Expert Evaluation

Cognitive walkthrough

Task 1: You want to move to a terrain. For that purpose, you have to use the teleportation feature of the virtual tour.

Interface level task
- Select the mini-map
- Locate a terrain in the mini-map
- Click the location on mini-map

Questions

Q1 Were you able to locate the mini-map easily?
Expert 1: Yes, it was clearly visible on the left-hand side.
Expert 2: Yes, the mini-map was large enough to be clearly visible.
Expert 3: Yes, it was standing out as it was surrounded by a white border.

Q2 Were you able to locate a terrain easily in the mini-map and did you choose the incorrect location?
Expert 1: Yes, the map was large enough for me to locate a terrain. I did not choose an incorrect location.
Expert 2: Yes, I could easily identify the terrain in the map as it was marked by brown colour. No, I chose the correct location in the first go.
Expert 3: Yes, I had no difficulty in locating the terrain. No, I didn't choose an incorrect location.

Q3 Did you find the instruction manual useful for teleportation?
Expert 1: Yes, the instruction manual prompted in the beginning had the information regarding teleportation.
Expert 2: Yes, the instruction manual clearly specified the steps to teleport to a location.
Expert 3: Yes, the instructions about teleportation in the manual was clear and precise.

Q4 Was the effect of teleportation same as what you expected?

Expert 1: Yes, I was teleported to the exact location.

Expert 2: No, I think I was teleported a location which was slightly off to what I expected. The reason behind this could be that the map was rotated as I moved to the new location.

Expert 3: Yes, I am satisfied with the location to which I was teleported.

Task 2: You have to find some flora that is distinguishable from the other plants in that region and you have to examine and collect some notes about that plant.

Interface level task

- Locate the plant that is distinguishable from the other plants in that area.
- Zoom-in on that plant to examine it closely.
- Click on the plant to obtain some information about it.
- Find the notes section and take some notes about the plant.

Questions

Q1 Were you able to zoom-in and zoom-out to examine the plant?

Expert 1: Yes, I was able to zoom-in to examine the plant.

Expert 2: Yes, I was able to zoom-in on the specific parts of the plant I wanted to examine.

Expert 3: Yes, I was able to zoom-in.

Q2 Did you find difficulty in locating the notes?

Expert 1: Yes, as no interface or button was visible to take notes until I pressed the tab key.

Expert 2: No, as it was specified in the instruction manual.

Expert 3: No, as it was specified in the instruction manual.

Q3 Was it apparent that you could zoom-in and zoom-out for examination?

Expert 1: No, as it was not specified in the instruction manual.

Expert 2: Yes, as I could use the scroll-wheel to zoom-in and zoom-out.

Expert 3: Yes, as the zoom-in and zoom-out mechanism was similar to many other apps I have used.

Q4 Did you make an error while editing and saving the notes? If yes, was the mechanism to correct it convenient?

Expert 1: No, I did not make an error.

Expert 2: Yes, I made an error but the mechanism to correct it was convenient as I could just correct the mistakes easily.

Expert 3: No, I did not make any mistakes so I did not have to use the correction mechanism.

Task 3: You have to view the feedback given by the tourists to analyze it and edit some descriptions based on the feedback received.

Interface level task

- Locate the object or place whose feedback you want to see on the mini-map.
- Locate the description box of that particular place.
- Edit the description as per your choice.

Questions

Q1 Were you able to locate the mini-map easily?

Expert 1: Yes, it was clearly visible on the left-hand side.

Expert 2: Yes, the mini-map was large enough to be clearly visible.

Expert 3: Yes, it was standing out as it was surrounded by a white border.

Q2 Were you able to locate the place whose description you want to change?

Expert 1: Yes, the map was large enough for me to locate the place whose description I wanted to change.

Expert 2: Yes, I could easily identify the place on the map because its geographical features were clearly demonstrated in the mini-map.

Expert 3: Yes, I had no difficulty in locating the place.

Q3 Was description box apparent?

Expert 1: Yes, I could see the description by just hovering on the location on the mini-map.

Expert 2: Yes, I could see the description as soon as I moved my cursor over that location.

Expert 3: Yes, it was apparent as it came on top of mini-map.

Q4 Did you find difficulty in changing the description?

Expert 1: No, I didn't find any difficulty in changing the description.

Expert 2: No, I could just select the description box and edit as per my wish.

Expert 3: No, the interface for changing the description was quite straight forward.

Task 4: You have to visit a place in the virtual world where some multimedia (e.g., video) is embedded. Once you are done with the multimedia, you have to give feedback about that place and mark the location as visited.

Interface level task

- Locate the place in the virtual world.
- Play the multimedia.
- Give feedback about the location in the mini-map.
- Mark that location as visited in the mini-map.

Questions

Q1 Were you able to find out whether the location was marked or not?

Expert 1: Yes, the colour of the location changed on the mini-map.

Expert 2: Yes, the marker of the location changed from red to green after getting marked.

Expert 3: Yes, it was quite notable due to the colour change.

Q2 Was the multimedia blending with the background?

Expert 1: Yes, multimedia seemed well blended with the background.
Expert 2: No, I could easily distinguish the background from the videos.
Expert 3: No, it was quite noticeable and contrasted its background.

Q3 Were you comfortable with the interface provided for feedback?
Expert 1: Yes, it was quite easy to understand the interface.
Expert 2: Yes, I was comfortable with the feedback interface.
Expert 3: Yes, the feedback interface was quite straight forward.

General Questions

1. Was there any component in the interface which you could not understand?
Expert 1: Initially I was not able to locate where I had to take the notes. Along with that I was not able to figure out how to zoom-in and out at the first place as it was not specified in the instruction manual, but after using the app for some time I got used to the features.
Expert 2: Most of the things were fairly easy to grasp other than when the map rotated during teleportation. Also, the video was not matching with its background.
Expert 3: No, I was able to understand all the components of interface as they were very clear.

2. Were there sufficient indicators so that you could identify that the actions were performed?
Expert 1: Yes, indicators were given wherever required. Whenever I moved, the mini-map was updated showing updated location, feedback and marked locations.
Expert 2: Yes, the indicators were provided that were used to show us the updated interface after the actions were performed. After setting the theme we could see the new theme in background.
Expert 3: Yes, indicators were provided after actions like marking, visiting all locations and I was also able to see updates in the application after completing the actions.

3. Was the interface in accordance with real world applications?

Expert 1: Yes, the interface is in accordance with real world conventions other than the fact that the instruction manual lacks some important instructions like how to zoom-in and zoom-out. Everything else was very similar to other applications and the real world.

Expert 2: Yes, the interface was in accordance to real world conventions. The icons like cross symbol used to close the instruction manual were in accordance to other applications.

Expert 3: Yes, the interface is in accordance with the conventions of other application in similar frame like using the scroller for zooming in and zooming out.

4. Was the design appropriate for a virtual tour?

Expert 1: Overall the design is appropriate for a virtual tour application. The mini-map gives us the feeling of a guide throughout the tour.

Expert 2: Yes, the design follows a normal virtual tour application. The rating of different places is similar to talking to the local people about the places we should visit in the tour.

Expert 3: Yes, the design is appropriate as it allows the users to move from a location to another without wasting much time through teleportation.

Result and Analysis

- Each evaluator was able to perform the tasks smoothly and achieve the required objective. They were all satisfied with the overall experience.
- Whenever the user performed some action, the app went through visible changes. The indicators were provided by the app to the user whenever they marked the location, teleported etc.
- The interface is similar to other virtual tour applications. At some point the steps to achieve the desired functionality were not apparent like the zoom-in feature, but the evaluators experience with other similar applications guided them.
- When the evaluator made some error like deleting the description of some place mistakenly, they had to write the whole description

again. It would be better if we could show a confirmation prompt before saving a description.

Analysis for functionality

1. Navigating between different places
   1.1 The user can teleport to a particular location if they follow the steps mentioned in the instruction manual
   1.2 User might feel that they are teleported to the wrong place because of rotation of map.

2. Examining an object
   2.1 The process to zoom-in and zoom-out is quite intuitive for a user who has used similar applications, otherwise it has to be provided in the instruction manual.
   2.2 A layman user will find it difficult to take notes so make it a bit more apparent by adding icons for note making.

3. View feedback and edit description
   3.1 If the user mistakenly deletes the complete description instead of editing, then he has to write the whole description all over again.
   3.2 The admin is able to view the feedback provided by other user groups and analyze it to make the interface more user-friendly.

4. Viewing multimedia and giving feedback
   4.1 In the evaluation majority users pointed out that the video is not well blended with the background. So, try to find a better background that goes well with the video.
   4.2 The user is able to give feedback about the user experience of different locations in the virtual tour.

Heuristic Evaluation

S. No.	Heuristics	Evaluation 1	Evaluation 2	Evaluation 3
1.	Visibility of system status	✓	✗	✓
2.	Match between system and real world	✓	✓	✓
3.	User control and freedom	✓	✓	✓
4.	Consistency and standards	✓	✓	✓
5.	Error prevention	✗	✓	✗
6.	Recognition rather than recall	✗	✓	✓
7.	Flexibility and use	✓	✓	✓
8.	Aesthetic and minimalist design	✓	✗	✓
9.	Help users recognize, diagnose and recover from errors	✗	✗	✗
10.	Help and documentation	✗	✓	✓

Visibility of system status

Evaluation 1: Current state of the system is visible such as user current location

Evaluation 2: Current status of the system is not visible for some instances like when the description is edited, it does not tell us if it is a success or a failure.

Evaluation 3: Current status of the system is visible such as the current progress of the user and whether they have completed the tour.

Match between system and real world

Evaluation 1: All the symbols used in the symbol are matched to the real world

Evaluation 2: All the symbols used in the virtual tour are same as the commonly used symbols in the real world.

Evaluation 3: We use cross symbol to close an application and back arrow to return to the previous state of the system.

User control and freedom

Evaluation 1: Once the description of a location is created, it can be edited based on user feedback.

Evaluation 2: Admin has control over the created descriptions.

Evaluation 3: When the user has completed the whole tour, a prompt opens which asks user if he wants to exit and press no if he wants to continue.

Consistency and standards

Evaluation 1: The app maintains external consistency with surroundings such as using a cross to close instruction manual.

Evaluation 2: Internal consistency is maintained in the application such as using cross sign whenever we want to close something.

Evaluation 3: This app maintains internal and external consistency.

Error prevention

Evaluation 1: No pop up is provided that ask us whether we want to save the changes made in the description. So if someone deletes it by mistake he has to type it all over again.

Evaluation 2: Pop up appears when the user has completed the tour whether he wants to exit or not and user can select no if he has marked locations by mistake and hence this prevents the user from exiting mistakenly.

Evaluation 3: There is no pop up to prevent any error.

Recognition rather than recall

Evaluation 1: While editing or viewing the description, and while giving the feedback, we cannot see any input field describing what is displayed there or what do we have to enter or edit.

Evaluation 2: We have icon to revert back to our previous state and an icon which we can use to change the theme.

Evaluation 3: The functionalities could be recognized the way it is presented in the application.

Flexibility and use

Evaluation 1: Since the application is quite simple in nature. Hence from novice to expert users all have the same simple interface.

Evaluation 2: It is flexible for both novice and experienced users.

Evaluation 3: The system is very simple and can be used by both expert and novice users.

Aesthetic and minimalist design

Evaluation 1: Only relevant details are given while traversing through the mini-map.

Evaluation 2: Only relevant information is given but the multimedia in virtual world does not blend with its background.

Evaluation 3: Only relevant information regarding the execution of some important functionalities is provided in the instruction manual.

Help users recognize, diagnose and recover from errors

Evaluation 1: No information is displayed when changing of description is failed.

Evaluation 2: It does not give any reason if we are unable to edit the instruction manual which makes it difficult to diagnose it.

Evaluation 3: If some multimedia fails to load, it does not give us the reason making it difficult to diagnose and recover.

Help and documentation

Evaluation 1: Proper help and documentation is not provided. Some of the instructions were missing in the manual.

Evaluation 2: Help and documentation regarding locomotion and teleportation in the virtual world are provided.

Evaluation 3: A user manual is provided as a help which a user can follow to execute different functions.

User Evaluation

Post task questionnaire

After Scenario Questionnaire (ASQ): It consists of three statements and users provide a rating on a 7-point rating scale which ranges from strongly disagree (rating=1) to strongly agree (rating=7).

We have used three users for the purpose of user evaluation.

The four tasks are mentioned above in the expert evaluation.

Task 1:

ASQ Questionnaire	Rating			Avg
	User 1	User 2	User 3	
I am satisfied with the ease of completing the tasks in this scenario	7	6	7	6.67
I am satisfied with the amount of time it took to complete the tasks in this scenario	7	7	7	7.00
I am satisfied with the support information when completing the tasks.	7	7	7	7.00
User average rating	7.00	6.67	7.00	

Task 2:

ASQ Questionnaire	Rating			Avg
	User 1	User 2	User 3	
I am satisfied with the ease of completing the tasks in this scenario	7	6	7	6.67
I am satisfied with the amount of time it took to complete the tasks in this scenario	7	6	7	6.67
I am satisfied with the support information when completing the tasks.	4	7	7	6.00
User average rating	6.00	6.33	7.00	

Task 3:

ASQ Questionnaire	Rating			Avg
	User 1	User 2	User 3	
I am satisfied with the ease of completing the tasks in this scenario	7	7	7	7.00
I am satisfied with the amount of time it took to complete the tasks in this scenario	7	7	7	7.00
I am satisfied with the support information when completing the tasks.	7	7	7	7.00
User average rating	7.00	7.00	7.00	

Task 4:

ASQ Questionnaire	Rating			Avg
	User 1	User 2	User 3	
I am satisfied with the ease of completing the tasks in this scenario	7	7	7	7.00
I am satisfied with the amount of time it took to complete the tasks in this scenario	7	7	7	7.00
I am satisfied with the support information when completing the tasks.	7	7	7	7.00
User average rating	7.00	7.00	7.00	

Post Session Questionnaire

System Usability Scale (SUS): It consists of ten statements out of which half are positively worded (1, 3, 5, 7, 9) and the remaining half (2, 4, 6, 8, 10) are negatively worded. Here user provides a rating on a 5-point rating scale which ranges from strongly disagree (rating=1) to strongly agree (rating=5).

S. No.	SUS Questionnaire	Rating			Avg
		User 1	User 2	User 3	
1.	I think I that would like to use this system frequently	3	4	5	4
2.	I found this system unnecessarily complex	1	1	1	1
3.	I thought the system was easy to use	5	5	5	5
4.	I think I would need the support of a technical person to be able to use the system	1	1	1	1
5.	I found the various functions in this system were well integrated	5	5	5	5
6.	I thought the system was too inconsistent	1	1	1	1
7.	I would imagine that most people would learn to use the system very quickly	4	4	4	4
8.	I found the system very cumbersome to use	2	2	2	2
9.	I felt very confident using the system	5	5	5	5
10.	I needed to learn a lot of things before I could get going with this system	1	1	1	1
	SUS Score	90	92.5	95	92.5

SUS Score formula:

$$S = \left(\sum_{i=1,3,5,7,9} (R_i - 1) + \sum_{i=2,4,6,8,10} (5 - R_i) \right) \times 2.5$$

R_i= Rating for i^{th} statement