

Design Document for:



(Logo: source: [8])

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1 Introduction:

1.1 What is our game?

Our game is called VINCIT ASTRA which means “conquer space” in Latin. Our target audience’s ages ranges from **16 to mid-twenties**, and the desired art style is **photorealistic**. The game is a **science-fiction First-Person shooter (FPS) in virtual reality (VR)** and takes place in **outer space** on a **space station**, in the **year 3072**. Here the player battles soldiers of an enemy faction, with an overarching goal of **escaping** the space-station under **time pressure**, while potentially completing **two additional objectives**. If the player manages to escape but completes zero objectives he/she will be rewarded with **one star**. Completing one of the additional objectives will earn the player **two stars**, and achieving both will grant them **three stars**.

1.2 Background for choses:

For this project we came together to brainstorm ideas. As all of us are huge fans of videogames and have played them throughout our childhood, this project is exciting to us. We wanted to explore a route that we think has great potential for the future of gaming. The idea we landed on is a first-person shooter game in virtual reality. We wanted to do an FPS as we are all fans of the genre, but agreed that it should be in VR.

VR is something we believe is still scratching the surface of its potential. The FPS genre is very popular and has many of the most famous games and franchises connected to it. Games like Call of Duty, Battlefield and Halo are among the most known franchises. Still, we have yet to see a VR FPS game gain the popularity other FPS games have achieved. Our goal in this project is to explore the potential of VR FPS and make a game that uses the advantages of VR to branch out in the FPS genre.

2 Market research:

2.1 Target Audience

VINCIT ASTRA is targeted for gamers between the ages of 16-25, regardless of the regions where the game is sold.

2.1.1 North America (ESRB):

VINCIT ASTRA is expected to be assigned a rating of TEEN (13 and up) by ESRB, a system which is predominantly used in North America and Mexico. Quoting their official definition for this rating:

“Content is generally suitable for ages 13 and up. May contain violence, suggestive themes, crude humor, minimal blood, simulated gambling and/or infrequent use of strong language.” – ESRB: Source [28]

That seems to be quite on par with the elements and/or features of VINCIT ASTRA.

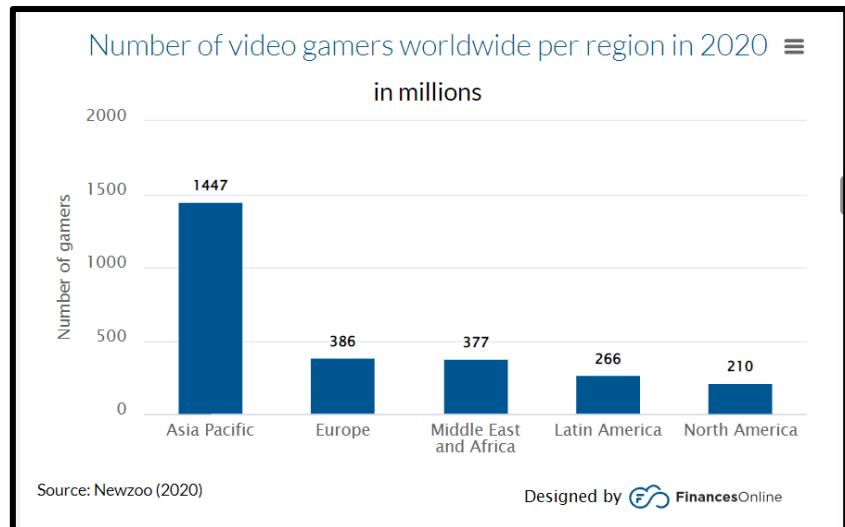
2.1.2 Most of Europe (PEGI):

A close competitor to VINCIT ASTRA (both in recency and content) is Star Wars Jedi: Survivor. This game is given a PEGI 12 rating on Steam but PEGI 16 rating elsewhere. Thus, there is more of a “grey area” with PEGI’s ratings compared to ESRB. We do, however, expect VINCIT ASTRA to be rated **16+ by PEGI** due to the violence and bad language it contains.

To guarantee a rating not above 16 and perhaps less – so as to maximize profit - our game will be **free of blood** and **body dismemberment**.

2.1.3 Asia Pacific:

Asia Pacific make the majority of gamers worldwide, and is, thus, likely to be reflected in our customer base as well.



(Source: [1])

Most of Asia Pacific has their own rating system, but we expect VINCIT ASTRA's rating to be similar to the previously mentioned systems.

1. Gameplay and context:

When discussing the “upper” age limit for VINCIT ASTRA, most FPS gamers are within the ages of 20 – 39 years (according to a 2023 report from Statista) [2]. A different study from Statista also discovered that most FPS gamers are male, 66% to be exact. However, our expectation is that VINCIT ASTRA will most likely not attract gamers in their late twenties and above, due to the lack of grotesque and hyper realistic violence compared to most AAA video games such as Call of Duty and Battlefield. It is also assumed that the context of VINCIT ASTRA being in space might detract older audiences since space-centered video games stereotypically have a more child-like appeal (e.g., Star Wars Battlefront, Star Wars Jedi series, No Mans's Sky etc.) These are just assumptions, however, as there is limited research on such inquiry.

3 Platform:

Naturally, the platforms that VINCIT ASTRA supports, are the ones that can run a VR headset. This includes Windows machines, PlayStations and so on. However, we must limit our platform range to just Windows machines at this point. In later stages, we can hopefully expand the game to support more VR platforms. Our decision to go with Windows machines is because we are developing VINCIT ASTRA in Unity where everyone in the group is also running Windows. Therefore, the natural choice was to keep the development environment as familiar and simple as possible.

3.1 Examples of VR equipment:



(HTC VIVE VR kit: source [10])

3.2 Example of in-game VR gameplay:



(Source [11])

4 Business aspect:

4.1 Monetization model:

From a financial perspective, the households of our intended demographic are assumed to be wealthy. Although VINCIT ASTRA is expected to be priced at around 40\$-60\$ (which is normal in the gaming market), the costs required to experience VR can be extraordinarily high. This includes the purchasing of the VR headset itself along with its peripherals, but also having an environment that enables VR gaming (e.g., fast and stable internet, and a big space).

Standalone VR headsets will not be powerful enough to satisfactorily run a graphically intense game such as VINCIT ASTRA which has a heavy emphasis on visuals. Most high-end headsets for PC, such as the HTC VIVE Pro Full Kit, cost around \$1200 [27]. Additionally, a computer powerful enough to run our game is most likely within the range of \$1000 to \$2000. For the potential platform expansion, it is slightly less expensive with PlayStation VR2 (ca. \$600), but it is required that the customers also own a PlayStation 5. Having VR as our chosen platform for deployment also indicates that our target audience consists of “serious” gamers due to the high costs regarding the free real estate required to properly and safely game in VR.

4.1.1 VINCIT ASTRA and Arcade:

However, to mitigate any exclusion of potential customers and attract middle-to-lower class gamers, VINCIT ASTRA can also be easily integrated into Arcade settings: the game is fun to watch as a bystander, and its win/lose conditions make the playthrough naturally competitive and quick.



(Source: [3])

4.1.2 Incentive to play VINCIT ASTRA:

According to a study from Finances Online, 80% of gamers play video games because it “offers mental stimulation”, and 79% claims that it “offers them relief from stress and relaxation”. VINCIT ASTRA being a space game with stunning visuals and a celestial setting, could provide the mystique and escapism that most gamers desire. This gives VINCIT ASTRA a great chance of accumulating a substantial user base.

Another major factor, according to the study, is the joy that video game provides; with 55% of gamers citing that as an important factor. The high pace and action-filled gameplay of VINCIT ASTRA will surely provide that as well. 63% of gamers also reported that video games help them solve problems. The meaning of this is quite unclear, but one could claim that this statement is about how some video games

encourage players to think critically in-game and which might have positive ripple effects in real life. The win-lose conditions of VINCIT ASTRA certainly encourage creative thinking as the time limit imposed on players forces them to prioritize, plan and make rapid decisions in-game to get all the 3 stars.

The findings from the aforementioned study also indicate that social interaction is a major factor for gamers. 50% of gamers report that video games connect them with friends. Although VINCIT ASTRA is single player only, the imposed time limit might catalyst a competitive behavior amongst gamers, speed running the game to see who wins in the shortest time. This can be great fun and socially interactive (The same effect that most arcade machines provide – it is exciting, even as a bystander).



(Source: [4])

4.2 Sales/elevator pitch:

Introducing VINCIT ASTRA. One of the biggest video game genres combined with the amazing powers of virtual reality to give you a next level gaming experience. Immerse yourself in this future space adventure as you take on the evil OSION legion from within. With a new threat at every corner, alone behind enemy lines, explore a whole new way to fight as you take on the challenge. What you do is your decision. Go above and beyond The ATREA alliance is counting on you.

5 Influences:

When designing something of your own, we have noticed that you might come up with an idea with maybe little to no influence from something else, but as you go into further detail on the game you keep catching yourself drawing influence from other games or movies subconsciously.

Our game is a VR fps that is set in space, and while designing the story the influences came quite quickly. We drew gameplay inspiration from games like Call of Duty which has some levels with the same type of timed escape scenarios. Assassin's Creed and Hitman was also a source of influence into the story which starts off kind of stealthy before you are thrust into a more conventional style of fps with quite direct confrontational action.

As for the story and the wider "world" around, we ended up drawing a lot of influence from Star Wars, both the movies and tv shows. This influence is seen on the likes of where the game is situated, the general back story, how you escape and so on.



(Screenshot from source [12])



(Source [13])



(Source [14])



(Source [15])

6 Game overview:

6.1 The game world:

When we decided on the world of the game, we wanted it to have a futuristic sense. It makes sense when it comes to VR game as VR is very futuristic on its own compared to keyboard and computer controllers. The story is happening centuries into the future, but the problems of today are still relevant. There is a fight for resources and power across the universe. In the center of the war is two different fractions. On one side you have ATREA. ATREA is a united front formed by members of different planets and systems. They fight for planet independence and democracy across the universe. On the other hand, you have the OSION legion. Their goal is to unite space under one rule. They want control of all planets and systems and have one ruling council that makes decisions for all.



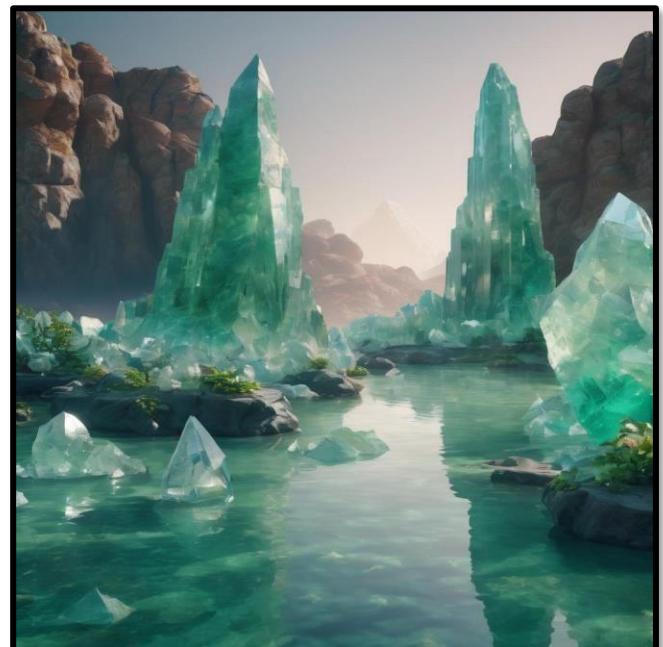
(Imaginary logo for the OSION legion (using word font))



(Imaginary logo for the ATREA legion (using word font))

6.2 Story background:

The war is in full bloom and our story starts on the planet Oscidar. Oscidar is known for its resources that are a key component in hyperspace travel. This resource is called fuel crystals. These crystals are a key factor in the war. The planet is a part of the ATREA alliance and is under their protection. Because of the valuable resource the OSION legion decides to attack with a large force and a multitude of motherships. The planet has ATREA troops and weapons stationed but they are not prepared for the large-scale attack from the OSION legion.



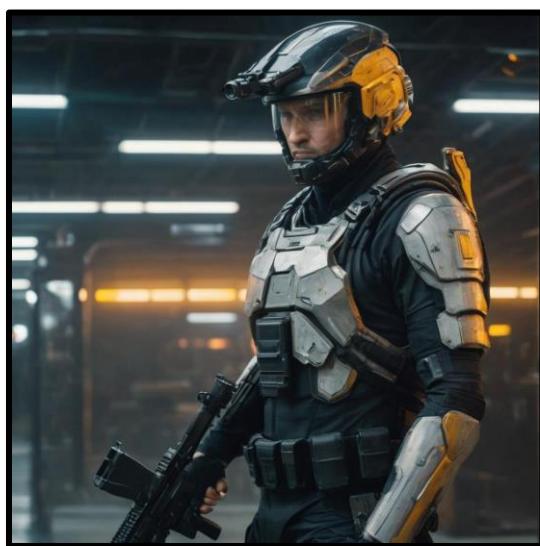
(Two imaginary pictures of the planet Oscidor with green fuel crystals – generated with the assistance of Gencraft: source [7])



(Imaginary picture of the planet Oscidor seen from space: source [6])

6.3 Protagonist background:

The character the player is playing as is an early-adolescent, male, human soldier for the ATREA alliance. His name is Major, and he is stationed on the planet to protect its resources. When the attack starts, ATREA mobilizes counter measures but it's clear that the enemy outnumber them. Left with no other choice, as he's the lone survivor of the alliance and the planet is crawling with soldiers of OSION, he decides to sneak onto an enemy mothership, leaving the planet, and send a distress signal to one of his ATREA allies in space for rescue.



(Two visual looks of how Major could be imagined – generated with the assistance of Gencraft, source: [5])

6.4 Objectives:

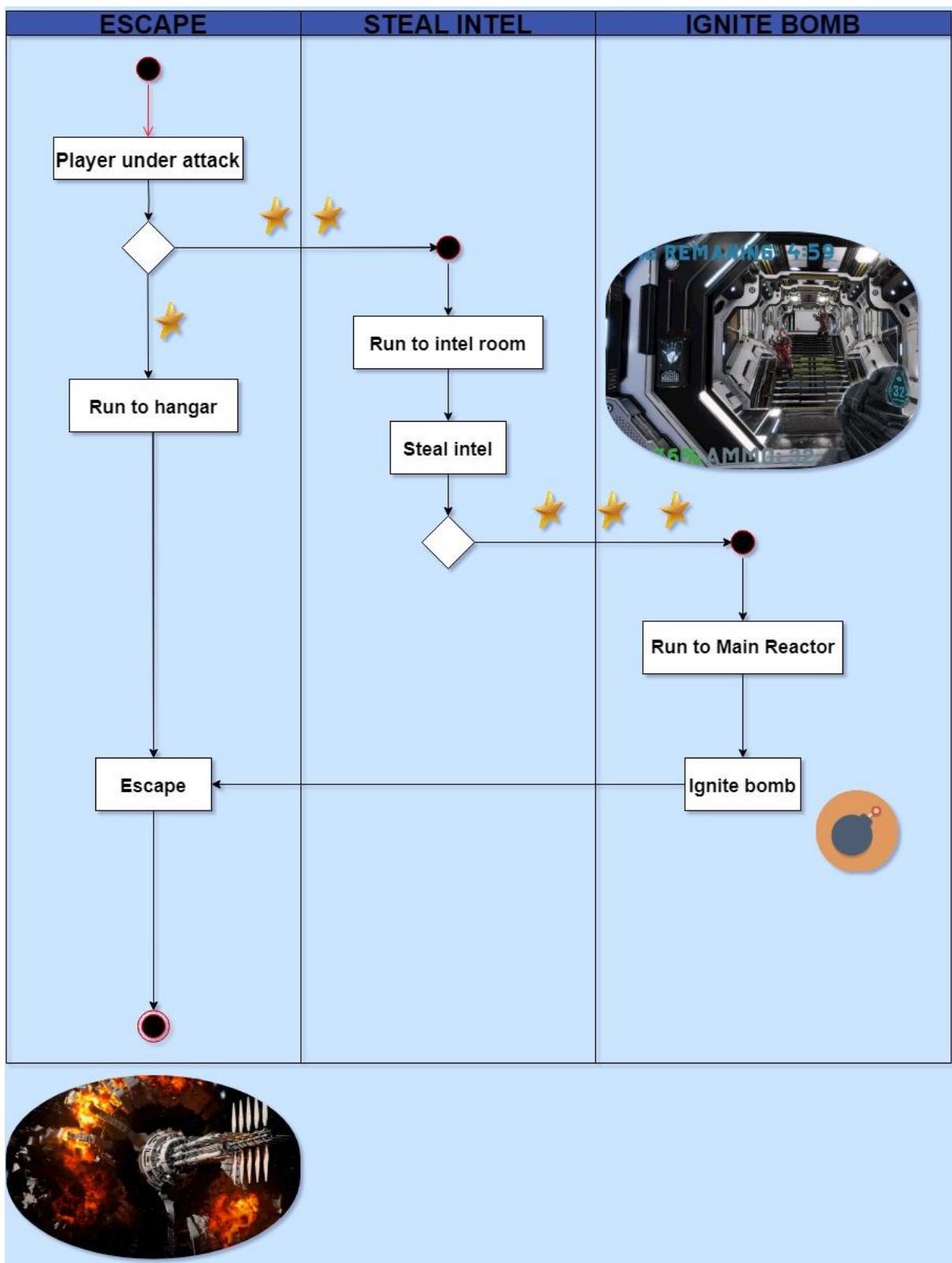
- *For the cursive references in the parentheses check “6.7 Map-layout mockup” figure below.*

The playable story starts when Major (*Yellow dot*) arrives on the OSION mothership/space station – map-layout mockup. You are controlling Major, and you must reach the escape point (*Extraction/Hangar*) for the exfil. On the ship are lots of OSION troops (*red dots*) and you must fight your way out. The only weapons you have on you is your standard assault rifle and pistol, but you can pick up other weapons. Escaping is your main priority, but the ship can be destroyed, and it holds valuable intel that can help the ATREA faction.

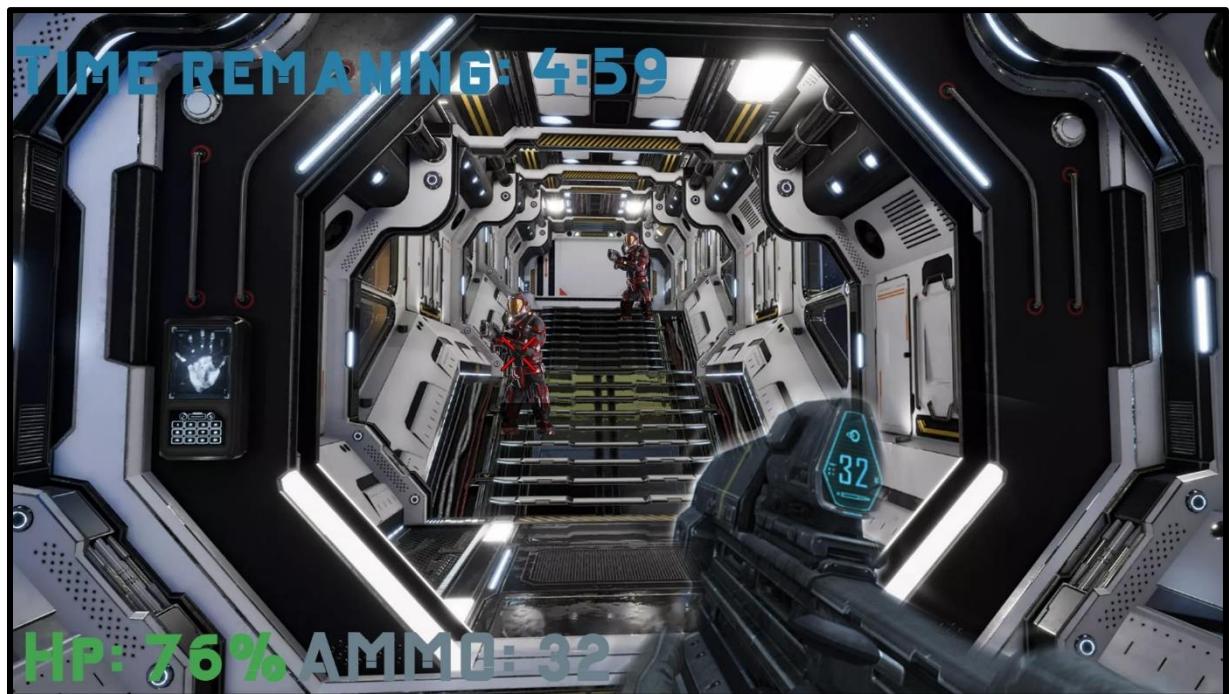
The player will be rewarded based on what he accomplishes during the game. The win condition has a star-based system that tells the player how good he did. The stars vary from one to three stars depending on what the player did. For one star the player must escape. If he achieves this then he has won, but the run could be better. For two stars the player will have to escape and either plant explosives in the *Main-reactor* room or steal intel from the *Intel* room that can help the ATREA fraction. For the perfect run and a three star the player has to do everything. This includes plant explosives, steal intel and escape. If the player dies during the mission it will count as a mission failed and the game will restart from the beginning.

6.5 Activity diagram for win/lose conditions:

- The alternatives (i.e., diamond symbols) can be read as “going for [followed by the number of stars] star(s)”.

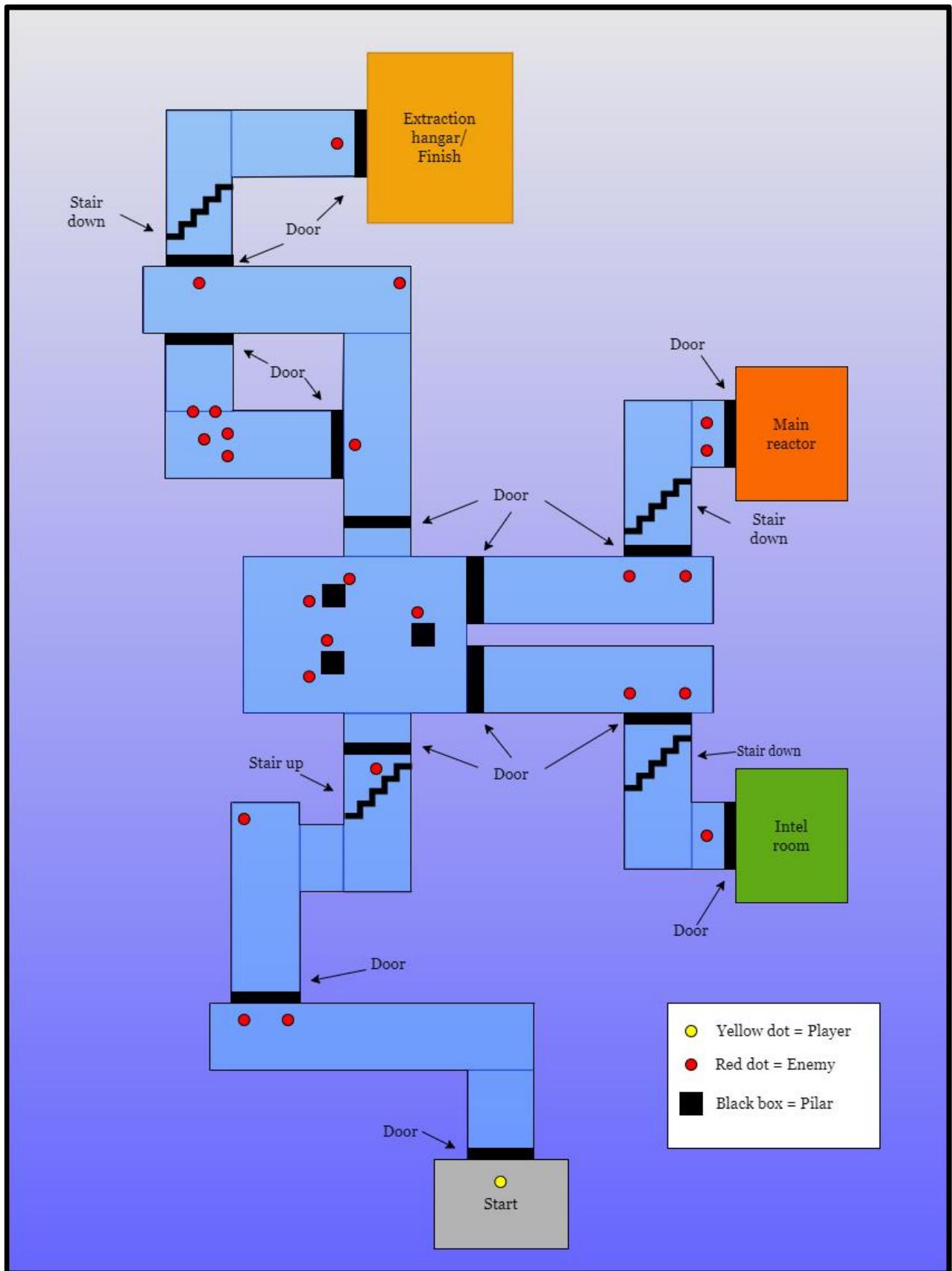


6.6 In-game combat mockup visualization:

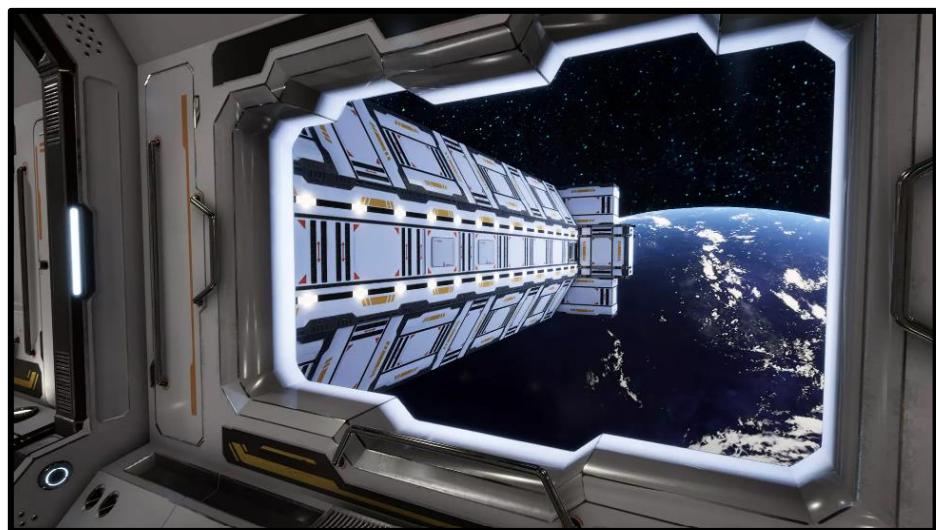
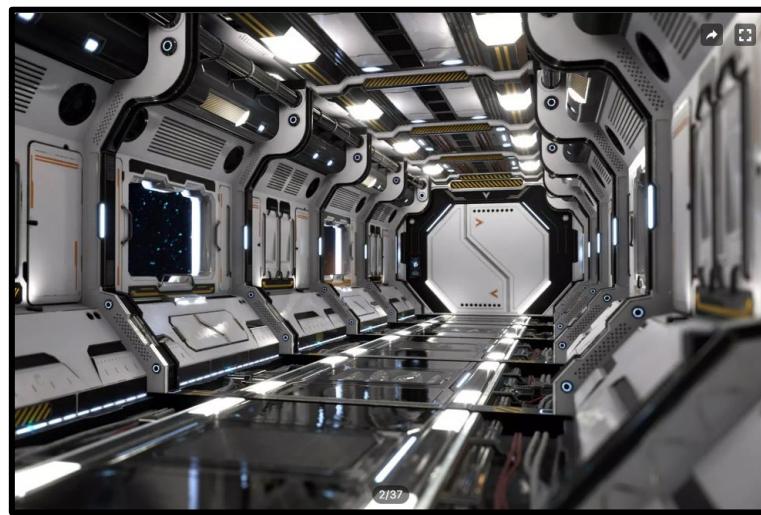


(Environment: source [6])

6.7 Top-down map layout mockup:



The suggested map-layout mockup is based on modular pieces including stairs, doors, corridors and tiles from the following asset, source: [6]:







7 Design history:

As the game itself is not in development yet, I will here talk about what the original design of the game was, and how we altered our approach and design of this game as we went along due to any goals we had to meet, or limitations set by both our knowledge of game development and the amount of time we have.

We were determined quite early to develop a fps game, and we were discussing the possibility of it being a VR. It was not until we realized that to just make a fps game, we would have to be directly compared to AAA titles like Call of Duty and Battlefield, as this is the market benchmark that almost every fps game is compared to. This meant that we would have to make a game that was not only graphically flawless, but extremely polished and well-functioning. As this would be impossible to accomplish, we chose to go the route of VR, which is still quite a new aspect of the fps world, and there is not nearly as many big studio games to be compared to, making the task of creating and selling a game in this genre much easier.

We were quick to decide on a general idea of what we wanted to do in the game, which would be about a character going from A to B without dying with a task to eliminate someone at the end. The game would in this iteration give you the ability to go either stealthy or loud, and the enemy NPCs would act accordingly. However, as we went along and had to take into consideration the difficulty of implementing two different sets of NPC behaviour, how to interact with them, and having to meet tasks given like total playtime, win/ loose conditions and so on we decided to scrap this approach.

We then chose to change the main objective, which now was to stay alive and escape the level. As this might be a little bland and not the most exciting thing ever, we then gave the player two secondary objectives to accomplish, which in turn would reward the player with a star rating depending on how many objectives are completed. However, this would not give a player any sense of weight or urgency to the game. And since the game is supposed to last about 10 minutes, we decided to put a time limit on how long the player can use before the task is failed. To not just make this a pointless game function, we chose to implement the timer as part of the “story”, and we chose that the timer was set to how long a large patrol would use to reach your

part of the level on the spaceship where the game is set, and if you don't make it before that time you would be found and killed.

As mentioned earlier, there are two different side objectives to complete. These are to steal information from the enemy faction, which is located on a terminal in one part of the level, and the other is to blow up the ship by planting a timed explosive to the main reactor. The amount of time to complete these tasks would be set close to what is possible to achieve, making the completion of all three stars seem more meaningful. As the destruction of the ship is done using timed explosives, the player would have to steal the information first if he/she wants to complete all tasks before time runs out and the player is killed. This gives the player the choice to do either one, two or three objectives depending on their skill level and use of time in the level.

8 Development plan:

8.1 Initial work schedule:

Up until October 12th, we have not followed a management system. We have just met every Thursday to work and brainstorm. However, due to our short deadline and many subsystems/functions that have to be integrated and verified to make a cohesive hole, we realized that we had to make changes to make VINCIT ASTRA a success.

8.2 Current work schedule:

Up until October 12th, we have not followed a management system. We have just met every Thursday to work and brainstorm. However, due to our short deadline and many subsystems/functions that have to be integrated and verified to make a cohesive hole, we realized that we had to make changes to make VINCIT ASTRA a success. Due to this team and project being purely software, we opted for a Scrum-like (Scrum and Kanban) approach for our management system. Each sprint is 2,5 weeks (with the exception of Sprint 1 and 4). We used Jira for tracking as it is free and has all the features we need.

Our Scrum sprints will work as follows:

Week	Thursday	Sunday
1	Sprint planning (1hr)	Sync (15 min.)
2	Sync (30min)	Sync (15 min.)
3	Sprint review (1hr)	

Sprint	Duration	Main objective
1	October 12 th – October 26 th	Make GDD
2	November 2 nd – November 19 th	Deploy all assets and program basic controller and NPC movements
3	November 23 rd – December 7 th	Create Alpha
4	December 10 th – December 13 th	Removing potential bugs Game release

9 Implementation details:

To create this game, we are using Unity to implement and program game mechanics. We are using Mixamo and Unity asset store to get everything we need for scenery, weapons and characters. To write the code we use the programming language C-sharp, and our IDE is Visual Studio. For the music and sound effects, we download them from YouTube. YouTube has a wide selection of game sounds that fit our game.

10 Character design:

10.1 Protagonist:

Our game features a soldier of the good legion, “Atrea”, whose experiences on Oscion’s space station unfolds from his point of view using immersive VR technology. Since the game is played using this technology, our protagonist will not have a full character build; instead, the focus will be on incorporating a humanoid hand-design that fits the theme and setting.

10.1.1 Inspirations:



(Source [16])



(Source [17])

10.2 Antagonists:

The game's antagonists are a multitude of enemy soldiers of the evil legion, "Osion". These soldiers are based on a few unique characters, both human and humanoid droids, with varying health and combat difficulty levels. Each human soldier has a helmet to cover their face, to avoid the scenario of encountering and defeating multiple human soldiers with the same facial features. In other words, every soldier with a visible face can be considered a humanoid droid.

10.2.1 Inspirations:



(Source [18])



(Source [19])

11 Sound design:

11.1 Non-combat scenarios:

For non-combat scenarios the background music of our game should consist of calm, but thrilling and mystified “space ambience”, synthetic symphonies or electronica since the player is not currently engaging in combat but racing against the clock.

11.2 Combat scenarios:

For combat scenarios our game should feature epic, up-beat, fast tempo and hard hitting “sci-fi themed” or orchestral soundtracks to substantiate the emotional impact of the visuals.

11.3 Potential additional sounds:

- Footstep sounds when walking and running.
- Short enemy callouts when engaged in combat.
- Reloading sounds.
- Shooting sounds.
- Radio communication speech(es) with ally.
- Explosion sounds.
- Door sliding sounds.
- “Intel achieved” sound.
- Hitmarker sounds.
- Sound when enemy soldier is defeated.
- Sound when the player is getting hit.
- Sound when the player is dying.

12 World design:

Our game world is set within a space station of the Oscion legion, where lights, high contrasts and unique shapes, as well as metallic and robotic materials are utilized to create a futuristic, photorealistic and high-tech environment. The space station should consist of multiple floors and/or various rooms and corridors to establish a good starting point for varied level design and create a more challenging experience for the players. For added immersion and credibility, the space station could also feature glass windows, with views of space and/or planets, galaxies, and meteors.

12.1 Inspirations:



(First two sourced from [6], last four pictures are sourced from [20])

13 Assets needed and pricing:

13.1 Required assets:

Asset	Description	Amount	Example(s)	Pricing in \$
Space station	See description under "World design".	1	 Source [6]	39.99
Unique enemy soldiers	See description under "Character Design - Antagonist".	≥ 3	 Source [19]	14.99
VR hands	See description under "Character Design - Protagonist".	1	 Source [16]	15

Weapons for player	<p>→ Primary and secondary weapon (ex. 1 assault rifle and 1 pistol)</p> <p>→ Futuristic</p>	2	 Source [21]  Source [21]	6
Soundtracks	See description under “Sound Design – non-combat scenarios & combat scenarios.”	>1		0
Additional sounds	See description under “Sound Design – Potential additional sounds.”	>1		0

13.2 Potentially required assets:

Asset	Description	Amount	Example(s)	Pricing in \$
Spaceship for ally	<ul style="list-style-type: none"> → Futuristic → Preferably: Enterable 	1	 <p>Source [22]</p>  <p>Source [22]</p>  <p>Source [23]</p>  <p>Source [23]</p>	0 - 14.99

Explosive	Futuristic or modern looking.	1	 <p>Source [24]</p>  <p>Source [25]</p>	4.99 - 20
Intel	Futuristic or modern looking (ex. downloading using usb flash-drive or stealing hard-drives).	1		10

14 Core game mechanics:

14.1 Movement and combat mechanics:

14.1.1 The player:

The players should be able to walk, run, interact with- and pick-up objects, move the character's hands and otherwise navigate the game-world environment using controllers in standing and/or seated positioning. Additionally, if the play-area allows it, players can also use the controllers and move within a room-scale environment to help reduce the risk of experiencing motion sickness.

While the player is engaged in combat, he/she should experience an accurate and realistic representation of gunplay, including reloading, aiming and recoil, with a varied and fictional enhancement of the muzzle fire.

14.1.2 The enemy soldiers:

The enemy soldiers should be able to hold an idle animation when standing still and walk, run, roll and strafe while both unengaged and engaged in combat. Additionally, they should be able to aim, shoot and reload their weapons while conducting the basic movements: strafing, walking and running. To facilitate both success and challenge for the player in combat, the soldiers should also have basic enemy AI (Artificial intelligence) reactions to the player, along with varying health amounts, shooting frequencies and accuracy levels. For simplicity, we are also thinking about having the enemy soldiers in the same room or corridor as the player engage with the player exclusively, unless the player opens another door, in which case the soldiers in that new area will also attack.

Other features can include a diverse set of death animations, that corresponds to where the last bullet damage has been taken, to enhance the game's realism and credibility. It's preferred that every animation needed for the enemy soldiers is also included in the asset downloads.

14.2 Progression mechanics:

14.2.1 Star system:

When the player starts the game, he/she can choose whether to go for the 1/3-, 2/3- or 3/3-star completion. The difficulty and challenges the player must accomplish increases accordingly:

- ➔ To earn one star, all the player has to do is escape the space-station with the allied space-ship.
- ➔ To earn two stars, the player must escape the space-station with the allied space-ship, while having accomplished one of the following two objectives: acquire valuable intel of the enemy fraction or causing the space station to explode.
- ➔ To earn three stars, the player must escape the space-station with the allied space-ship, while having accomplished both of the following two objectives: acquire valuable intel of the enemy fraction and causing the space station to explode.

14.2.2 Time pressure:

While playing, the player will experience time-pressure regardless of the chosen star completion level. This introduces an additional level of challenge, as failing to reach the friendly space-ship within the time limit will hypothetically result in an enemy patrol destroying the allied space-ship and killing both you and your pilot.

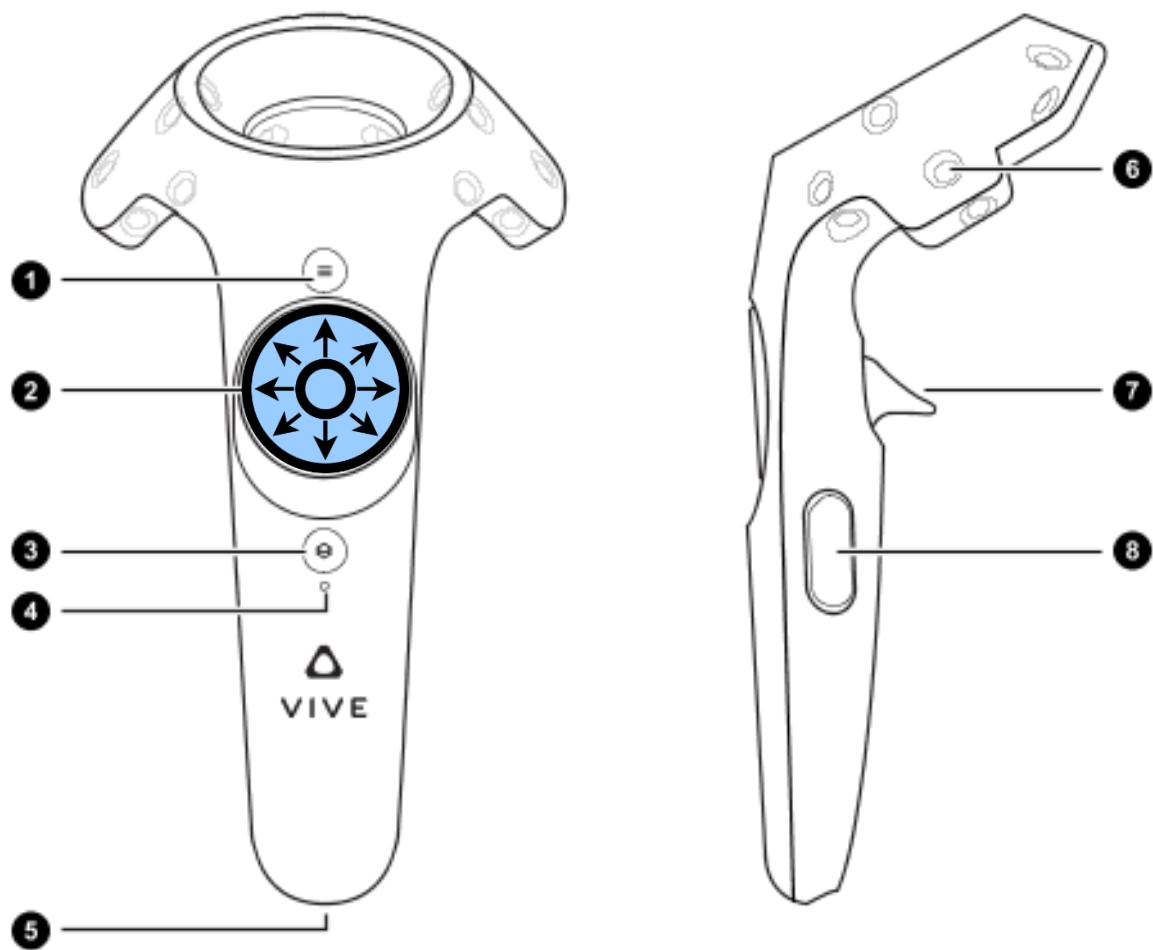
14.2.3 Checkpoint:

After reaching a midway-point, which varies depending on the chosen star completion level, an appropriate checkpoint will be established. This checkpoint allows the player to respawn should he/she die during latter half of the game. The player should also respawn with more time left than they had when they initially reached the midpoint before they died. This allows for an easier completion if the player is struggling.

15 User Interactivity (UI):

Due to the fact that we primarily have access to a HTC VIVE VR kit during the development process, this section of the document is solely based on the button layout of the HTC VIVE controller and expected visuals from the VIVE headset.

15.1 Button layout:

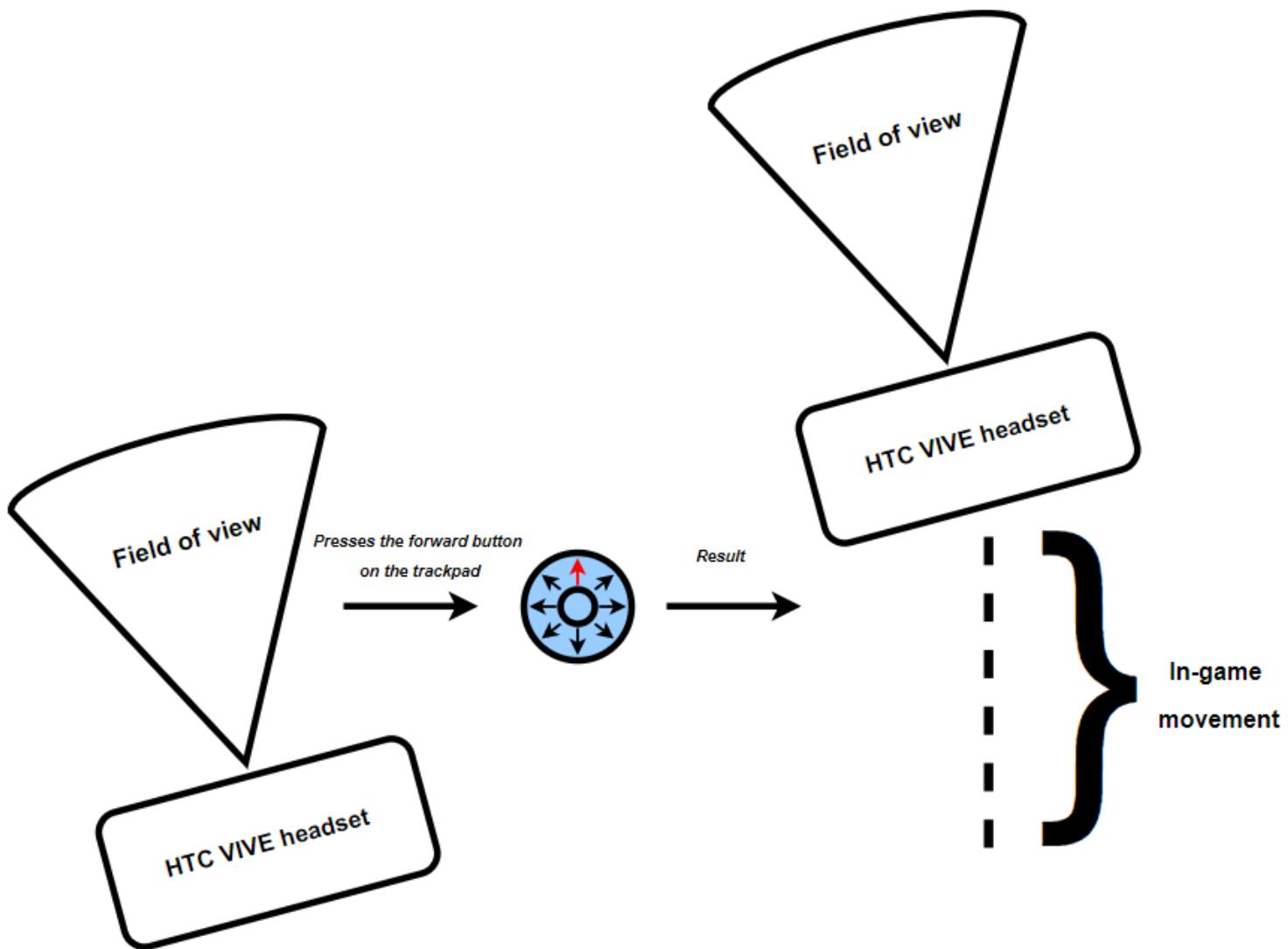


(Source [26])

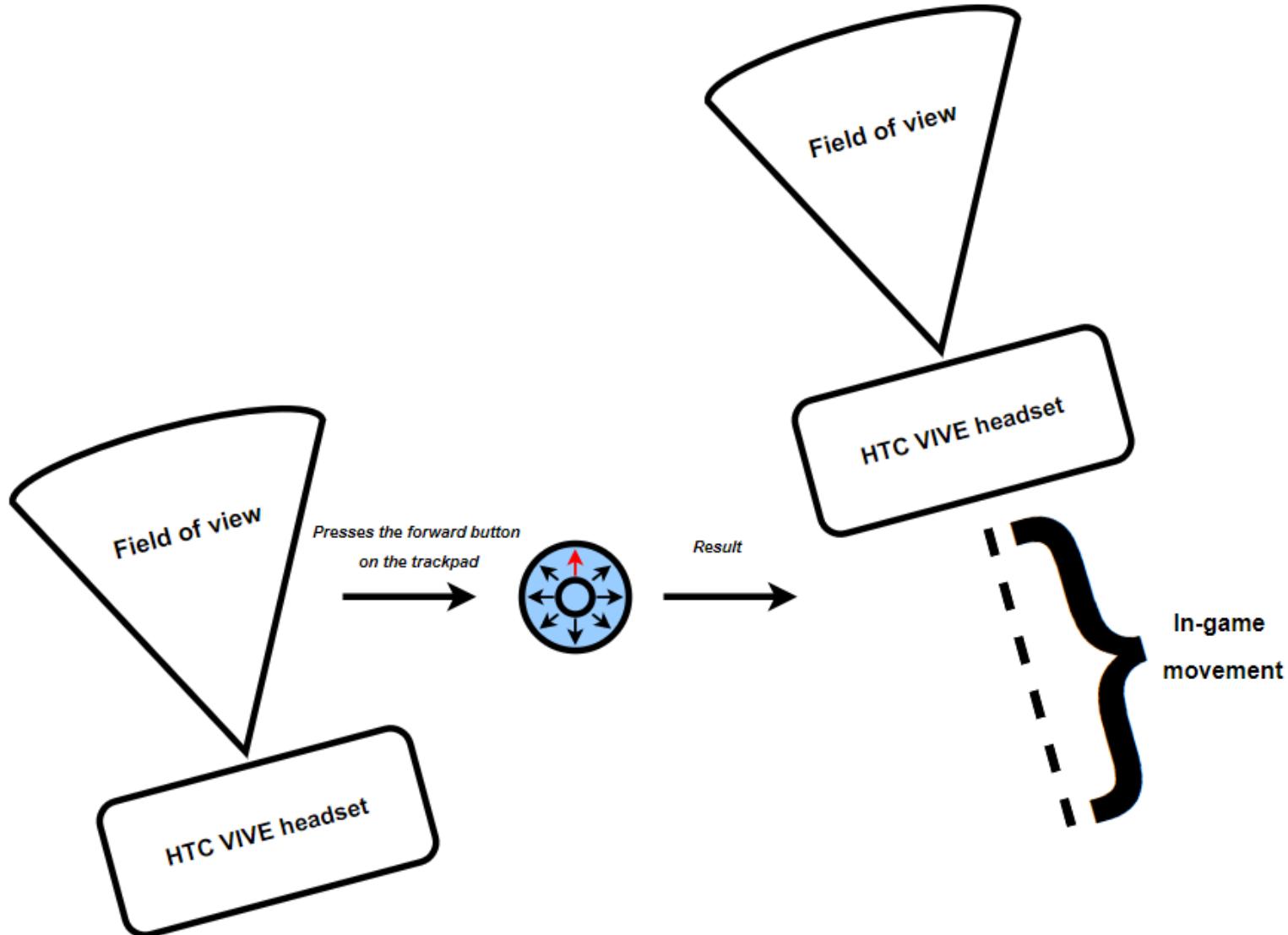
Number	Type	Functionality
1	Menu button	Press to open or close inventory menu.
2	Trackpad	<p>Movement:</p> <ul style="list-style-type: none"> ➔ Place your thumb in the direction you want to walk. ➔ Place and press in the direction you want to run. <p>Selection in menus:</p> <ul style="list-style-type: none"> ➔ Press in the direction you want to scroll (limited to horizontal & vertical) ➔ Press in the middle to select.
3	System button	Press to pause the game.
4	Status light	Showcases controller status (ex. Connectivity- or battery status).
5	Micro-USB port	Port used for charging.
6	Tracking sensor	Tracks hand positioning in the virtual world.
7	Trigger	<ul style="list-style-type: none"> ➔ Press for single shot (applies to secondary- & primary weapon). ➔ Press and hold for full auto (applies to primary weapon).
8	Grip button	<ul style="list-style-type: none"> ➔ Press and hold to grab and hold objects. ➔ Release to let go of objects.

15.2 Headset orientation- and movement alternatives:

1. The player uses the standardized button settings for the trackpad mentioned in the table above. These are independent of where the player is looking, so it's up to him/her to look where he/she is going. See the figure below for a visualization of how it could look like if the person didn't adjust his or hers point of view.



2. The button settings for the trackpad are determined by the direction the player is looking. In other words, when the player touches or presses any direction on the trackpad, their character will walk or run in the same direction that aligns with their point of view. See the figure below for a visualization of how this could look like.



15.3 Menu alternatives:

15.3.1 Main menu:

When first launching the game, the player could be presented with a main menu where they can choose to play the game, check leaderboard, check settings (ex. button settings) or quit the game entirely.

15.3.1.1 Mockup menu:

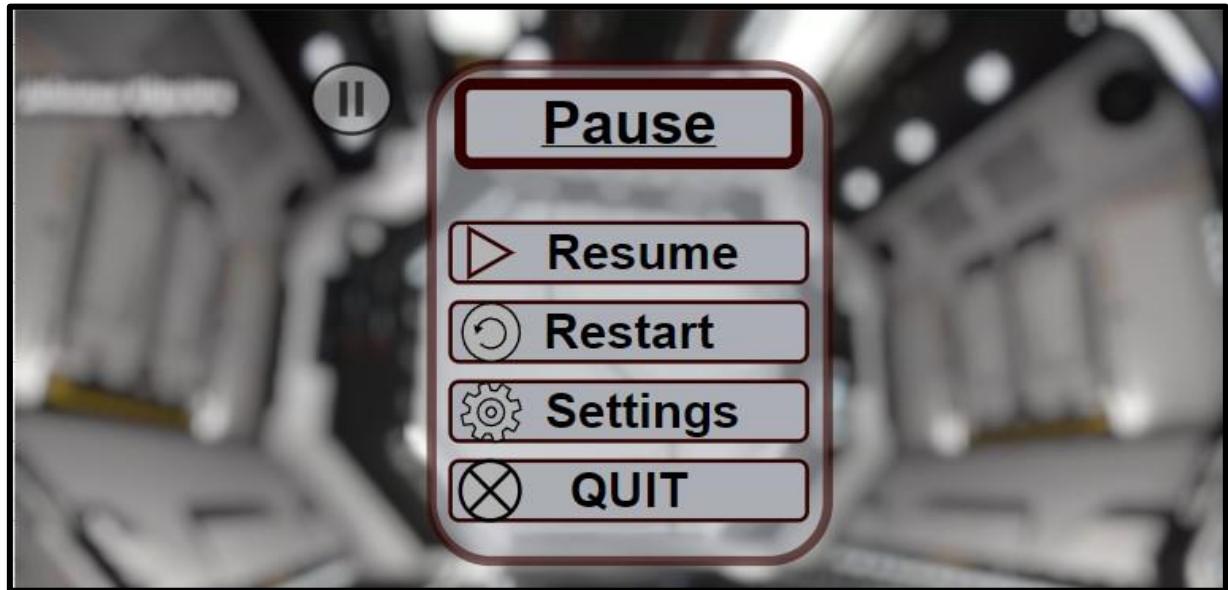


(Background logo: source [8])

15.3.2 Pause game menu:

At all times during gameplay, the player has the possibility to pause the game, restart from last checkpoint (if possible), check setting or quit to main menu.

15.3.2.1 Mockup menu:



(Background: Source [6])

15.3.3 End game statistics:

After a successful completion the player will be prompted with their completion time and the number of stars achieved. This is a way to highlight the player's performance, and showcase increased player progression. The player will also have an option to play again with the set star-level, check leaderboard or quit to main-menu. Should he/she die in combat or by not escaping the space-station within the timed explosion or within the set time frame, the player would be prompted by a "mission failed" menu. Referring to the leaderboard, it is also worth mentioning that the number of stars is prioritized before the completion time in ranking competitors.

15.3.3.1 Mockup menus:



(Background explosion: source [9])



(Background: source [6])



(Background: source[6])

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