wants to immerse themselves deeper in the VR tour may want to turn it on.

4.4 Navigate

ID: FR_4.4
INPUT: Navigation type
OUTPUT: Required movement
DESC: The user can freely and smoothly navigate through the VR tour.

4.4.1 Locomotion

ID: FR_4.4.1
INPUT: Direction
OUTPUT: Coordinates
DESC: The user moves a step towards the intended direction.

4.4.2 View Shift

ID: FR_4.4.2
INPUT: Angle of View
OUTPUT: Shifted view
DESC: The angle of view(The angle of view can be measured on three planes: the horizontal angle of view, the vertical, or the diagonal.) is taken in by the HMD and the shifted view is rendered.

Note: Usually this is in-built in an HMD like Oculus Rift/Quest for which this application is primarily developed.

4.5 Hotspot Activation

ID: FR_4.5
INPUT: HotSpot Feature
OUTPUT: HotSpot Feature Action
DESC: Allows the user to choose any particular HotSpot feature at the HotSpot location such as the information display feature or the video feature or the gameplay feature which allows interaction with the cultural aspects and daily life of the villagers.
RAT: Users tend to be inclined towards exploring the cultural and architectural heritage, the geography, ecology, and nature of the destination they want to visit. Interactive features with these aspects allow a smoother and more intuitive experience.

4.5.1 Info Display

ID: FR_4.5.1
INPUT: Entity ID
OUTPUT: Information
DESC: Displays information regarding the corresponding entity next to it.
RAT: The user may want to view more information about a particular ecological or geographical or architectural feature of the island. This is especially important for researchers and students who want in-depth information on the chosen entity (like a particular type of flower/animal/soil, a monument, a manuscript, or a scripture on a building, etc.)

4.5.2 Video/Geo-Location Content Display

ID: FR_4.5.2
INPUT: Video/Geo-Location Content ID
OUTPUT: Video/Geo-Location Content
DESC: Displays a brief video/other real-life content regarding the cultural aspects, and architectural/geological features of the location from where the option was accessed.
RAT: The user may want to have a more realistic view of the particular feature they choose. This is especially important for cultural enthusiasts and senior citizen's who may want a laid-back view of daily life & cultures like folk dance or the festivals and celebrations in the village.

4.5.3 GamePlay

ID: FR_4.5.3
INPUT: MiniGame ID
OUTPUT: MiniGame Session Token

DESC: Allows the user to experience the day-to-day activities of the village

RAT: The user may want to experience daily activities like fishing, boating, etc. in an interactive gameplay manner with a specific goal. Thus allowing the user to know more about the culture & daily life and experience them in a real-time view. This provides a comprehensive learning and enjoyable experience. This can be an attractive feature for children as well as tourists and cultural enthusiasts who may want to get a first-hand experience of the activities and daily-life of the mishing villagers.

4.5.3.1 Objective/Task

ID: FR_4.5.3.1
INPUT: MiniGame Session Token
OUTPUT: Task Indication
DESC: Tasks or Objectives are shown on the side and marked as completed once achieved.
RAT: The user needs to know what the game requires as this gives a perspective of what the daily activity or game is trying to achieve and defines the purpose of the activity that is performed in the village.

4.5.3.3 Interact With Object

ID: FR_4.5.3.3
INPUT: Object ID
OUTPUT: Object ID
DESC: Modifies the attributes of the object like color, shape, texture, position, orientation, etc.

4.5.4 Interaction with local people

ID: FR_4.5.4
INPUT: Character ID
OUTPUT: Dialog
DESC: The user may interact in a limited sense with some avatars (like the local villagers) that are present in the application, giving a more interactive experience.

4.6 Show Calendar

ID: FR_4.6
INPUT: Calendar State
OUTPUT: Calendar
DESC: Allows the user to get information about the dates of all the important festivals and events of the Jangraimukh tribal village.
RAT: Some users may wish to visit the village during a particular festival and have a

more holistic experience of the culture if they really develops a liking towards it through the VR tour.

4.6.1 Important Dates Information

ID: FR_4.6.1
INPUT: Festival Dates
OUTPUT: Information
DESC: Displays information regarding a particular festival or event.
RAT: The user may want to view more information about a particular event or festival on the island. Especially cultural enthusiasts are more inclined to know about the festival and get a piece of in-depth information regarding the same.

4.6.2 Exit Calendar

ID: FR_4.6.2
INPUT: Calendar State
OUTPUT: Location
DESC: The user is redirected back to the location from where he accessed the calendar.

4.7 Walk-Through(WT)

ID: FR_4.7
INPUT: WT State
OUTPUT: WT in Chosen language
DESC: Starts the WT video for the VR tour.
RAT: The user may want to know what he can explore and have a guided tour of the place. The WT feature enables the user to experience the aspects of the village in a guided, fixed, and brief manner.

4.7.1 Control / Settings

ID: FR_4.7.1
INPUT: Control Option
OUTPUT: Control Action
DESC: Allows the user to control various settings and have a better experience.
RAT: The user may want to control the plethora of features that are usually associated with a WT video. This is necessary as the user may have gone through the tour multiple times or may not want the introduction or may want it at a slower/faster pace.

4.7.1.1 Skip WT

ID: FR_4.7.1.1
INPUT: WT Video in Motion

OUTPUT: Location (Village Start Point)

DESC: Skips the WT video and the user is redirected back to the start point of the Jangraimukh tribal village.

RAT: The user may want to skip the WT when they feel they have sufficient idea of the tour to explore it on their own.

4.7.1.2 Play

ID: FR_4.7.1.2

INPUT: Paused WT Video

OUTPUT: WT Video in Motion

DESC: Continues the WT video which was paused earlier.

4.7.1.3 Pause

ID: FR_4.7.1.3

INPUT: WT Video in Motion

OUTPUT: Paused WT Video

DESC: Pauses the WT video which is currently being played.

4.7.1.4 Sound On/Off

ID: FR_4.7.1.4

INPUT: WT Video in Motion

OUTPUT: WT Video with sound toggled.

DESC: Toggles the sound setting for the WT video (including ambient sound).

4.8 Exit Application

ID: FR_4.8

INPUT: Exit state

OUTPUT: Exit Status

DESC: Allows the user to safely terminate the application safely and properly.

4.8.1 Take Feedback

ID: FR_4.8.1

INPUT: User feedback

OUTPUT: Thank-You Message

DESC: The user gives feedback on his VR experience of Jangraimukh tribal village and a thank you message is displayed.

RAT: Users, especially developers can give feedback which helps in improving the application.

4.8.2 Skip Feedback

ID: FR_4.8.2
INPUT: Skip feedback state
OUTPUT: Thank-You Message
DESC: Skips the feedback section and the user is directed toward the exit and a thank you message is displayed.
RAT: Regular application users prefer to skip giving feedback multiple times.

5 Nonfunctional Requirements

5.1 Usability Requirements

5.1.1 General

- The application should be user-friendly, intuitive, multilingual, and easy to navigate for users of all ages and backgrounds.

- The application's menus and toolbars should be easy to navigate for someone lacking experience using desktop applications. The VR interface should be easy to use and understand for someone with no experience using VR headsets or video game-like displays.

- A variety of VR hardware, including mobile devices and VR headsets, should be supported by the application.

- After using the application the user should have in-depth knowledge of the Jangraimukh Village of Majuli river Island.

5.1.2 For senior citizens

For senior citizens, the usability requirements for the VR tour of the Majuli river island may differ slightly from those for other audiences.

- The application should be designed with accessibility in mind, with support for larger text and high-contrast color schemes along with large, easy-to-see buttons and icons that can be easily selected to make the text more easily readable for users with visual impairments.

- The application should also provide clear audio cues, such as spoken instructions and confirmation sounds, to help users understand what is happening on the screen.

- The VR tour should showcase information and multimedia content in a leisurely and comprehensible way, enabling users to comprehend the information at their own speed, which should be reinforced by user feedback offering prompt and clear feedback through visual and audio signals to confirm successful actions.

5.1.3 For students & researchers

- The VR tour should provide in-depth information about the ecological, cultural, and architectural heritage of the village, including relevant data and historical context.

- The Cultural Hotspot feature in the application can provide access in the form of links to a range of research resources, including academic papers, books, and articles, to help users deepen their understanding of the topics covered in the tour.

- The VR tour should provide a visual aid for information like graphs, charts, etc. to help users better understand & interpret the information presented in the tour.

5.1.4 For Tourists & Cultural Enthusiasts

- The VR tour should provide a deeply immersive cultural experience, allowing users to feel like they are actually on the river island and experiencing the culture first-hand, this can be incorporated by allowing better interaction and direct access to interactive cultural activities like fishing, cooking, etc.

- We can include a calendar of cultural events, such as festivals and ceremonies so that users can plan their visit around these events.

5.2 Performance Requirements

- The program should load efficiently, navigate quickly and smoothly, and offer the user a seamless experience without lag or delays.

- The player and VR character's movements should be fluid in the simulation.

- Strong error handling and recovery methods should be in place, and the application should be reliable and have minimum downtime.

- Places already visited get automatically marked on the MiniMap for user convenience.

5.3 Software Quality Attributes

- To make it easier to develop and integrate new features and make improvements, the code should be modular and well-written.

- Routine evaluations of code and constructive criticism from the development team can assist in spotting and fixing potential problems before they escalate.

- Incorporating mechanisms for detecting and handling errors and exceptions can help in catching and fixing code issues, as well as delivering informative error messages to the user.

- Detailed documentation of the code & design can help to understand the code better and to make changes and additions more easily.

- The system should be robust enough not to fail during its usage.

5.4 Other Requirements

Our application has the potential to be a long-process software and hence may need regular maintenance as it may involve refactoring and changing requirements.

6 Appendix

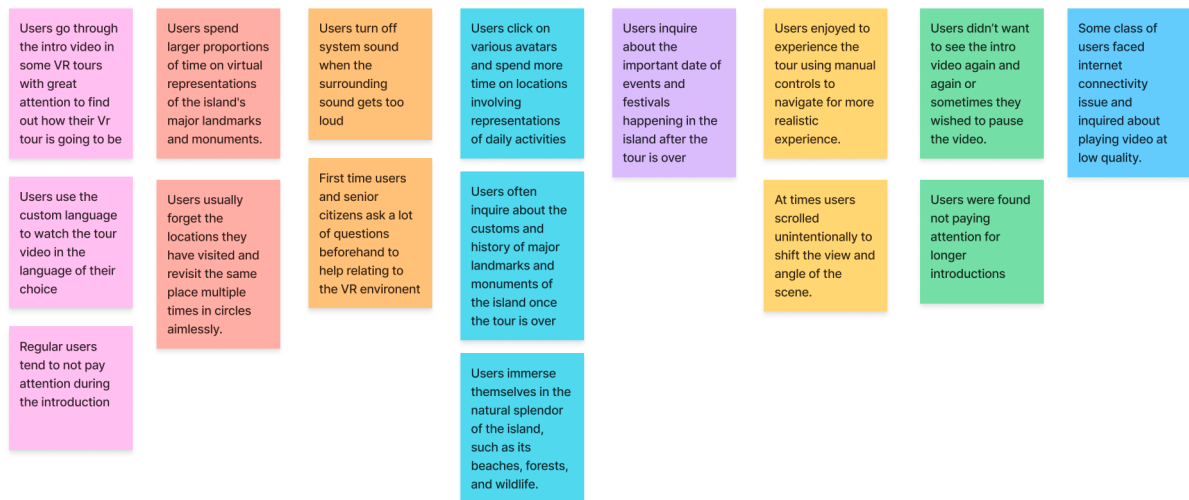## 6.1 Figures explaining work-flow
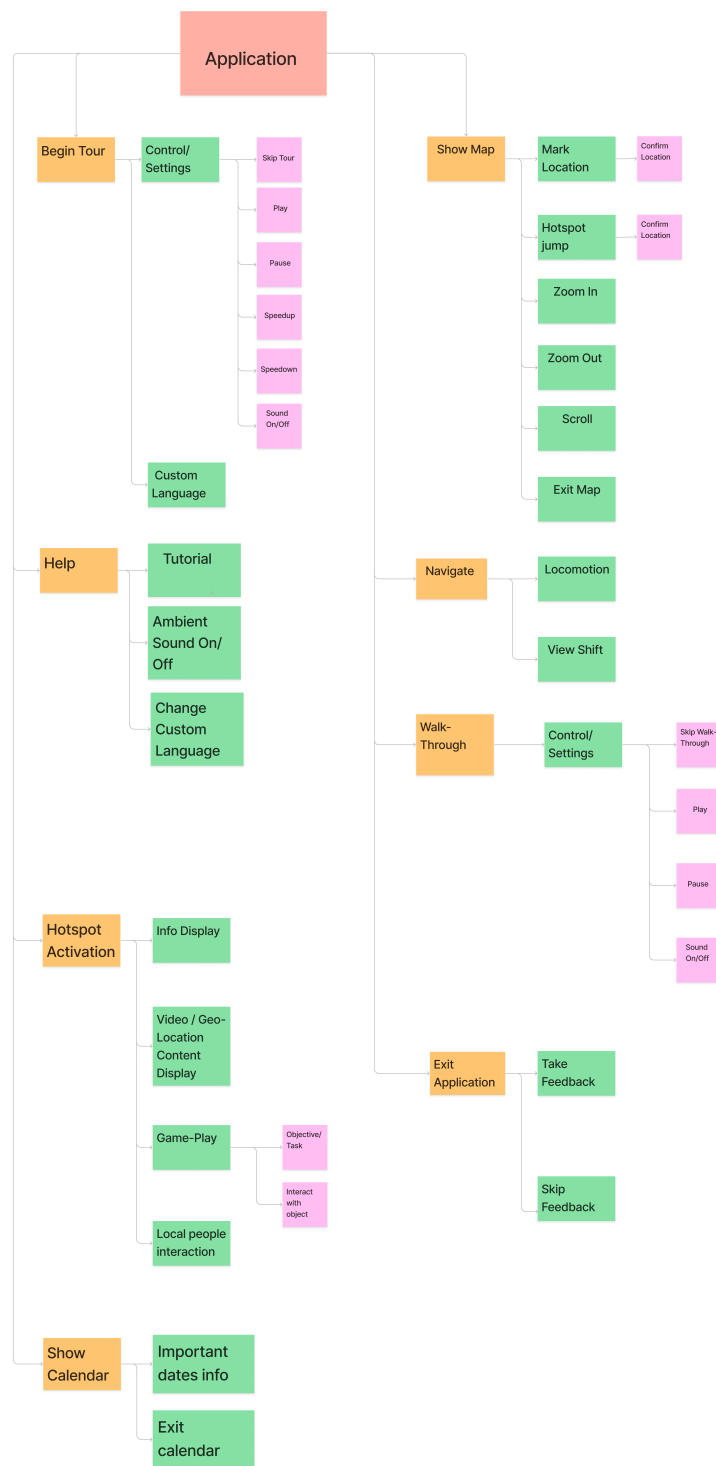
6.1.1 Contextual-Inquiry

Figure 6.1: **Affinity diagram**

6.1.2 Functional Hierarchy

Figure 6.2: **Idea for hierarchy**