

Game Design Document

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Name of the Game: Lost Between Worlds

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1 Overview

1.1 Game abstract

The character awakens in an unknown world without any memories. The player needs to find all hints of his past by traveling through portals onto other planets, collecting information and accomplishing quests to find their way home through one gate. The players mindfulness and their decision will finally decide if they win.

1.2 Objectives to be achieved by the game

The game itself starts after the introduction with an escape mission, where the player needs to escape, but in the end of the story ends up to incapacitate the NPCs they once fled of. Furthermore the quests in itself can be capturing, in regards of collecting a material while not being killed by animals. At last the objective of alignment is achieved with missions, where the player needs to solve puzzles, by adjusting the placement of blocks to create a pathway. In the end the user needs to explore every part of the possible planets, to find enough hints for a solution to complete the main story mission.

1.3 Core gameplay

The core of the game is exploration as the player needs to travel through the portals to visit other planets, thus for quests in which they need to finish a puzzle or need to strategically collect items as well as finding hidden messages, which create hints the player needs to connect to win the game. In itself the game creates fun in providing explorations and puzzles the player need to solve.

1.4 Game features

The principle characteristic of the game is to explore planets by using portals, while getting to know the character, learning about other worlds and solving puzzles.

1.4.1 Genre

The game itself can be oriented in the RPG genre. It has no set rules to limit the player, they can freely move around between the worlds, choose to not give the quest offeror the collected materials and can choose to not follow the game lead, or can kill NPCs, but this way they may not end up finishing the story line. Furthermore the player could even decide to not finish more quests to find the correct portal hint and decide to use one at random choice. The only limits are the world map containment's, as the playable space on the planets is not endless and that the player can't live forever (oxygen level).

1.4.2 Number of players

The game is just playable in single player versus game.

1.4.3 Game theme

The game theme is wide spread, as the first planet looks like a field of wonders without other life, while the second planet looks like a Martian desert with sand building or the primeval times planet. As a conclusion the theme can differ in every sense of aesthetic through every portal.

1.4.4 Story summary

The story builds up on the character having no knowledge of their past. This creates the craving of the player to understand what happened, to complete the story while enjoying the landscape. The game starts with an exposition to a blank slate, whereas the player is dropped in an unknown world. After the player finds their way through the first portal the story begins to

have a rising action/climax, when the player is chased by NPCs. The quests themselves create similar climaxes, however the story line itself is a constant. The resolution comes to play when the player found every hint, comes back to the start and enters the last portal of the game.

2 Mechanics

2.1 Game elements categories

2.2 Rules

The player can choose to not give the quest offeror the collected materials and can choose to not follow the game lead, or can kill NPCs, but this way they will not end up finishing the story line. Furthermore the player could even decide to not finish more quests to find the correct portal hint and decide to use one at random choice. The only limits are the world map containment's, as the playable space on the planets is not endless and that the player can't live forever (oxygen level).

2.2.1 Interaction rules

Valid can be every interaction, players do not need to finish quests, nor do they need to return collected items, but in the end they do not know if they miss a hint to win the game.

2.2.2 Artificial Intelligence

The used NPCs can be human-like standing upright and talked to or other creatures referred as animals before. Some may attack you from both categories, but most do not interact with the character. The ones the player can talk to are related to quests, which when interacting with the key q talk to you with a text that opens on the players user interface with the dialog option to accept or decline the offer. The used NPCs have a scripted behaviour, as the Martian planet predefined AI will follow the player and kill them. In general the NPCs don't react to the players behaviour, disregarding levels where animals will attack the player on approach.

2.3 Game world elements

Transportation:

For the transportation between worlds inside the game a portal system is used, which lets the user travel instantaneously to other scenes.

Otherwise the user can jump and run.

Collectables:

Collected can be minerals, as well as weapons, audio messages, letters, health potions, armor and oxygen capsules

2.4 Game log elements

The player progression is generally displayed in the players level and their inventory, regarding medikits, oxygen capsules which in general shows the players progress.

2.5 Other elements

2.6 Assets list

- Spacesuit character model
 - <https://assetstore.unity.com/packages/3d/characters/humanoids/sci-fi/stylized-astronaut-114298>
- Weapon models

- <https://quaternius.com/packs/scifigun.html>
 - Laser Model <https://assetstore.unity.com/packages/tools/particles-effects/volumetric-lines-29160>
- Collectable models
 - <https://assetstore.unity.com/packages/2d/textures-materials/2d-free-crystal-set-175156>
 - <https://quaternius.com/packs/survival.html>
- Nature assets (small plants, trees etc.)
 - <https://assetstore.unity.com/packages/3d/vegetation/trees/low-poly-styled-trees-43103>
 - <https://assetstore.unity.com/packages/2d/textures-materials/nature/grass-and-flowers-pack-1-17100>
- Ground (for every planet style)
 - <https://assetstore.unity.com/packages/2d/textures-materials/tiles/hexlands-low-poly-style-133586>
- Houses (for every planet style)
 - <https://quaternius.com/packs/spaceships.html>
 - <https://quaternius.com/> (Ressources aren't visible on the website, but were included in the patreon package.)
- Sky boxes (for every planet style)
 - <https://assetstore.unity.com/packages/2d/textures-materials/sky/fantasy-skybox-free-18353>
- Different NPC styles (human like, animals)
 - <https://quaternius.com/packs/animatedalien.html>
 - <https://quaternius.com/packs/animatedmech.html>
 - <https://quaternius.com/packs/animatedrobot.html>
- Background music (part of the HUMBLE BIG ROYALTY-FREE MUSIC BUNDLE)
 - Archives VOL 1 THE DARK SIDE by Nicolas Jeudy - Dark Fantasy Studio
 - The vanishing of Elisabeth Rose - Dark Fantasy Studio

3 Dynamics

3.1 Game World

Furthermore the aesthetics of the game can differ on every planet. The first planet is a portal mega hub, while having untouched nature with a variety of plants, no NPCs and no night and day cycles as the planet is surrounded by ten suns, which gives the plants the energy to grow, while being uninhabitable for living creatures to survive the constant radiation. The second planet resembles a red martian surface with a city of orange sand houses, nearly no living plants and so no breathable air neither. The third and mostly quest planet resembles a safe environment for the player in most regards and the described primeval earth looks like a plant, creature paradise similar to the Rocky Mountains on earth. Furthermore there is the possibility to spawn in space next to a star.

3.1.1 Game theme details

The textures of the environments are being held simple, but oversaturated. Every planet has its own specific sound track to underline its atmosphere, as well as every other game interaction has its own sound.

3.1.2 Missions/levels/chapters Flow

The players movement is strictly scripted till the quest planet, from then the player can freely move around and can do every quest they want. Furthermore the player can chose themselves if they want to finish the game and that they know which portal in the first world to chose. In general they just need a weapon to challenge the NPCs on the second planet, oxygen for the air and the item to activate the wanted portal for this to work.

3.2 Missions/levels/chapters elements

3.2.1 Objectives

The objectives in itself can be capturing, in regards of collecting a material while not being killed by animals. At last the objective of alignment is achieved with missions, where the player needs to solve puzzles, by adjusting the placement of blocks to create a pathway. In the end the user needs to explore every part of the possible planets, to find enough hints for a solution to complete the main story mission.

3.2.2 Rewards

Rewards for quests can be weapons, hints for the story as well as needed resources for titrium, medikits, experience points and oxygen.

3.2.3 Challenges

The main challenge of the game is a puzzle, which is divided into small different ones that need to be solved to finish the story. Furthermore the quests can also be fights against NPCs.

3.3 Special areas

Special areas are in itself the first game world in which the player needs to return to finish the story as well as the quest planet on which the player can move freely without having to be scared of getting attacked by NPCs.

3.4 Game interface

Looking at the interface from the left to right, the player can manipulate the helmet of the character which can result in death, but also can help save oxygen capsules. Followed by the recent quest and level. Afterwards the quick access area of the inventory is displayed, whereas the player can open a bigger window to look at more items. And the last item on the right hand side is the environmental analysis monitor, so the user knows if the planet is save to breathe.

3.5 Controls interface

Getting a more in depth look into the game controls, as in how the user can control the actions. Movement is done with the keys **w**, **a**, **s**, **d**, whereas space is for jumping and shift for running. Furthermore the character can do a flip with **w + shift + space**. Users can collect items, read letters/audio messages (not implemented) or interact with NPCs with the key **e** and attack with the left mouse click (not implemented), as well as scope with the weapon with the right click (not implemented). To remove the space suits helmet, the user needs to press **h**. Furthermore quest interactions can be started with **q** for quest and the portal travel can be started with **t** for travel. The inventory can be opened with the key **i** (not implemented). Quick access to

inventory items can be achieved by moving them into the bar underneath, which contains up to eight elements. This option allows users to use them by pressing its number on the row (**1, 2, 3, 4, 5, 6, 7, 8**)(not implemented) or via mouse click. In general all displayed interface elements can also be interacted with, by using the left mouse button. The companion can seek and hunt flocks by pressing the key **y**.

3.6 Game Balance

The game difficulty can be in general increased by increasing the scarcity of the oxygen capsules, so the player has less time for every quest. Furthermore the attack damage of NPCs can be increased. Last but not least the amount of items rewarded for quests can be decreased and such elements being found on the planets as well.

4 Visuals and Sounds

4.1 Game visuals



On the left bottom side the recent status of the helmet is displayed, beside it the recent task and level is shown. In the middle of the bottom the main panel positioned showing the inventory, health and oxygen status. On the right hand side the recent air quality is shown, however for now it is just in a string instead of a graph indicating friendly or hazardous environment. The main player is portrait in a space suit and the first quest offerer is portrait in a general alien like figure. Moreover the first landscape is a sand desert for now. The menu is structured into a play button as well as a controls view (see Figure 1).



Figure 1: Menu

The quest is displayed with a panel including the information needed and an accept task, cancel and a get reward button (see Figure 2). Last but not least the game includes three



Figure 2: Quest interaction

previously mentioned planets, whereas the following screenshots give insights to the looks of it (see Figure 3, Figure 4 and Figure 5).



Figure 3: Portalhub planet



Figure 4: Danger planet



Figure 5: Quest planet

4.1.1 Animations

Starting with the menu, the controls window uses a Tween animation for showing it. On Games-tart the helmetView, taskView, mainpanel (with inventory etc.) and environment panel each have their own Tween animations being played automatically.

The statistical bars being the experience, oxygen and health level are all being animated by Mathf.Lerp animations on every *Update()* trigger, according to their new target value.

Regarding the first mineable item, when it is mined, the y position of the item is being animated with the *Vector3.Lerp* functionality on every *Update()*, when the target position was not reached yet. As well as triggering a mining animation on the player model, moving its body and a shovel. Furthermore adding/collecting inventory items will start a Tween animation based on scaling the object in. The portals and transport scene use a set of VFX graph animations. The primary graph is being played continuously in the background, while the transportation triggers the loading game-object to display additive over the other scene, to load it in the background (see Figure 6). Furthermore the loading bar is animated over a duration of three seconds. Finally



Figure 6: Portals

the player uses a *PlayerController* animator, which controls the animation being played for the model. In this case the controller is a script, which listens to every pressed key. The animator in this case will play the desired animation according to set booleans.

- walking animation (w)
- running animation (left shift + w)
- jumping animation (space or w + space) (see Figure 7)
- flipping animation (left shift + w + space)



Figure 7: Running particle animations

Whereas most animations were imported from the asset model itself, the mining and weapon holding animation were added and created within unity (see Figure 8). Moreover a animation event is triggered on the 8th frame of the run Tween. In this case a VBX graph is activated, further visualizing the motion of the player under the models feet.



Figure 8: Shovel and weapon

In the end, when the player selects a weapon from the inventory, it is also displayed in the players right hand, while triggering a holding animation. From here on every mouse click will be considered a shot, in the clicked direction. For the visualization lasers are being shot into the raycast direction of the mouse.

Furthermore the companion uses different animations, including walking on following, running on seeking, shooting on hunting and dancing on idle.

4.2 Game sounds

The game does not use any sounds for interactions at this point, however every scene has its own musical background to bring the player into the atmospheric environment of being in danger or on the run for a quest. Thus the tension is already being built up in the menu and increased with every travel/loading animation. The music is intended underline the situation the player is in, on every planet. Even if the so called "danger planet" does not contain dangerous activity at this point, the player is already informed about its state while entering it.

5 Document information

5.1 Definition, acronyms and abbreviations

Term or abbreviation	Definition and acronyms
NPC	Non-player character
RPG	Role playing game
Portalhub	First planet in the story
Danger planet	Second planet in the story
Quest planet	Third planet in the story
Tween	interpolation between two values
helmetView	Panel visualizing the helmet of the character
taskView	Panel visualizing the recent quest texts
VFX Graph	Unity Visual Effect Graph

Table 1

5.2 Document references

Related resources from asset list:

- Spacesuit character model
 - <https://assetstore.unity.com/packages/3d/characters/humanoids/sci-fi/stylized-astronaut-114298>

- Weapon models
 - <https://quaternius.com/packs/scifigun.html>
 - Laser Model <https://assetstore.unity.com/packages/tools/particles-effects/volumetric-lines-29160>
- Collectable models
 - <https://assetstore.unity.com/packages/2d/textures-materials/2d-free-crystal-set-175156>
 - <https://quaternius.com/packs/survival.html>
- Nature assets (small plants, trees etc.)
 - <https://assetstore.unity.com/packages/3d/vegetation/trees/low-poly-styled-trees-43103>
 - <https://assetstore.unity.com/packages/2d/textures-materials/nature/grass-and-flowers-pack-1-17100>
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 - <https://quaternius.com/packs/animatedrobot.html>
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6 Study

For the study the following questionnaire was provided via Google Forms, as previously mentioned 17 participated in the study. They all have been equipped with the final game version, which was playable under Windows, Linux and macOS. Afterwards they needed to fill out the evaluation.

6.1 Questionnaire

Questions	Answers
How do you identify yourself?	<i>Female, Male, Nonbinary, Prefer not to say</i>
How often do you play video games?	<i>everyday, every second day, twice per week, once per week, once every two weeks, once per month, less than once per month, Never</i>
Did you enjoy playing the prototype?	<i>strongly disagree 1 - 5 strongly agree</i>
Did the teleportation sequences make you feel like traveling into another world?	<i>strongly disagree 1 - 5 strongly agree</i>
Did you finish the quest?	<i>Yes, No</i>
Do you agree with the statement: You felt like you have been put into an unknown scenario without any knowledge of what happened and why you are there?	<i>strongly disagree 1 - 5 strongly agree</i>
The difficulty of the game was:	<i>too easy 1 - 5 too hard</i>
All 13 questions from the EC-2021-Simple-Game-Evaluation example	<i>strongly disagree 1 - 5 strongly agree (no value for I don't know)</i>
Did you managed to find the way home? Which was the final message?	<i>* No, I haven't. * You have been tricked. You ended up in outer space. * You finished the game! Congratulations! * You found your way home! Congratulations! You have won the game</i>
Did you manage to let the character die?	<i>Yes, No</i>
Would you have played the game further, if it wouldn't be just a prototype?	<i>Yes, No, open field</i>
What did you like about the game?	<i>open field</i>
What didn't you like about the game?	<i>open field</i>
If you had the chance to improve the game, what would you want to do?	<i>open field</i>
How would you grade the prototype? (school grading)	<i>1 - 6</i>

For the calculation of the mean and median, the answers needed to be coded into numbers. As the gender results only included "female" and "male", the coding would be female (1) and male (2). While having 17 participants, the standard deviation amounts to 0.44 and the median 2.0, thus mostly the male gender is represented. The question "How often do you play video games had eight possible answers, so numbering them in order results in a M of 3.0, and SD of 1.62, whereas most participants play twice per week.

The prototype enjoyment stands at ($M = 4.0$, $SD = 1.1$), the teleportation made most participants feel like traveling into another world ($M = 4.0$, $SD = 0.90$), the question completion rate stands at ($M = 1.0$, $SD = 0.49$), while Yes stands for 1, and No stands for 0. Most participants agreed with the statement of feeling unknown in the scenario of the game ($M = 5.0$, $SD = 0.49$). The difficulty of the game was rated as being normal, thus not too easy nor too hard ($M = 3.0$, $SD = 0.88$).

Coming to the imported questions:

- "I feel competent at the game"
($M = 3.5$, $SD = 1.03$)
- "I feel very capable and effective when playing"
($M = 4.0$, $SD = 0.966$)
- "My ability to play the game is well matched with the game's challenges"
($M = 3.0$, $SD = 0.83$)
- "The game provides me with interesting options and choices"
($M = 3.0$, $SD = 1.03$)
- "The game lets you do interesting things"
($M = 4.0$, $SD = 1.03$)
- "I experienced a lot of freedom in the game"
($M = 4.0$, $SD = 0.72$)
- "I experience feelings as deeply in the game as I have in real life"
($M = 2.0$, $SD = 0.88$)
- "When playing the game I feel as if I was part of the story"
($M = 3.0$, $SD = 1.0$)
- "When I accomplished something in the game I experienced genuine pride"
($M = 3.0$, $SD = 1.37$)
- "I had reactions to events and characters in the game as if they were real"
($M = 2.0$, $SD = 1.13$)
- "Learning the game controls was easy"
($M = 3.0$, $SD = 1.46$)
- "The game controls are intuitive"
($M = 3.0$, $SD = 1.54$)
- "When I wanted to do something in the game, it was easy to remember the corresponding control"
($M = 3.0$, $SD = 1.38$)

In conclusion regarding the imported questions the total median stands at 3.0 and the standard deviation 0.26, concluding in a neutral state towards the game prototype.

The question, if participants managed to finish the game was asked in a way, that they could only say "yes", if they in fact finished it. Apparently no one guessed the answer, thus most (70.6%) did not manage to find a way home ($M = 0.0$, $SD = 0.47$). Surprisingly even when 70.6% didn't finish the game, not the same amount of people managed to let the character die ($M = 0.0$, $SD = 0.51$). The same percentage of people would like to play the game further, whereas two participants added the field maybe ($M = 1.0$, $SD = 0.82$). In summary the prototype was graded as median 2.0 with a standard deviation of 1.33.

Looking at what was liked about the game: The music, animations, mystery and mysterious atmosphere were complimented, as well as the teleportation, camera angle, graphical detail, character movement (style), the game mechanics of handling oxygen with the helmet, the companion and "[...] the ambitions effort put into the game overall." (participant 5). Disliked were

the length, the missing information about how to finish the game, the "glitchy" controls, weapon aiming, over-complicated UI and the camera angle. Apparently the controls were in some cases not working completely, but it was just reported for Windows. Unfortunately I couldn't replicate it. Last but not least participants suggested to fix the quest bug, button bugs, adding speech to the companion, simplification of the controls, NPC movement, more quests, adding more environment details to the first world. The mentioned quest bug, not being able to finish it, when the item was already mined, the "glitchy" controls and the not working UI buttons on the final scenes were fixed afterwards. Significant changes to the game wouldn't have been possible due to the needed time.

In summary the game was overall liked by the study participants, however even if the difficulty of the game was stated as "normal", only 29.4% managed to finish the game, and 69.4% the quest. Furthermore the visual and auditory state of the prototype were seen as great, whereas the controls, UI, and the difficulty of the "story" were somehow viewed critically. The research hypothesis could partly not be met, as most participants did not finish the game, but the quest and the game world by itself.