**Game name:**

Unknown Abyss.

**Game overview:**

Genre:

Strategy.

Target audience:

Strategy game player; Simulation game player.

**Story, settings, and characters:**

Story and narrative:

Due to the random generation design of the world structure, there’s no typical story or narrative for the game. The advancement of the progress is based on the scale of the civilization instead of a specific story line.

In the future, a storyline or plot may be added into the game with a specific world.

Game mechanics:

Anything which is mentioned below as “randomly generated” is based on the seed controlled by the player. With the same seed and the same world generation settings, exact the same world will be generated. This feature ensures that the player has the chance to with either the same world (map) or a completely different world. The only thing remain unchanged is the physics law and game rules.

Firstly, we discuss how the game create the world before the game start.

1. Galaxy generation: the world is a single galaxy. The main structure for the galaxy is galaxy->planetary system->planets + star->planet surface + orbit docks. The galaxy is randomly generated, and we will provide as most settings as we can for the galaxy generation. Consider the world generation system of the game *Minecraft*.
2. Resource generation: The entire resource system is randomly generated. The player can control the total amount of the kinds of elements. We hope to see that the players who choose larger amount will spend longer time to develop their civilization and vice versa.

For the resource generation, the planets which are closer to the center of the galaxy will probably have more resources of higher level (Note: higher level doesn’t mean that this element is more valuable or more likely to develop a higher-level science/technology.) The total amount of resources on a single planet is randomly generated.

Before resource generation, when the player set the total element amount, we will generate the usages for every kind of element. The usages will cover everything we will find on any infrastructure. The usage properties of a certain element will affect the value of the technology.

1. Energy generation: The energy of every star in the game is randomly generated. The player can control the maximum amount of energy on a single star, and the largest lifetime of it. The stars which are closer to the center of the galaxy will have a larger amount of total energy, but it will also have a shorter life: The energy of a star is pretty connected to the size of a star, and the larger size of the star, the more violent nuclear reaction they will have, resulting in much shorter life. The total amount of energy of a star is also based on the number of planets orbiting around it.
2. Science tree generation: The entire science tree is randomly generated. The player can control the width of the tree by changing its average branch amount and the depth by changing the level of the tree. The width is also affected by the amount of the kinds of the elements.

Secondly, we are going to discuss the mechanics of the game:

1. Two basic rules for every civilization:

Survival is the most important goal of every civilization.

Every civilization will continue to expand and grow, but resource in the universe is limited.

The communication between civilizations is also restricted because of the “Suspicion Chain”:

[*https://philosophy.stackexchange.com/questions/18127/dark-forest-postulate-used-to- explain-the-fermi-paradox*](https://philosophy.stackexchange.com/questions/18127/dark-forest-postulate-used-to-%09explain-the-fermi-paradox)

“If A does nothing or proceed to contact, we note that there is a chance that technology explosion might occur in B's civilization. B might be able to surpass A technologically. Now since A has no way of knowing B's true intention, to ensure the first axiom A has only one optimal move: destroy any civilization when discovered.”

From this assumption we can conclude that the only thing that a civilization, which discovers another civilization, can do is to decide whether they are going to attack or not.

In the actual game, if we have multiplayer game mode, we will not restrict player-player communication, however, all the communications have speed limit.

1. Light speed limitation and balance:

Currently maximum speed of everything in the game is restricted to the speed of light, the speed of light is not the same “light speed” in our real world, but a fixed amount which can be changed. The light speed is also affecting communication. The player will only have a single headquarter during the entire game. The player can change its location. If a player has a large size of the controlled area, his order or controls for the border of his civilization will have lateracy. Every spacecraft will also have limited maximum speed. The cost to increase the speed of a spacecraft is linear proportionable to k-1/n^k. For instance, the player will have to cost the same amount of resource to increase the speed by ½, ¼, 1/8… and the speed will be ½, ¾, 7/8… of the speed of light and never reach it. This is a balance between the resource engagement for the speed and other technology developments.

In the future, communication faster than light and hyperspace jump for spacecraft may be introduced into the game. However, as the current settings is enough for the minimum requirement to run the game, we only leave a interface without actual realizing it.

1. Resource balance, science tree, information restriction and discover:

A very important mechanic in the game is that most of the information which is disclosed in other games is restricted from player’s access. Here we list some of hidden information in the game: The location of the planet or the planetary system in the galaxy; the location of the center of the galaxy; the way we generate resources on a single planet, the way we generate energy system of a star; the complete science tree, etc.

There’s two reasons about why we hide these information. First, hidden information give player more things to discover, prolong the gameplay. Second, hidden information, combined with random generation, provide infinite possibility and uncertainty. Hiding the science tree, we can design a way for player to develop science in a more natural way: Since every different world has different science tree and its undeveloped part is completely hidden, to development a science faster than other civilizations, a player needs not only more resource and energy, but also a little bit better luck. The history of gameplay won’t give player experience for finding shortcuts for development. This solved the main flaw of other technology tree design in other strategy games: once you played a game, you know which way is the best way for playing with the same civilization. The more you play, the less new things you will discover. For the resource, the player has to rely on the resource information on their planet to tell whether the civilization is spawned at the edge of the galaxy or the center of the galaxy. To develop the science for the civilization, the civilization spawned at the edge of the galaxy need to collect the resources of higher level of resource which they can only find it among those planets close to the center of the galaxy. Thus, the player must find a way to discover the location of the center of the galaxy.

1. Science, technology, infrastructure:

Before we discuss, we need to crystallize the idea of tangible resources and intangible resources. In this game, a tangible resource is defined as those things which has physical properties and are exist at a certain location. All tangible resources are restricted by the speed of light. On the contrary, the intangible resources are those resources attached to civilization itself, thus cannot be moved or stored, or restricted by law of physics.

Currently we have the following resources:

Intangible: Science Tree (Hidden, attached to the game itself), technology, relationship between civilizations, etc.

Tangible: Infrastructure, resource, energy, workers.

The player needs to discover the nodes on the science tree and transfer it to technology. The energy and resources used to discover a science node is rather fixed. But the cost to transfer a discovered science node to a certain kind of technology varies, depending on the level of the technology. The best usage of the technology and the value of it will be calculated from the way of its science node combination. Which means, different technology may have different value even if they are in the same level. There will also be a naming system for each technology, displaying how valuable the technology is (Like the weapon naming system in Borderlands/Borderlands II). When a civilization created a technology, it will be stored as a civilization’s intangible resources. The technology is gone when the civilization is dead. Once the player wants to build an infrastructure, he will choose different kinds of technology, combine them together and build infrastructure. The choices of technology are completely controlled by the civilization, or the player. The game will only show the efficiency of the infrastructure before the construction. The efficiency of any combination of technology for a certain kind of infrastructure depends on the usages of every technology in the combination. Any action above requires certain amount of resource and energy accordingly. The infrastructure mentioned here is familiar to the buildings of the other strategy games. The player builds them, place them on the surface of the planet or the docks (the orbit of a planet or star). The infrastructure has its own way to use and different status. Note that the spacecraft is also a kind of infrastructure.

1. The balance of the edge area of a civilization:

Every infrastructure is build with certain kinds of technology, after the infrastructure is build, the technology is stored as a special kind of information inside each infrastructure. When a battle between different civilization ends, if the winner colonized a planet which is formally controlled by the other civilization, the winner can extract technology from the undestroyed infrastructure left on this planet. This, combined with the need of building infrastructure, need player to find a balance when they try to build infrastructure on a planet close to the edge of his/her controlled area: The higher technology level of infrastructure built, the higher risk of more technology gets copied by another civilization if it failed to protect itself. The lower technologies combined in an infrastructure, the less ability of it. Thus, the player will use more resource to build more low-level infrastructure to get what he/she needs.

1. Three stages of a civilization:
2. Stage 1 – The civilization managed to survive on the planet, make it possible to colonize other planets among the same planetary system.
3. Stage 2 – The civilization managed to discover other planetary system and make it possible to make long range space travel.
4. Stage 3 – The civilization managed to control a collection of planetary systems and form a network among the controlled area.

Gameplay: