Specifications - Year Zero

Bearth Studio

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1 Introduction

1.1 Presentation of the Group

Bearth Studio is a video game development studio born on December 16, 2018. Composed of four members, its only claim is to carry out its first project, consisting of its first game: ***Year Zero.***
Coming from diverse and varied backgrounds, its members have di ff erent cultures and educations. Within ***Bearth Studio,*** we believe that our di ff erences contribute to a greater creative ambition and to a broader vision of our project as a whole, so that it is enriched by it. We will then be able to resolve the technical and artistic challenges that will arise during the development of ***Year Zero.*** Currently having only one project in progress, we remain focused on this one but it is always possible that in the future we will work together again on other projects so that ***Bearth Studio*** grows and continues to present quality games, witnesses of the common ambition that its members share.

1.2 Group name

Bearth Studio comes from the contraction of ***beyond Earth, "*** beyond the Earth "and ***birth,*** the birth". We then understand the meaning "birth, beyond the Earth". Closely linked to the name of his first game ***Year Zero, Bearth Studio***
then represents the birth or rebirth of humanity, beyond the known limits of the Earth. Wanting to name our group in relation to the name and theme of our first game, finding the name of the latter guided us to determine that of our group. This is why one only finds its full meaning with the other. The frame was then set for ***Year Zero,*** presenting a humanity that left Earth, seeking to live rather than survive. This departure is therefore year zero.

We made sure that the name of our group was taken from our first game so that it was he who defined the first codes of our studio as well as its peculiarities. We did not want, on the contrary, to find a name that only we could understand and that would not touch or mark the mind of anyone.

1.3 Bearth Studio and Year Zero logos

The logo of ***Bearth Studio*** is made up of three distinct parts. The first is the one we see at first glance: a stylized planet, surrounded by rings like the planet Saturn, for example. We then see that a rocket escapes from the orbit of this planet leaving behind

she a streak of color. The studio's name appears below in a digital, spatial and futuristic-looking font. The image we have of the logo, presenting our band, is simple and eye-catching so that the player remembers the studio logo. All of this having the characteristic of being refined and modern in order to show the main theme which is that of space, demonstrating the studio's continual propensity to be turned towards the future.

Regarding the logo of ***Year Zero,*** it is about a circle containing in its center the letter "Y" stylized in a slightly futuristic font which will remain that of our game. The circle then represents the "0" of ***Year Zero*** with the "Y". The colors used are in the same range as those of the logo of ***Bearth Studio.*** A rusty, metallic appearance has been given to the letter "Y" to match the idea of a future as a Metal Age. The slightly dirty appearance thus given can make one think of the old Earth left by its inhabitants in the history of the game.

Figure 1 - Bearth Studio logo

Figure 2 - Year Zero logo

1.4 Members of Bearth Studio

Bearth Studio is composed of four members from class C1, from the first year of the integrated preparatory cycle of the EPITA computer engineering school.

Group project manager, **Timothy Ribes** will have to use all his skills in order to create real cohesion within the group, to inspire and support his colleagues throughout the project. He will be in charge of the various sound aspects of the game.

Brimming with inspiration, but also not neglecting the work, **Nicola Bran- kovic** will take care of the writing aspects underlying the game and bring it to life for good as long as it is placed in its context, thus laying down a framework, a story and a universe. It is in relation to the work of all the other members of the group that Nicola will be called upon to work.

Mastering some software necessary for the proper development of the graphic and visual aspect, **Enguerrand Vié** will be responsible for the direction of the artistic aspect of the game. Having to ensure that each aspect of the game respects a kind of graphic charter, color codes, shapes etc.

Having previously acquired some experience with Unity, **Axel Ribon** will help other members whether it is from a programming point of view or in that of the management of the game engine. Also mastering object oriented programming. It will be, for these reasons mainly responsible for the main code of the game, which constitutes the body of the game.

2 Year Zero

2.1 Presentation

2.1.1 Origin

Before choosing the content, or even the universe of our game, we had to determine the genre. Nowadays, many of the world famous games are ***FPS,*** of ***First Personal Shooter,*** or shooting games with a first person view, seeing on the screen what the character being played sees. After a quick review of our knowledge and capabilities in terms of development, we concluded that we would not do a ***FPS*** because requiring much more resources and time for the same rendering, compared to a game of a kind

strategy. Each member of our group is passionate about real-time strategy games: ***RTS, Real Time Strategy,*** the idea of making one ourselves quickly came to us and we all agreed.
As for the world of the game, noting the absence of a real strategy game taking place in space, we decided to try to fill this void and create our own. It would then have been easy to reproduce an already existing game in the same universe but we preferred to recreate one from scratch, taking various inspirations but especially with a view to making a game in our image, which contains the mechanics that we wanted, in other words, that we make our own game.
We wanted to integrate an alien race into our game, drawing inspiration from insects such as bees with their way of making their hives and of organizing themselves, or even ants. The whole being seen from a large scale. We also thought about making our base terrain a sphere so that by moving the camera in one direction, we would come back to the starting point after a while, but we abandoned this idea because it could lead to in players motion sickness, similar to motion sickness.

2.1.2 Nature

Year Zero is a space strategy game in which several teams compete for supremacy in the universe. It controls buildings that produce units on a map with fixed boundaries.
The chosen game engine is Unity and the language used is CSharp (C). The artistic direction will be fanciful and unrealistic in order to give a dark but not shocking tone. The objective is to make the game all public. The cardboard aspect was preferred to realism in order to make the atmosphere of the game quite light but without losing the strategy aspect. However, we wanted to keep a certain degree of realism in order to keep a dramatic side in view of the history of the game. From a sound point of view the game will be quite epic with big catchy themes. But he will also juggle with calmer and more melancholy themes to recall the desperate condition of humanity. The epic aspect being purely fun and the dramatic aspect serving to reinforce the intentions of the scenario.

2.1.3 Purpose and interests

A Year Zero session lasts between 15 and 30 minutes on average. The game will combine pure strategy as well as dynamism in order to create a real notion of progression during the game. The time required for a game may seem long

Figure 3 - Cartoon but serious aspect
Endless Space 2

but it is necessary to give the players time to strategize and set up their base.

We also believe that speeding up the games would certainly make the game more accessible but also less demanding. However, we want to create a game that is easy to understand but difficult to master so that the player derives real satisfaction from defeating his enemies.

2.1.4 Year Zero in the history of video games

Year Zero is a real time strategy game. The genre has already been around for almost 40 years with the game ***War of Nerves !.*** But this one has democratized and renewed to find its current form with ***Warcraft*** released in 1994. Other saga of ***RTS*** famous were born as ***Age of Empires*** whose particularity is to be able to advance in the periods of history as the game progresses. We can still cite ***Age of Mythology*** taking place as its name suggests in a mythological context. More recently ***Battle for Middle Earth*** taking place in the universe of ***Lord of the Rings.*** But in the history of ***RTS*** we especially remember the saga ***StartCraft*** for its competitive aspect and ***Warcraft iii*** for having added the notion of "Hero" leading a few years later to the creation of a new very popular genre that is the ***MOBA, Multiplayer Online Battle Arena.***

2.2 Functional

2.2.1 Contextual reminder

Humanity has exhausted all the resources of planet Earth, abandoning it in its pollution. It was the scene of many wars leading to the virtual extinction of humanity. In a last hope, the remaining civilizations set out to conquer the universe to develop again. The starting point for the conquest of the universe and the rebirth of mankind is called
Year Zero.
During the main campaign the player will have to fight various battles with alien civilizations to become more and more powerful and to assert his supremacy. Its battles may resemble the classic game mode with the management of its base. The campaign can also be an adventure where the player controls a regiment of troops but without buildings the goal being to survive until the end of the mission. Still other missions will require the player to resist for a while in the face of waves of attacking enemies.

2.2.2 Game features

The goal of the player is to develop his civilization in order to destroy the enemy team (s). For this he will be able to collect resources in order to construct and improve his buildings, and thus form an army. The game will be broken down into two game modes. Single player mode and multiplayer mode.

Single player mode:

Countryside - The campaign will be divided into x missions which follow one another. Once the player has completed a mission, he can move on to the next and so on until he reaches the end of the game.
The di ff erent missions of the game will offer various objectives in order to break up any possible monotony:

- Classic missions will require the player to develop his base as well as his army to destroy the opponent.

- The survival missions are identical to the classic missions except that it will not be necessary to annihilate the enemy but only waves of troops in a given time. The player will be cloistered around his base and will not be able to attack enemy bases.

- Adventure missions provide a regiment of troops at the start of the game to the player who will have to use his strategy to cover the entire level while keeping at least one unit alive.

Quick Game - This mode corresponds to the multiplayer mode but offline. The only di ff erence being that only artificial intelligences can be encountered here (See multiplayer).

Multiplayer mode:
Heart of the game, this mode will allow players to try out their strategies against each other. The only game mode present will be the classic mode of the campaign mode with the difference that the artificial intelligences can be replaced by real players or not.

2.2.3 Progress of a game

We will describe a multiplayer game. A player must create the game from the game menu. He must decide on the game card, the name of the game as well as the maximum number of players. Players wishing to join the game will have to enter its name in the appropriate menu to enter the "waiting room".

In this waiting room each player will decide on the color that is associated with him, the race of his civilization as well as his team. Then they will have to tick the box " ***Ready "*** to allow the player who created the session to launch the game. The players are then distributed randomly on the map.
Each player then has a space station as their main building. This will make it possible to produce builders who construct and repair buildings, but also undermine resources for the player. The station can be improved to become more resistant but also and above all to be able to unlock new buildings to build.

The player will also have to develop his improvement tree which will allow him, via a resource cost to unlock new units, to improve them as well as to unlock various production improvements on his buildings.
Manufacturers will therefore be able to mine various resources on the asteroids present on the map. Each asteroid contains a particular resource. These resources are necessary for the construction of buildings and units, but they are not inexhaustible. By dint of being mined the asteroids will destroy themselves forcing the player to find others.
The player just has to select a constructor and assign it an asteroid so that it makes round trips to the nearest space station so that the resource of this asteroid is stored.
There is another resource that is food, not found in space, the player will have to build space farms that will raise livestock for

produce meat at regular time intervals.
Finally the player will have to pay attention to the population. Indeed, each unit has a population value, and the sum of the population values of all the units cannot exceed the maximum population of the base.
The maximum population of the base will depend on the number of accommodation buildings present. With a ceiling of 100 which cannot be exceeded. Other buildings will be constructible and in particular to produce di ff erent types of troops.

Each of its buildings will be provided with a rally banner, so each unit produced will travel to that rally point. As for defense, the player will have at his disposal the possibility of building defense turrets which will automatically attack enemy troops nearby. The player can also place sentries that will alert him to the presence of enemy troops. Because in fact, being in space, the player does not have the possibility of building ramparts, he will not be able to take refuge behind it but will have to prepare his defense in order to survive. Hence the relevance of properly placing your sentries to give it maximum time before the imminent attack.

Buildings are not equipped with thrusters and therefore cannot move around on their own. They will therefore be in orbit around the space station.

2.3 Technical and Methodological Aspects

2.3.1 Material resources

We will be using a variety of materials to develop our game. So Visual Studio will be used for the code part, Blender for the 3D modeling, Photoshop for the design and Git for the " ***versioning "*** of the project. Everything will be assembled to build the game with Unity. We have 4 laptops at our disposal as well as the EPITA premises. For our research we will use the Google search engine. EPITA provides us with editions of Windows 10 as well as an O ffi ce 365 license which will be used to organize ourselves schematically on the construction of the game.

2.4 Intellectual Means

To help us during development we will have access to ***MSDN*** for everything concerning the C language. Unity provides a documenta-

tion for its use and we will also be using a lot of forum threads already created and resolved. These forums are mainly from the Unity and StackOver fl ow sites. These resources allow us to benefit from the experience of others to learn faster. We can also use explanatory videos on certain aspects of Unity that have not been mastered or on other software that we will have to use.

2.5 Economic Means

The game will not be monetized in any way. Everything will be free with no additional paid downloadable content, subscription or " ***lootbox ".*** We believe that the success of the game alone would be a reward and if so, an advertising showcase highlighting the studio.
The base game is not paid for the simple reason that it is the result of a school project and we do not believe that this type of project should be paid.

3 Project breakdown

3.1 Task progress schedule

Support task	**Defense 1**	**Defense 2**	**Defense 3**
Graphics	30	60	100
His	20	70	100
Menu	60	80	100
Network	50	70	100
AI	10	60	100
Game mechanics	60	70	100

3.2 Table of distribution of tasks

	Timothée	Nicola	Enguerrand	Axel
Graphics				
Troops			X	
Buildings			X	
His				
Sound effects	X			
Music	X			
Interfaces				
Main Menu			X	X
In-game menu			X	X
User interface			X	X
Controls	X	X	X	X
Network				
Lobby			X	X
Online	X			X
AI				
Bots	X	X		X
Automatisms		X		X
Game mechanics				
Selection		X		X
Resources				X
Combat		X	X	
Construction / Production				X
Content				
Map			X	
Countryside	X	X		
History		X		

3.3 Development on distributed tasks

3.3.1 Timothy

Not presenting any particular quality, I devote myself to the role of project manager aiming to help my colleagues as best as possible thus facilitating mutual aid, communication and cohesion which are fundamental principles for a group project. However, I play the guitar and will therefore use my musical abilities to take care of everything that has to do with the sound in the game, that is to say to create an atmosphere specific to the game. ***Year Zero*** and touching for the player with adapted music, with a futuristic tone but also with the tension that this kind of game creates throughout a game. As part of learning C # at EPITA, being able to apply it in a concrete context of this game in subjects allows me to deepen it and discover more complex subjects. In fact, with Nicola and Axel, we are going to have to code sufficiently powerful artificial intelligences so that they can give difficulty to the player alone without exceeding him too much. Finally, once the game is functional in its multiplayer part, with Nicola we will have to script parts to make it a solo adventure that would seem minimalist compared to professional editions of this genre, but will still allow us to express the own universe. ***Year Zero***
developed by the e ff orts of the whole group.

3.3.2 Nicola

Being a big consumer of real-time strategy games (***RTS)*** I dedicated myself to game mechanics and AI to make our game fun to play and balanced. A ***RTS*** Often requires performing multiple actions at once, allowing players to order buildings or units to perform multiple tasks one after the other, quickly, is a key part of the gameplay of a strategy game. Thinking about how the game's mechanics work and transcribing them into an algorithm and then into C # is enriching and pushes our team to constant mutual aid and to debates on the limits of this automation between Axel, Timothée and me. Also taking care of the campaign and the history of our game, I will have to work hand in hand with Enguerrand and Timothée in order to provide a certain coherence with the musics, the themes and the designs. Our goal is to give a soul and a unique atmosphere to our game in order to provide a unique experience for players,

3.3.3 Enguerrand

Possessing above all qualities of graphic work, my work in the project ***Year Zero*** will be particularly focused on the graphic aspect of the game. I am in charge of all the 3D modeling with regard to the 3D models of the units and those of the buildings. Helped by Axel, I will also have to take care of dressing the game interfaces including menus, buttons, interface in a part etc. The whole in order to create a futuristic, spatial atmosphere, with obviously the colors which relate to it. The same work will be done in parallel on the menus of " ***lobby"*** multiplayer. I will also be in charge of a programming point of view, of the whole combat system of our game, helped this time by Nicola. It will then be a question of making the units interact with each other, so that the combat is alive and dynamic. One aspect that combines programming and graphics is the dynamic generation of environments, of the game map. Wanting to integrate a system of random generation of maps so that the player never tires of replaying a game of ***Year Zero,*** I will also be responsible for developing such a system.

3.3.4 Axel

My work in the team will be above all algorithmic. I take care of certain mechanics on which my colleagues will rely to do their work. I am therefore responsible for providing them with their own code and being able to explain it to them. I think that communication is essential to be e ffi cient and productive and my work illustrates this need in the sense that it guarantees that we exchange on our work. In addition, my work also includes the interface with the user and therefore invites me to put myself in his shoes and ask those around me for their opinion. Although at first glance very abstract, my tasks require both technical and social qualities.
So I am in charge of the unit selection algorithm which is the mainstay of the game in the sense that any added content requires unit selection in order to be tested.
I am also responsible for the development of the menu code. This task may seem simple at first glance but the goal of a developer is not only to make the game playable but also to facilitate the work of others by coding a very adaptive and easy to use system. Everything must be developed so that once the algorithm is finished there is no longer any need to touch the code but only the interface and in the simplest and fastest possible way. I am also in charge of what has been called the automatisms. These are slight notions of artificial intelligence in units. We can for example cite the sys-

patrol, the reactions of units when enemies approach or their ability to mine and bring ores back to the space station. The notion of intelligence being too weak to be called artificial intelligence and the fact that these reactions are totally dissociated from the actions of the player, we preferred to dissociate these two parts.
However, I am also responsible for the artificial intelligence of the players controlled by the computer. I would not have the main role in the sense that I will not deal with the content but with the form, that is to say to render in code what has been schematized. We think this is a necessity because the AI relies on the code that I develop overwhelmingly and I am therefore the one who masters this code the best. The AI being one of the most delicate and complex features of the game, it is better to make the task as easy as possible with my knowledge. I also develop everything related to the production of units and buildings, ranging from the display of the cost of these to the production through a mode of placement of building in the base, as well as the operation of the associated interface.

Another part of my job is to implement multiplayer. And all that it implies to know the menus to create or join a server as well as the waiting room where the players can choose their race and their team. But multiplayer is mainly implemented throughout the game and in the management of the game. It is also a massive work in terms of optimization to avoid possible latencies during the game.
To sum up, I take care of multiplayer, unit selection, the interface from a code point of view, the construction of its base, the management of units as well as their production and their capacities. Finally, with Timothée and Nicola, I take care of the artificial intelligence of the enemy as well as the interface in general. I am above all a coder and not an artist, which is why this aspect of the creation of the game is not attributed to me.

4 Conclusion

Beyond the desire and the excitement of being able to make a video game, this project also and above all allows us to create and manage a project of a certain size in a group; to be able to move forward together and discuss to deliver a quality game that is entertaining.
We have always lived in science fi ction with sagas like ***Star wars*** or ***Star Trek*** who rocked our childhood. However, the video game industry has not seen for a very long time ***RTS*** spaces corresponding to these criteria. We are committed to doing our job well and being able to release a game that matches what we have always wanted to create.