Indice

T3R gamedev development team

Rosario Crisci: team leader and server programmer

Rocco Dereviziis: GUI programmer and 3D animator

Riccardo Stucchi: Client and gameplay programmer

Giovanni Spina: Art director and 2D graphic designer

Luca Leoni, **Mattia Lazzari:** 3D Artist

Simone Corsaro: Sound designer

The concept and the design of Nivram League Warrior are a collaborative effort of Rosario Crisci, Rocco Dereviziis and Riccardo Stucchi

1. Design History

27.03.2012: First draft of the document

30.03.2012: Creation of the online wiki of the project

04.04.2012: System Requirements inserted

05.04.2012: Technical aspect added

10.04.2012: Legal Analysis inserted

12.04.2012: Wireframes inserted

16.04.2012: Gameplay section added

15.04.2012: Formalization of the wiki content in this document

18.04.2012: Storyboard added

14.06.2012: Effort and costs estimate, Server System requirements

15.06.2012: Document revised and edited. System Requirement updated. Added "focus on corporation"

17.06.2012: Updated chapter 5 and some other details

2. Vision Statement

The game takes place in the quadrant A7-9D, called Adam, in a far future.

Adam is ruled by the President of Neftali council, the EV. The balance between the worlds of Adam is about to break and there is an ongoing cold war that is fought on the arenas of the Nivram League: the association of the Co.R pilots collects fighters all over the Adam's systems and makes them fight into their arenas giving them a chance to earn money.

The Co.Rs are the remote controlled gladiators and the Co.R pilots are their guides and assemblers.

To join the Nirvam League and to fight as a Co.R pilot, the player has to choose one of the races that populate Adam and a class, representing his specialization as Co.R pilot.

The Co.R pilots lust for glory and money. They need money in order to buy new mechanical parts for their Co.R, new weapons and new devices to assemble a winning Co.R.. Accessing to the technology of a corporation is the key to have great victory inside the arenas!

The corporations are powerful alliances between Co.R. Pilots and can provide great benefits to them. Winning for a corporation is more remunerative than winning for the player's self and this produces points that, once a week, the player's corporations can use to improve their technologies.

The players can choose the arena they prefer: Nirvam League Warriors provides different PvP modalities such as the innovative maze-mode, where the Co.R pilots team is called to find the ever-changing exit from a random generated, dark, maze!

2.1 Game logline

Warning: Pure Steal Brutality, watch your back! All your skills and your tactics are needed to win in the Nivram League! Are you prepared?

2.2 Gameplay Synopsis

Nivram League Warriors focuses the player's attention on Co.R customization and fight.

Everything is depicted in a fancy way that could seems, sometimes, decadent. Almost everything should looks hand-drawn in order to let the player's imagination free to invent the missing details. Nirvam League Warriors paints a fantastic world: player's fancy has to be the game core.

The player takes the role of a Co.R. pilot, creating his own alter-ego choosing a race among those inhabiting Adam. Once the race is chosen, is up to the player decide how his Co.R. will function from the point of view of mechanical aspects: he has to choose one of the three starting classes: Mechanic, Engineer and Scientist. Each class provides a set of knowledges to exploit the assembling of the Co.Rs.

The Mechanic will build robust and slow robots, the Engineer instead will set up agile and smart robots. The Scientist can build robot based on extreme technology, taking advantage from the energy management of the Co.R.

The adventure begins when the player has chosen his avatar and, related to his choices, he will start the game from a different location. A human scientist will begin from a laboratory on a human colony or a mechanic will start the game from a workshop.

The player will be guided through the world from a series of introductive quests in order to make understandable the whole game mechanics. At the very beginning the player shouldn't know anything about the on-line features of the game. He has to feel like if he's playing off line. Gradually every feature of the game will be revealed.

Once the player ends the tutorial he will be able to build his first Co.R. Each player can have only one Co.R. At this point another choice has to be taken: what combat style will the player Co.R. perform?

The Co.R. could be a Tank, using melee weapon and heavy armor or it could be a Wrecker that loves explosions and missiles weapons! The combat specialization a Co.R. has, is called over-class.

Choosing the over-class will be a task that requires great care, indeed, in order to change the over-class the player must pay a lot of money.

From this moment on, the player is active part of the Nirvam League Warriors world. From now he can fight in the arenas, looking for a corporation to join or founding his own.

There could be different types of players and so, different types of Co.R. pilots.

There could be the Co.R pilot that loves the 1vs1 competition or could exist the pilot that is not comfortable with direct competition and prefers to fight in teams. Another kind of pilot could be the one that doesn't really love to destroy everything and needs a more "intellectual" challenge.

Nivram League Warriors provides them different game modalities. The League's arenas are located in different planets, each of them, has a different population that loves different competitive modalities. Some races love the 1vs1 or team vs team encounters, some other, instead, loves game modes like capturing the flag. Some Adam's inhabitants like to defend control points from the attackers and some other exploit their mystical, subterranean labyrinths in order to create crazy and challenging game modality called "maze-mode".

The victory on the various arenas provides the player rewards such as money, electronic components (referring to which kind of Co.R the player has defeated), and sometimes other stuff. The Nivram League also keeps a ladder that a player can dominate increasing his rank.

The gambling lovers can bet over the Co.R. fights and the League simplifies this by keeping the quotations of all Co.R pilots.

There are a lot of ways to gain money and fame in Adam. Someone thinks that fighting could be the only way, but playing Nivram League Warriors will let understand to the players that Co.R. fights aren't the only remunerative tasks!

3. Audience, Platform, and Marketing

3.1 Target Audience

This game is designed for people who like MMO, a little bit of strategy, a lot of customization, hard teamwork and team competition.

People who like fighting and proving they are the best can find a very good challenge in arenas competitions.

Adam is a good place to meet friends and play with them. Social aspects are improved by corporations. These are the best places to enjoy the various aspects of the game: as a corporate the player can chat with his corporation friends, can explore and exploit the market in order to develop the corporation's influence in the global market and also gain money to improve his arsenal.

Achievers can satisfy their thirst of glory with NLW achievement system. In this way, Nivram League Warriors provides different challenges for different kind of players.

Since violence and gambling are both present in NLW we expect to obtain a 18+ PEGI rating.

3.2 Platform

NLW can be run on PC and MAC. This design choice was made because the game mechanics require the immediacy of mouse, a lot of buttons for the various abilities of the Co.R. and the convenience of the keyboard for chat.
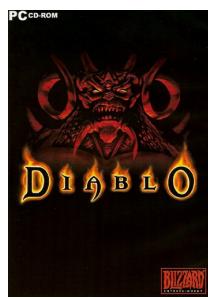
3.3 System requirements

NLW will be massively multiplayer so it needs a medium-power computer to be played. The development choices have been made in order to allow as many people as possible to play.

Minimum system requirements for client:

- **O/S:** Windows XP or later; Mac OS X 10.5 or later
- **CPU:** 1.5 GHz P4 (single core) processor or equivalent. Intel processor is needed for Mac OSX
- **RAM:** 1GB or more
- **VIDEO CARD:** Graphics card with 256 MB of VRAM and pixel shaders.
- **HD:** ~ 10GB free space
- **MONITOR:** resoultion 800x600
- **CONNECTION:** Low latency Internet connection
- **INPUT:** Keyboard/mouse

3.4 Top performers

Title: Diablo

Release Date: December 31, 1996

Platform: Microsoft Windows, Mac OS, PlayStation

Sequels: Diablo: Hellfire, Diablo 2, Diablo 3

Description: Diablo is a dark fantasy/horror-themed action role-playing game developed by Blizzard. In the game the player takes control of a lone hero battling to rid the world of Diablo.
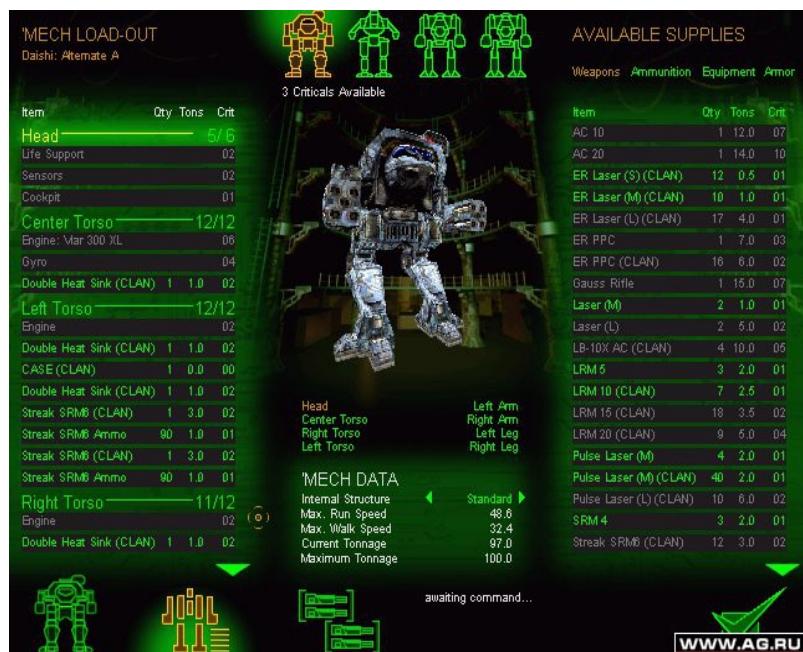
Title: MechWarrior
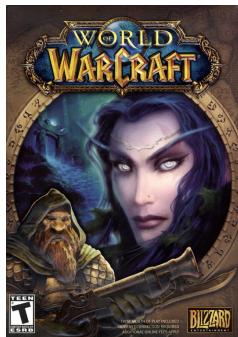
**Release Date:** 1989

Platform: MS-DOS, Super Nintendo

Sequels: MechWarrior 2, MechWarrior 3, MechWarrior 4, MechWarrior Online

Description: MechWarrior was the first video game to offer the player a chance to pretend to pilot a BattleMech from the view of a pilot. With this game the player has a great deal of freedom which include choosing missions, buying & selling Mechsand parts.

Title: World of Warcraft
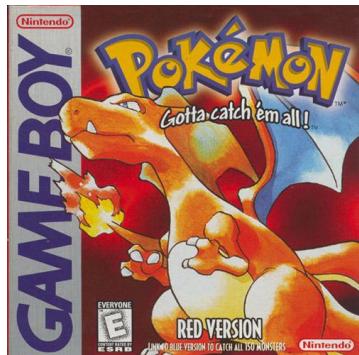
Release Date: November 23, 2003

Platform: Microsoft Windows, Mac OS

Sequels: The Burning Crusade, Wrath of the Lich King, Cataclysm, Mists of Pandaria

Description: World of Warcraft is a MMORPG by Blizzard. With 10.2 million subscribers as of December 2011, World of Warcraft is currently the world's most-subscribed MMORPG, and holds the Guiness World Record for the most popular MMORPG by subscribers.


Title: Pokemon

Release Date: 1996

Platform: Nintendo consolles

Sequels: Pokemon series

Description: The original Pokémon games were role-playing games (RPGs) with an element of strategy

3.5 Feature comparison

T3R games dev took inspiration from all games in the above list. All those games are forerunner or revolutionary for their genre.

The simple combat and movement system, the randomized dungeon creation and the incredible item generation system are all key features we loved of Diablo; the highest level of Mecha Customization and the idea of fire-gropus in MechWarrior; the Guild System and Talent Tree from World of Warcraft; the combat pet idea and something from the combat system in Pokemon. The "Maze-mode" and the guild technology tree is unmatched, we want to attract the attention of players with these element of innovation. Otherwise our game is not intended to be only "another game of robots".

4. Legal Analysis

In order to develop Nivram League Warriors T3R game dev will use only 3D models, graphics, sound and musics developed by external collaborators or under creative common license.

The attribution constraint is respected. This document provides a media list (see chapter 9) where all the authors and the sources for third part materials are expressed.

All the software used for prototype development is under free license, student license or non commercial license.

Software licensed in the way previously described are subject to restriction so, in order to develop the full project, specific softwares and protocols have to be produced.

5. Gameplay

5.1 Overview

The essence of the game is fighting for glory and/or money. In order to obtain that, the player has to build a Co.R. and make it fight in the arenas.

The two main aspects of the game are:
- **Travel mode:** Exploring Adam worlds in order to search different vendors who sell you mechanical parts and weapons. In every planet the player can find a workbench where he can build or modify his own Co.R.. Furthermore, it is possible to buy/sell items in the global market through the corporation's stations. Exploring different places gives the player the possibility to access different kind of arena competitions and to find many other players with whom to relate.
- **Combat mode:** Entering one of the various arenas, the player has to pilot his Co.R. in order to make it fight against one or more opponents. There are different ways to win a competition that depend on what kind of arena the player has joined.

5.2 Gameplay description

Travel mode

When a player begins to play Nivram League Warriors, he starts in Travel mode. In this mode the camera is above and behind the character: third person camera.

The player can move his character all around the planet zone where he is located.

In order to visit other locations on the same planet or to visit other planets the player has to use the Adam transport system.

In a planet zone (a city, a village, or a different location) the player can interact with NPCs. The most important NPCs are vendors or event managers.

Vendors sell and buy mechanical parts, weapons, chips (which provide Co.R. abilities) and their upgrades. Mechanical parts and weapons vendors change their inventory generating new items with semi-randomized parameters every N minutes.

Event managers give the player access to the available competition in their location (the arena of the planet). Some event managers give the player the possibility of betting on the matches.

In some locations the player can find the workbench: a place where he can build or modify his own Co.R. Here the player can choose what items and what ability his Co.R. has to use during the fights.

In Travel mode the player can also develop his class and overclass skills using the points gained levelling. Moreover the player can decide to travel to his corporation's base or establish a new corporation if he wants.

In order to found a new corporation the player has to interact with a special NPC located in the "Corporation Register". A player that founds a corporation becomes a Corporation Master; in this way he can manage and expand it.

Managing a corporation means:
- deciding what kind of research tree developing
- buying objects for your corporation's headquarter (HQ) in order to add feature like bank, daily quest wall, a special workbench that allows the corporates to craft items from the tech tree with some component gained winning arena competitions.
- giving the corporate some special permissions in order to access to different features like bank managing, extra chat channels or using the special workbench.

As a corporate, the player can use the corporation HQ to access to his own safe deposit and the global market and to the daily quest wall if the corporation has it. By gaining some special permissions the player can also deposit and withdraw items from the corporation bank, crafting special items, adding or removing members from the corporation and organize some special corporation event.

Combat mode

In combat mode the player commands directly his Co.R.. The camera is set above the Co.R. and the player can choose to enlarge the field of view zooming out. In order to make the Co.R. fight strategically, the player has to think at the best trajectory his Co.R. must follow. Once the Co.R. is on route, the pilot needs to choose carefully the abilities to use in order to defeat the opponent. The Co.R. aims at the enemy rotating his torso and by using his energy it can score the winning shots to penetrate enemy defense and overcome him.

Once the player's Co.R. has defeated the opponent's one the player gains some rewards:
- experience (experience is gained also by the loser but in less quantity)
- rarely a semi-random generated weapon or mechanical part
- money
- some components used to craft items at the corporation's HQ. (the components depend on the overclass of the opponent's Co.R.)

Furthermore, the player has the opportunity to increase its rank winning more and more competitions.

Gaining experience means the player has the opportunity to leveling up during an encounter. Even if the level of the player grows he cannot upgrade abilities and skills until the end of the competition.

Focus on corporations

A corporation is a Co.R. pilots alliance that has the goal to put together players with something in common like the will to win or the will to stay well together. Corporations have their headquarters in orbital stations. Each corporation has its own base where a Co.R. pilot can find a corporation bank, various NPCs and his own deposit. Players can access Adam's market only through their corporation's orbital station.

Another good motivation to join a corporation is the fact that each corporation can develop one of the three technologies trees Nivram League Warriors provides at the moment a corporation is found.

When a player decides to create his own corporation, indeed, he needs other 9 Co.R. pilots that share this will. Once these ten players agree to create an alliance they have to go to an office, the corporations Register, to communicate that they want to found a corporation so that the the Register's employes make them choose a technology tree the players want to develop. They can choose from satellitar tech, flux tech and nano tech.

Weekly, based on how well the Co.R pilots have fought, the corporation earns points expendable to improve the selected tech tree.

5.3 Controls

The controls are different depending on what game mode the player is playing:

1.   If the player is on the planet and moves the avatar (Travel Mode)
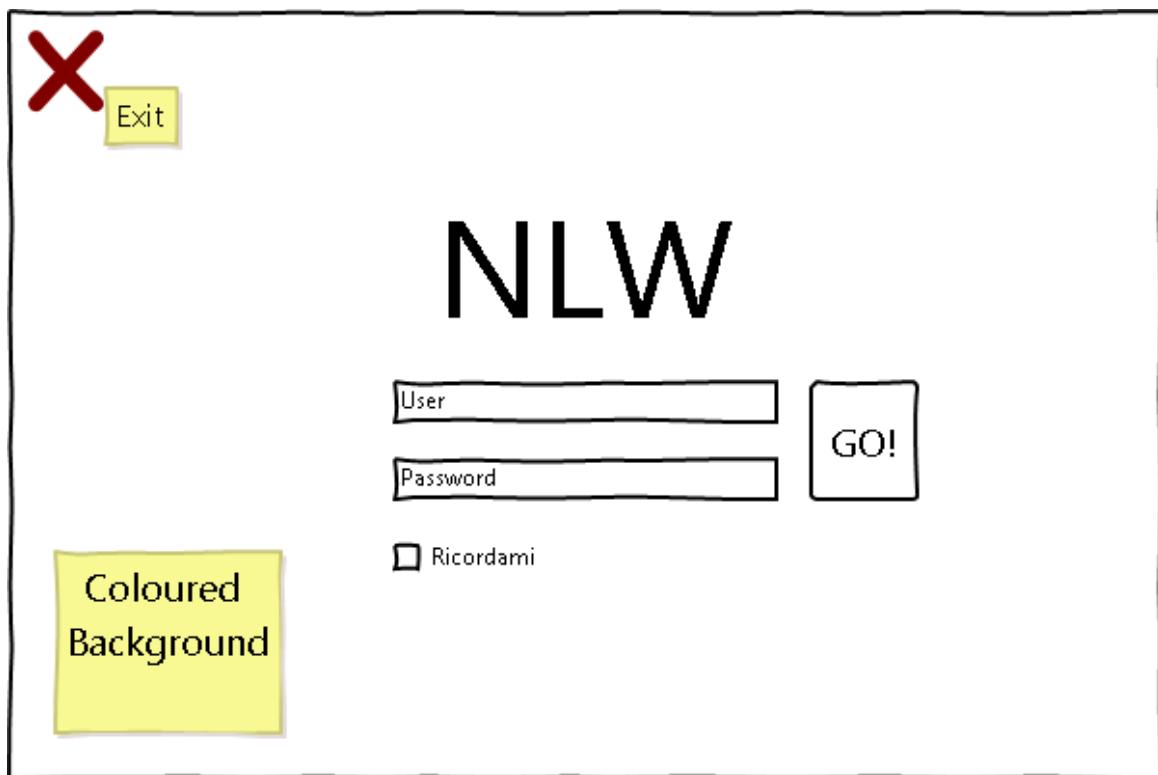
Key	Action (*Travel Mode*)
Mouse Left Click	Move the player's avatar in the world
Mouse Right Click + Mouse Axes Movement	Rotate the camera behind the avatar
E	Interact with npc
Mouse Wheel	Camera zoom in/out
Esc	Show the Game Menu
Enter	Enter/Exit chat window

2.   If the player is in the arena (so the controls are related to the Co.R.) (Combat Mode):
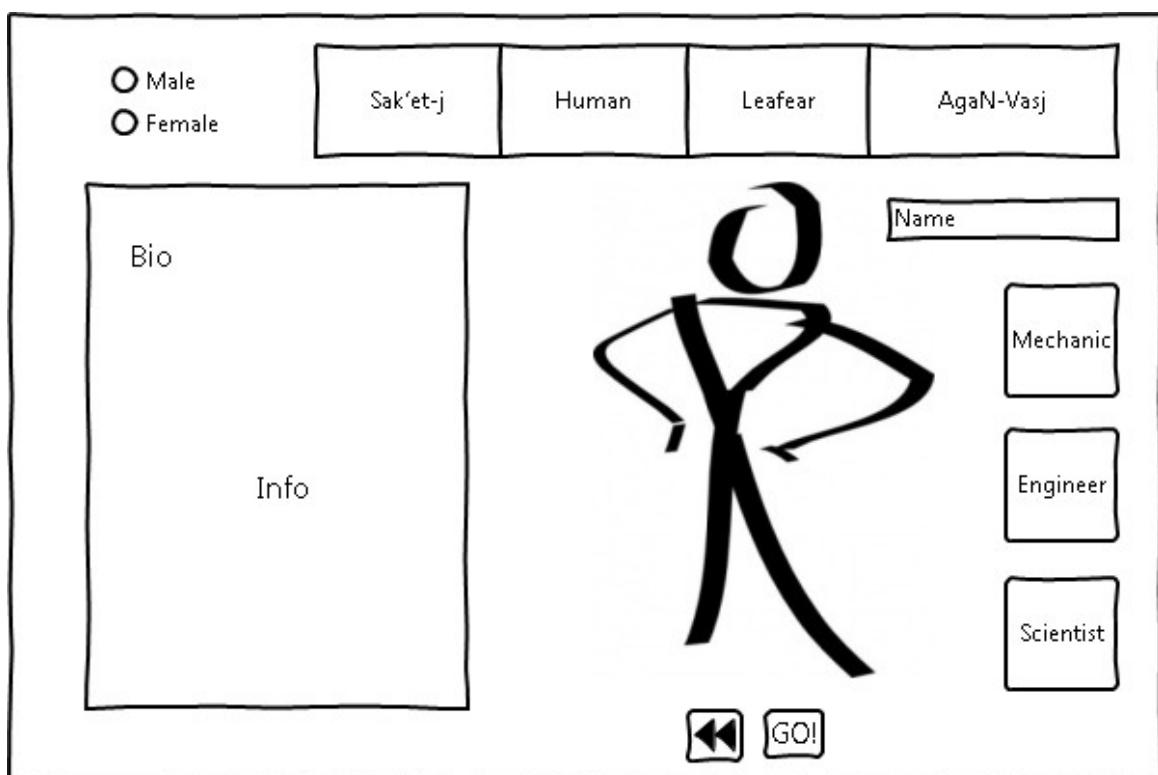
| Key	Action (*Combat Mode*)
Mouse Left Click + Mouse Axes Movement	Descibe the trajectory that the Co.R. will follow
Mouse Right Click	The body of the Co.R. will rotate up to reach the position of the body that look at the appointed point
W	1st fire group shoots
A	2nd fire group shoots
S	3rd fire group shoots
D	4th fire group shoots
Keyboard Number 1, 2, 3, .., 0	Use overclass abilities
Mouse Wheel	Camera zoom in/out
Esc	Show the Game Menu
Enter	Enter/Exit chat window

5.4 Interfaces
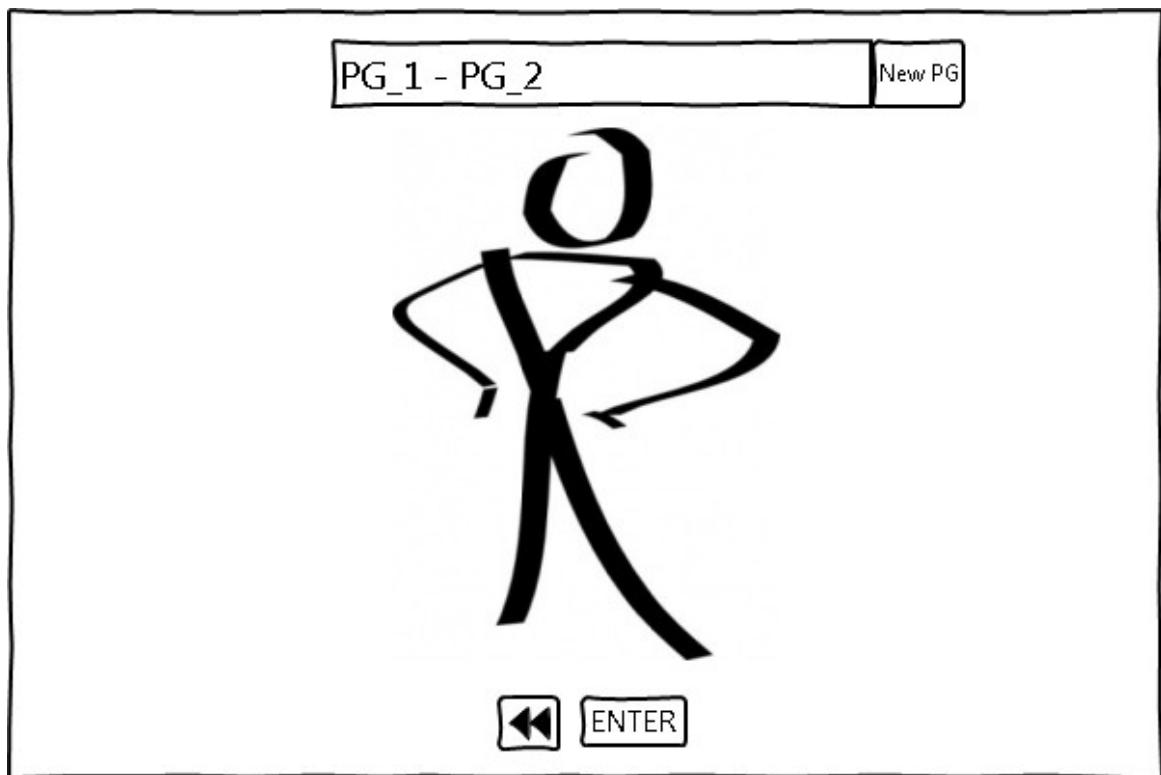
Login screen
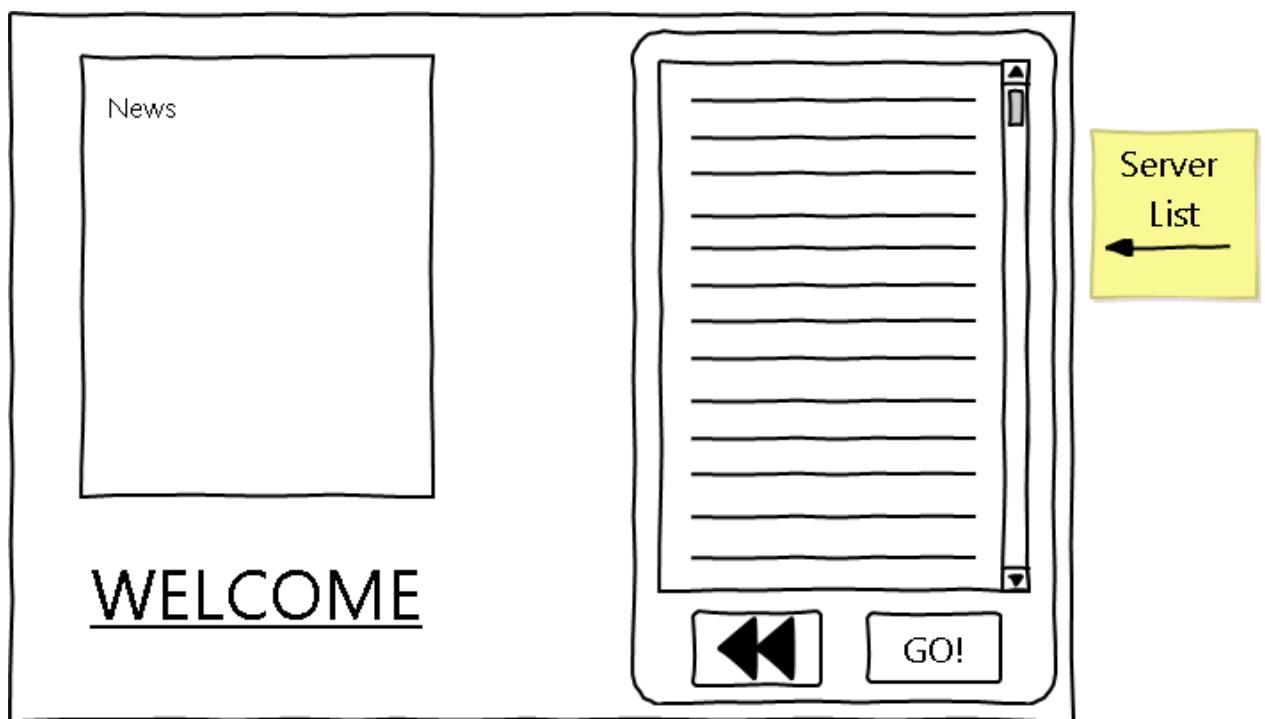
New character creation screen
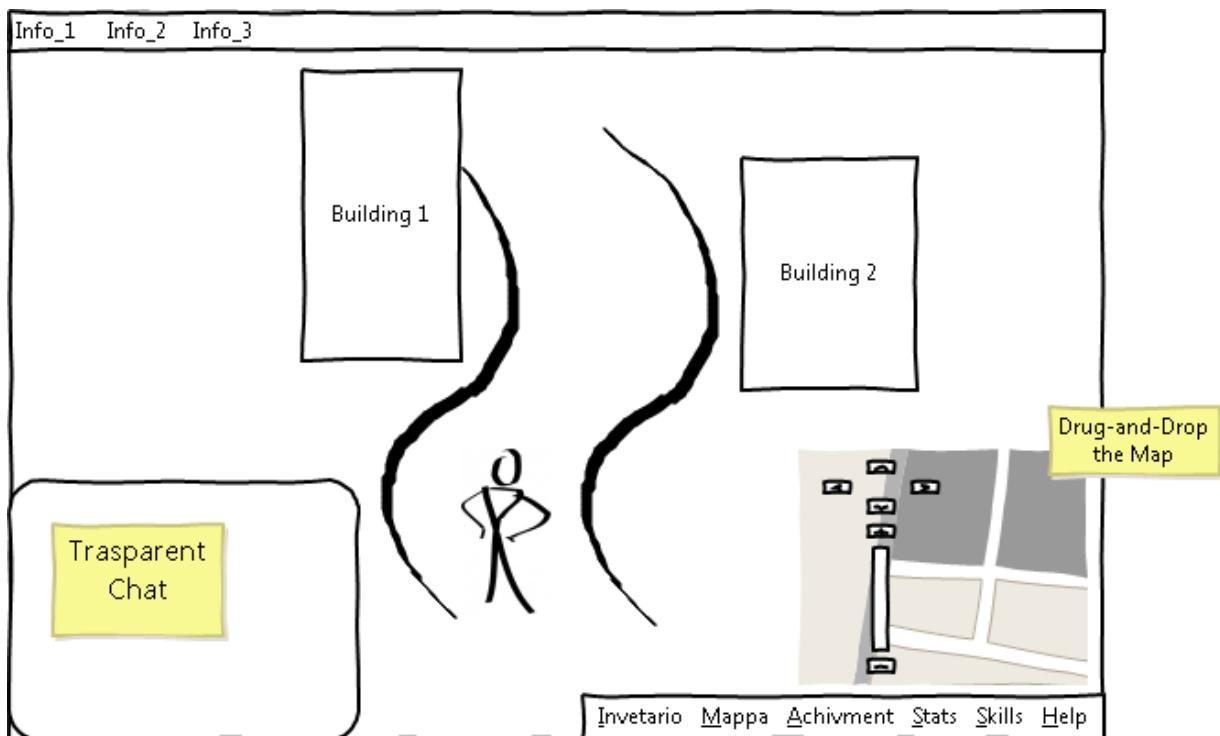
Character selection Screen

PG_1 - PG_2 | New PG

◀◀ ENTER

Server Selection Screen

News

WELCOME

Server List ◀

◀◀ GO!

Travel Mode Screen

Info_1   Info_2   Info_3

Building 1

Building 2

Drug-and-Drop the Map

Trasparent Chat

Invetario   Mappa   Achivment   Stats   Skills   Help

Combat mode Screen

Cooldown

Fire-group - Cooldown - Weapon

Team-mate indicates Health, Energy and Name of Team members

Transparent Chat

| W |
| A | | D |
| S |

These 4 squares represent the Fire-groups

| 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 0 |
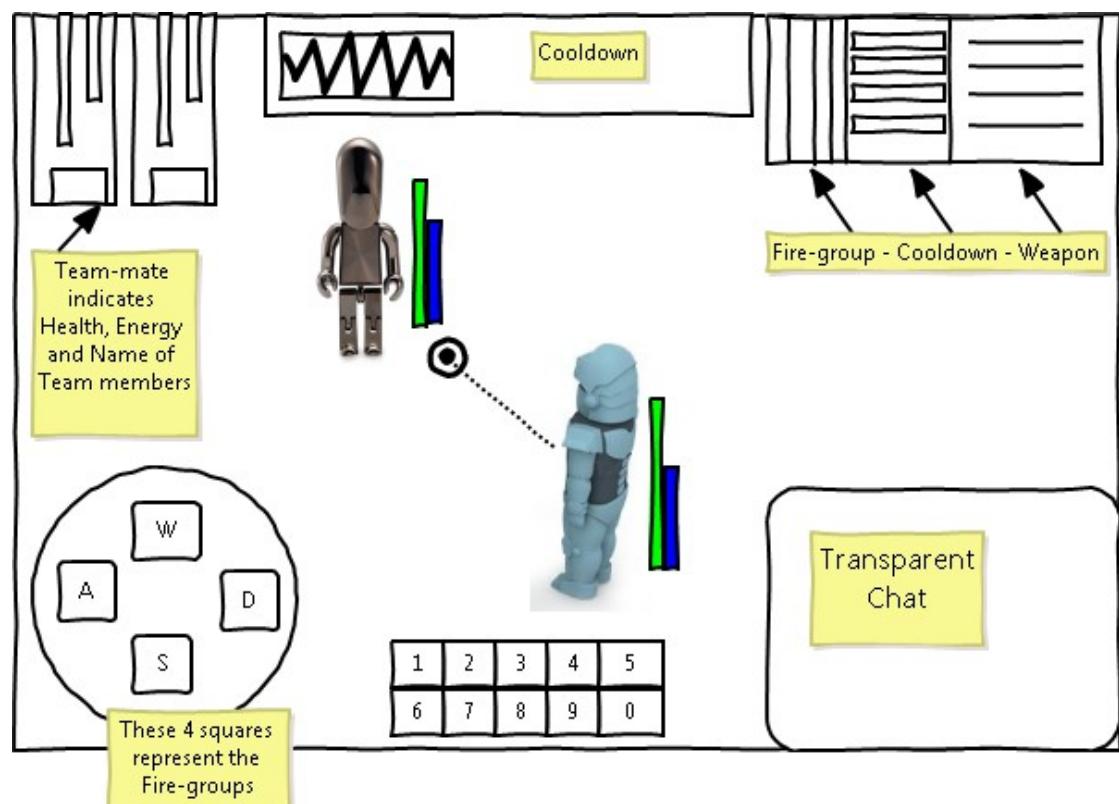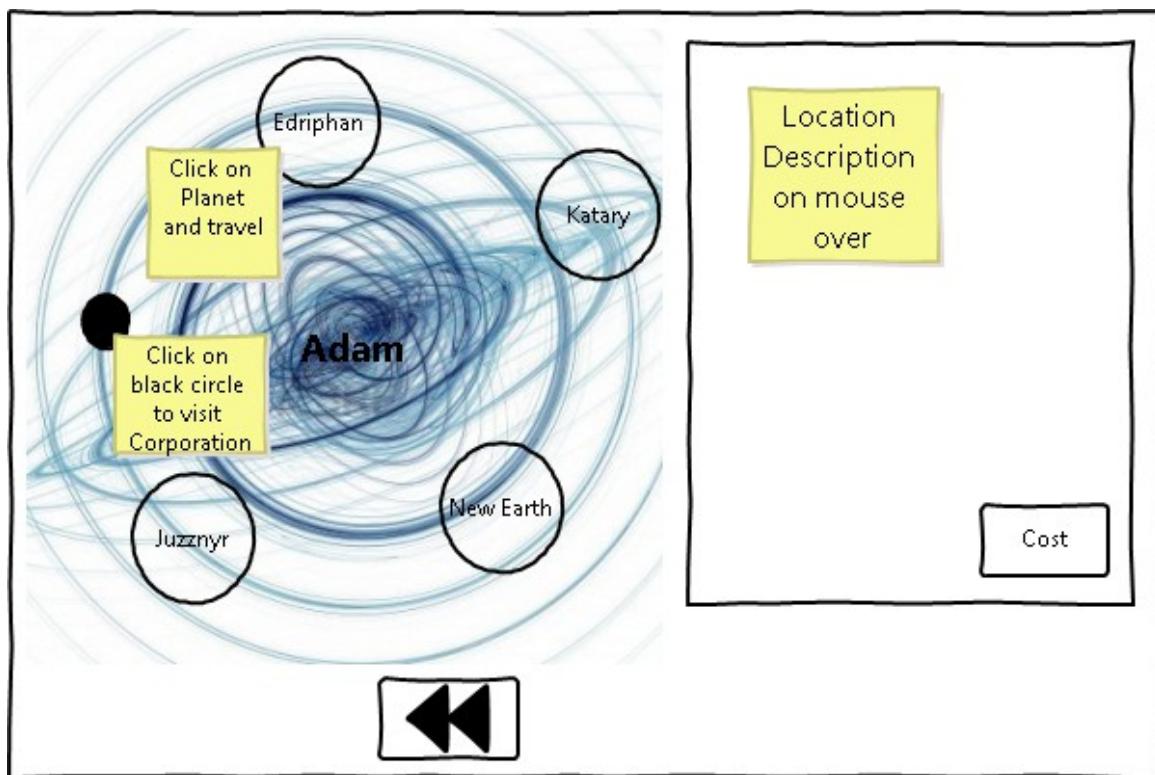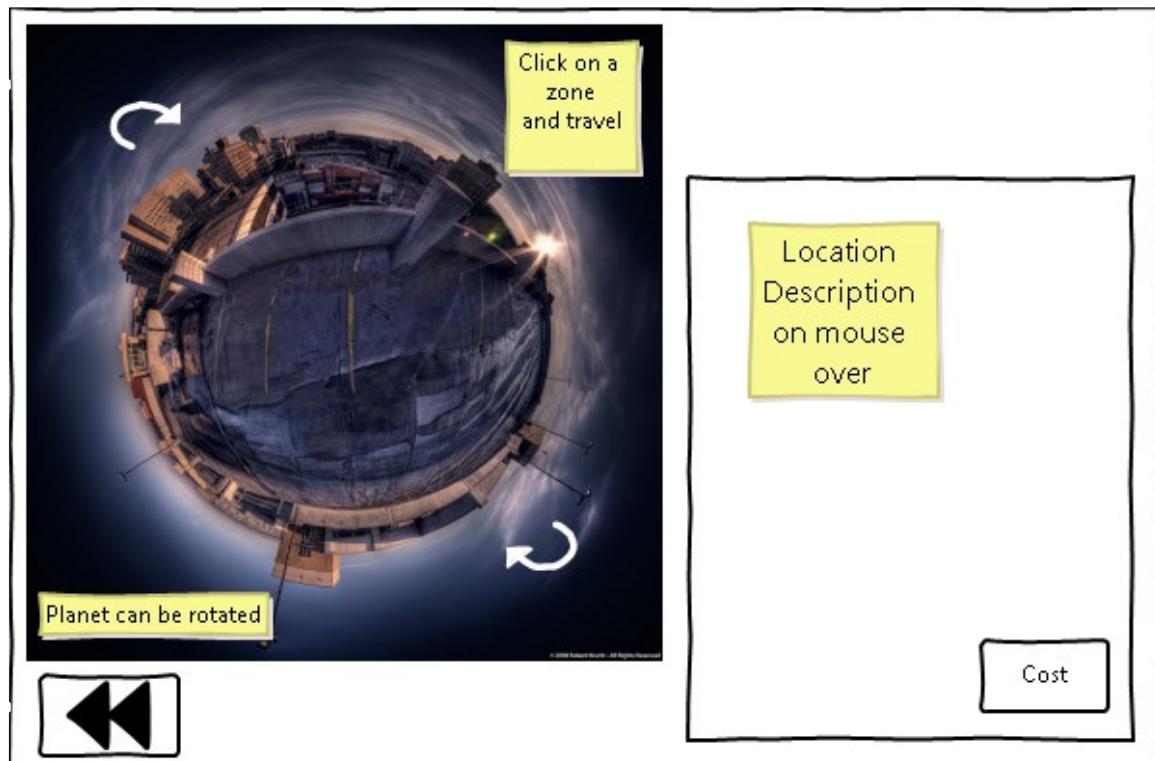
Adam Travel System Screen

Planet Travel System Screen

5.5 Co.R. Statistics

Each Co.R. Is characterized by some properties we called "statistics". It is possible to identify four of these:

- **Endurance:** is the value from which directly depends the amount of damages a Co.R. can take. Health points = f(Endurance). More Endurance assures more "health". f(Endurance) has to be a linear function so that "health" points are directly proportional to Endurance in a linear way.

- **Armor:** is the main way to reduce damage taken.
  The armor must reduce the damages in percentages following a logarithmic function in order to have a cap.
  Each point of armor affects the Laser, Melee, Missiles and Ballistic resistance. For example 1 Armor = 0.1% Laser, Missiles, Ballistic and Melee resistance.

- **Energy:** is a quantity used by the Co.R. to perform special abilities

- **Weapon Mastery:** The weapon mastery is a stat that is used to increase critical chance. It must follow a logarithmic behaviour because 100% critical chance is not so fair!
  We have to model the growth of weapon mastery in a way that, when it reaches a certain quantity, it will be very very difficult to increase the critical chance.

5.5.1 Weapon statistics

Weapon statistics are values that express its properties.

- **Damage:** the damage that a weapon can deal

- **Type:** the type of the weapon. It could be: Melee, Ballistic, Laser, Missile

- **Range:** represent the zone where the shots of a weapon could hit the enemy. It's represented by a circular sector defined by the Range stats of each weapon and it is visible in the HUD during the play.

- **Reload time:** the time that passes from a shoot to another

- **Knockback:** this quantity represents how much the target is repelled in the opposite direction of an attack

- **Hit Rate:** probability to hit the enemy if it's in the range.
  OPTIONAL: Only some weapons, like some particular ballistic weapons, can have this stat.

5.5.2 Mechanical parts and related statistics

Mechanical parts are the constitutive elements of a Co.R. A robot is made of a head, a torso, two arms and something to walk like legs, tracks, anti-gravity devices or other.
A mechanical part usually hosts space where weapons and devices can be inserted. This spaces are called "slots".
Slots can be of various types: slot for missiles, slot for melee weapons, slot for laser weapons, slot for ballistic weapons, slot for devices or multi-purpose slot.
A slot can be of various size so that it can host weapons or devices of different size.

For example, there could be a huge slot can host a little laser gun and a big laser gun as well as there could be a little slot that can host only small weapons.

Statistics related to mechanical parts:

- A mechanical part can improve all kind of stats that grow levelling up
- The torso parts can improve the rotation speed
- The leg parts can improve the movement speed of the Co.R.

Each weapon or mechanical part can also improve some other values like critical chance and damage as well as give some extra bonuses like "chance on hit" bonuses

Example:

> **name:** Reckoning hammer
> **power:** 10
> **type:** melee
> **range:** 150° - 1 mt
> **reload time:** 1 sec
> **knockback:** none
> **Hit Rate:** 90%
> **extra:** increases melee critical chance by 15%. Chance on hit to flee the enemy in terror

5.6 Growth model

The growth model is the set of rules that specify how a character evolves according to the experience gained.
In order to make more challenging the game, three tiers of experience gained per levels were defined: 1-20 (A), 21-40 (B), 41-50 (C). 50 could be a good level cap.
The three tiers have to be modelled by three different functions.

Class

The class is the main mechanic used to improve the Co.R. mechanical aspects. The class of a player foresees a skill three including all the active and passive ability used to improve movements and all the mechanical aspects such as endurance and armor. Every three levels the player gains a knowledge point to use in this tree for a maximum of 15 total points. The player can choose one of the three starting classes: Mechanic, Engineer, Scientist.

Over-class

Once the player finishes the inctroductive part of the game, he has to choose an over-class for his Co.

R., representing the combat style the robot can perform.

The over-class provides two different, but close-related, combat specializations

Levelling, the player will gain **oc points** that are the points can be used to improve the abilities of the choosen over-class.

From level 2 to level 26 the player will earn an oc point per level. From level 27 to 50 the player, differently, will gain 1 oc point every 2 level.

The player will manage a total of 37 oc points.

The abilities an over-class provides are structured in two trees: one for each of the two specializations.

The ability trees are made in order to oblige the player to fully exploit only one of them.

These are composed of three tiers. At the beginning the two lower tiers are available. In order to put oc points in the second tier the player must have spent at least 14 points in the first one. To put oc points in the third tier the player must have spent 25 points in the previous ones.

Abilities

Depending of the over-class the Co.R. player has chosen he has the possibility to buy ability chips in order to teach his Co.R. some combat abilities.

The ability chips are upgradable. Depending of the player level it is possible to unlock upgrades to the already known Co.R. abilities.

If the player wants to change his Co.R. Over-class, he automatically loses all the chips and upgrades he bought.

5.7 Combat system

When a target is in the range of a Co.R's weapon, the Co.R. can shoot and hit.

In that moment, combat system turns into play.

It is composed by 3 phases:

1) **Probability Phase:** draw of the probability to hit the target.

In this phase the system calculates if the target will be hit or miss.

This is calculated by the function:

Random(0,100)=x

- *if 0<=x<=weaponHitRate => The shoot hit the enemy*
- *if weaponHitRate <x<=100 => The shoot miss the enemy => EXIT*

NOTE: Not all the weapons need this calculation. Some weapons have 100% hit rate!

2) **Calculating Phase:** the damage is calculated basing on the enemy resistance and weapon's type.

In this second phase, the system uses the following stats from the weapon:

damage, critProbability, typeOfWeapon

2.1) First of all, the range of the weapon damage is calculated by the system using a base value that depends on the weapon.

2.2) It is calculated if the damage is critical:

Random(0,100)=x

- *if 0<=x<=critProbability => The weapon cause critical damage => damage*(Random(1.3, 2))*
- *if critProbability <x<=100 => The weapon cause normal damage*

2.3) Then, is taken into consideration the <u>Armor</u> value of the target for the typeOfWeapon that hit.

2.4) At this point, the damage is reduced by the armorResistance of the target (simply multiply the percentage with the damage).

3) Calculating Phase: the damage is subtracted by the target's HP: TargetHP – realDamage

5.8 Item generation

Nivram League Warriors provides a random item generation system based on values stored in a dedicated database. Both vendors and revenue system use the algorithm described below.

```
for i in range(1-n+1):     //n is randomly generated and it depends on who need the item list
    check the player level and rank
    set the item_level
    set the item_quality     //common, uncommon, rare, unique, set
    set required_level and required_rank
    select item_type
    if item_type == weapon:
        Randomly select a weapon_type  //ex: Ballistic
        Based on item level generate semi random stats
        Randomly select a sub_type based on weapon_type  //ex: Cannon
        Randomly select attributes based on item_quality //ex: Medium weight
        Randomly select a manifacturer based on its presence on the market //ex: LolTech
        Apply the modifier given by the sub_type, attributes, item_quality and manifacturer
        Return WEAPON
    else if item_type == mechanical_part:
        Randomly select a body parts
        Based on item level generate semi random stats
        Based on weight generate a appropriate number of slots
        Based on proper stats choose if the slot are for weapon (what kind) or devices
        Randomly select attributes based on item_quality
        Randomly select a manifacturer based on its presence on the market
        Apply the modifier
        Return MECHANICAL_PART
    else
        Return OTHERSTUFF
```

Here some detail about the item database entries usefull in order to understand the algorithm

- **item_level** is an attribute of a specific item. We can base it on player's level or we can use a DB of raw items each of them with a item_level value. Greater is the item_level more powerfull is the item. Our goal, in generating items, is to provide items to the player appropriate for its level
- **item_quality** is a global attribute defined in a table, with a single row, where are expressed all the global attributes for the items. Ex: we have the table "global_value" where we store rare=2

85 common=1234, uncommon=689, unique/set=12. This value represent the frequency of these quality. A common item is generated with a probability of 1234/285+1234+689+12.

- **required_level** and **required_rank** are attributes of a specific item. In order to use items the player has to match the right level and the right rank.

- **item_type**: an item could be a weapon, a mechanical part or something else (other stuff). Each of these "item_type"s represent an item class so we have to define three item classes with the right attributes and values.

- **weapon_type** is a subclass of the weapon class. weapon_type are Ballistic, Missiles, Melee or Laser.

- **sub_type** is a subclass of the weapon_type class. Ex: we can generally speak of Ballistic weapon or we can talk specifically of cannons, gaussian weapons, shotguns and so on.

- **manifacturer** is a kind of data we have to store in a table DB. The manifacturer must have a value for his presence in the market. Furthermore, a manifacturer is characterized by some attributes that modifies the item's attributes. We must have manifacturers for weapons and manifacturer for mechanical parts.

- **weight** is an attribute for the mechanical part item type.

The algorithm may be split in three different parts so that is possible to use the first part for weapons vendor, the second for mechanical part vendor and the third for other stuff vendor.

5.9 Modes and other features

It is possible to identify 2 big game modalities:
- **Travel Mode:** in this mode the player controls his avatar. He can move on the planet, change planet, buy or sell items in the market, modify his Co.R. using the workbench, chat with other players and take part of a arena's match.

- **Combat mode:** in this mode the player controls his Co.R.. He fights with his team or in solo against the opposite teams or player. Players enter in this mode when they start a new match selected while in the "Travel mode". When a match ends, all the players return to "Travel mode".

Each level described in 5.5 represent a different combat mode.

Encounter system

The character wandering the world of NLW will always be the Co.R. pilot, never the Co.R.

It is possible, especially at the beginning of the game when the player deals with the starting quests, that a Co.R. pilot is engaged in a fight. When this occurs, he immediatly recalls his Co.R. and there will be a change of scene: from travel mode to combat mode.

The main actor of the scene is the Co.R. and the Co.R. pilot disappears. In this way we can easily manage encounter.

This feature is not particularly important for the online game but if there was the need to add elements of PvE this would be the way in which the fighting against AI would be addressed.

5.10 Levels

a. **Maze-mode:** An unpublished mode where your objective is exit from the labyrinth before that the opposite team finds it. The labyrinth is randomly run-time generated and the exit changes position every X seconds. At the best of 3 rounds, 4vs4 Team mode.

b. **Arena deathmatch:** Classic team deathmatch. 4vs4 or 2vs2 Team mode

c. **Capture the Flag:** Take the opposite team's flag to take it to your base, and defend yours! 4vs4 or 2vs2vs2vs2 Team mode

d. **Control Point:** Take control of the "Control Point" and defend them by the other teams! Every second the points will be assigned to the team who controls more than half of the "Control Point". The team that reach Y points wins.

6. Story

6.1 Synopsis

The Adam quadrant is the birthplace of the Nivram League where the Co.R.s fight guided by theirs greedy pilots. The League has not always existed, it was founded to prevent the outbreak of war among the people of Adam. By doing this, the EV, president of the Adam's government, lets to vent the frustrations of the belligerents on the battlefields of the Nivram League.

6.2 Complete story

The quadrant A7-9D, called Adam, is one of the four quadrants of the galaxy. The systems it contains have lived periods of peace alternating with times of war. During the years a strong sense of resentment against the political class, now regarded as inadequate and accountability, grew up in people. In this way the workers were aware that they were the real heart of the economy, so they decided to form corporations, later merged into committees divided according to the profession that they represented. Soon the governments of the systems were replaced by the Council of Committees unifying the whole quadrant under its aegis. The council gave itself the name of Neftali. This new form of government foresees the existence of a supervisor, appointed by the same Neftali, called EV.

The committee of Co.R pilots soon became the most powerful and gained the opportunity to elect themselves the EV. Because of this imbalance into the Neftali tensions between the various systems arose. These tensions threaten to escalate into a violent war, but thanks to the founding of the Nivram League tensions were transformed into a cold war that is vented on the Co.R's battlefields.

Only the better equipped and most skilled Co.R pilots can win into the arenas so the production of weapons and technology becomes the central pivot of the economy of the quadrant.

At this point the only way to enforce authority within Adam is to excel as a fighter of the Nivram League.

6.3 Backstory

The Nivram League is active since many years and more and more individuals and Co.R's pilot corporations participate the fights looking for money and fame. The Nivram League pays very well: the betting surrounding the matches has an enormous business volume and technology sector occupies the largest share of the market. Being a Co.R pilot pays as well and many people tries this way to bring money into their pockets and honor to their race.

6.4 Narrative devices

Many NPCs and quest givers tell the parties first player in history, often by entering in speeches their views and their opinions.

7. The Game World

NLW is set in a far future, in the A7-9D quadrant of the galaxy, codename: "Adam".
Adam is a whole of planet and alien races.
The most important planets are "Phi", "Likary101" and "BaseThor2506" that are the center of the entire economy of the quadrant. This because, in these planets, are located the arenas of the "Nivram League", and also the refuelers of weapons and parts for the Co.R. from which the pilots can buy all they need.

Phi is a very populated planet that achieved technical breakthroughs, the most advanced of the entire "Adam". This planet is the quadrant capital and harbours vendors of weapons and Co.R.'s mechanical parts. Phi is the only planet where it is possible to found a new Corporation.

Likary101 is a Jungle planet where any pilot can find the most brutal weapons and the more resisting parts for the Co.R.. The peculiarity of this planet is that it has an almost infinite amount of artificial underground labyrinths that are used for the special maze-competition of the "Nivram League". This labyrinths were probably created by a presumably extinct alien race.

BaseThor2506 is an Ice planet that has the best sellers of advanced tactic weapons and devices of Adam. The best Co.R pilots travel to this planet to buy the most competitive and destructive pieces of ordnance.

When the player lands in one of these planets, he will be brought in the spaceport of the main city, in the city downtown. Here he can find the arena of the planet, the market and the Corporation's market where he can find all the weapons and the Co.R.'s parts the Corporations have decided to sell. From the spaceport the pilot can take spaceships in order to reach any part of the quadrant.

There are arenas in every most important planet:

- in Phi there is the "New Keys" arena: A big urban arena with huge structures with which the pilots can protect their Co.R.
- in Likary101 there is the "King of Kolukus" arena: this arena is never the same... At the start of a arena's mach, the pilots are placed in one of the planet ever-chancing labyrinths! The unknown technology with which the alien race has created these underground tunnels makes them move and change "every time the Kolukus[1] sneezes" say the legends. In this arena, the players are faced the other team in the crazy "Maze-Mode"!
- finally, in the BaseThor2506 there is the "TunderDrome" arena: An arena placed on the top of the 2 highest mountains of the planet, linked by a passage between them. The pilots must be strong and use the nature to their advantage for overwhelm the opposite team!

[1] the Kolukus is, according to the leggends, a mythological monster like a dragon that is famous for the number of sneezing during the day: 60 minimum. The legends told us that, for any sneezing of the Kolukus, a village take fire (not normal fire, magic fire!)

In then quadrant there are also a lot of orbital bases, owned by the Corporations. Every Corporation has its own orbital base that allows the members of the Corporation to develop technologies and weapons.

In "Adam" there are 4 races that compete in the arenas of Nivram League: the Sak'et-j, the Human, the Leafear and the AgaN-Vasj.

"**Juzznyr**" is the home planet of the **Sak'et-j** race. It was a green and full of life planet until a virus infected a lifeform that lived on the surface. in a few time, the Infection spread in all the lifeforms of the planet. Thanks to the virus, the creatures of the planet mutated and became aggressive, violent and intelligent. As the years went by, the creatures (now known as "Sak'et-j") developed a high level of technology, such that the entire planet was transformed in a metallic planet full of technology. If the player decides to play as a Sak'et-j, his adventure start here.

"**New Earth**" is the home planet of the **Human**. Once upon time, the Human race lived in a planet called "Earth", located in a different quadrant of the galaxy. As result of technological breakthroughs, the Humans learned the technology which allow them to travel the space.
A few years later, the Earth was threatened by a giant asteroid, half as big as the Earth. With the impossibility to destroy it, the planet was evacuated. That day, the Earth was destroyed and, because of the few starships available, 4 billion people died: Half of the human population.
The survivors traveled beyond the solar system until reached the planet "Gliese 581g" that was studied for his similarity with the Earth. After landing on this planet, the Human race explored it.
The planet was desolated, but during the exploration, they found an old unknown portal. After activating it, they discovered another planet similar to the Earth and more hospitable than "Gliese 581g"; this planet was situated in the quadrant "Adam". The planet was inhabited by docile medium-sized humani-

zed-mosquitos. They killed the previous inhabitants of the planet. After killing every form of life on that planet, without sparing anyone, they were weak, because they couldn't feed anymore. When human arrived on that planet, they wiped them out without any difficulty. They decided to call this new planet "New Earth", in memory of their old home and all the people died in the accident.

After years they discovered other planets, other races and joined in the Nivram League.

If the player decided to play as a Human, his adventure starts here.

"**Edriphan**" is the home planet of the **Leafear**. The planet is surrounded by giant plants and woods. In principle, the Leafear were creatures that took care of the nature. When they discovered that the planet was a rich source of "Xoluster" (now known as the most resistant and malleable element in the entire Adam) they began to look for a way to merge their loved nature and the new material just discovered.

After several years, they reached the objective of putting together this new material and the power of planet's nature. Now, they want to demonstrate to other races that their technology is the best of the entire quadrant, and they want to prove this, fighting in the Nivram League!

If the player decides to play as a Leafear, his adventure start in Edriphan.

"**Katary**" is the home planet of the **AgaN-Vasj**. This planet is very tiny and presents a lot of volcanoes; magma and lava are the agenda. The AgaN-Vasj is the only specie on the planet. They have a natural immunity to the high heat because AgaN-Vasj have adapted to those extreme conditions of the planet. They believe in 3 elder Gods, who give them the most advanced technology.

The 3 Elder Gods are: Chosmos (the god of chaos), Katary (the god of fire and of volcanoes) and Bahakdor (the god of war). When the Nivram league was founded, Bahackdor told all the AgaN-Vasj that they HAD TO fight in the arenas of the competition for win, "IN THE NAME OF BAHAKDOR"!

To do this, Katary forged weapons to their subjects, Chosmos taught them the bases of technology and gave them mystical powers to use for strengthen the power of their weapons and the resistance of their armors. Since that day, all the AgaN-Vasj fight in the Nivrea league in order to win a sort of crusade in the name of their elder Gods.

If the player decided to play as a AgaN-Vasj, his adventure starts in this planet.

8. Media list

Nivram League Warriors uses many sounds from Freesound, for the full list see here: http://novagelida. altervista.org/index.htm . All the sounds from third parties were edited and adapted for the game by Simone Corsaro.

All the musics used in Nivram League Warriors were composed and performed by Simone Corsaro.

All the artworks, the 2D graphic and the graphic design of the characters are by Giovanni Alessandro Spina.

The 3D models of the characters are by Mattia Lazzari and Luca Leone.

Below a list of the 3D asset (Model plus textures) used in the prototype version of Nivram League Warriors

Asset name	Source
Metal file cabinet	http://opengameart.org/content/metal-file-cabinet
Mortis and tenon table	http://opengameart.org/content/mortis-and-tenon-table
Broken gear	http://opengameart.org/content/broken-gear
Metal safe with combination lock	http://opengameart.org/content/metal-safe-with-combination-lock
Shaker style workbench	http://sketchup.google.com/3dwarehouse/details?mid=82d7bee0c49a59a02331b5d5dd1cf817&prevstart=0
Rock (1) 3D model	http://thefree3dmodels.com/stuff/architecture/rock_1/11-1-0-1846
Galacticcen 3D model	http://thefree3dmodels.com/stuff/architecture/galacticcen/11-1-0-1758
Block 1 3D model	http://thefree3dmodels.com/stuff/architecture/block1/11-1-0-1753
Scene elements 3D Model	http://thefree3dmodels.com/stuff/architecture/scene_elements/11-1-0-1735
Water tower unfinished 3D model	http://thefree3dmodels.com/stuff/architecture/water_tower_unfinished/11-1-0-1727
Street lamp 3D model	http://thefree3dmodels.com/stuff/architecture/street_lamp/11-1-0-1625
Support 3D model	http://thefree3dmodels.com/stuff/architecture/support/11-1-0-781

| Floodlight generator 3D model	http://thefree3dmodels.com/stuff/vehicles/floodlight_generator/13-1-0-737
Sci-Fi Aircraft 3D model	http://thefree3dmodels.com/stuff/aircraft/sci_fi_airship/15-1-0-430
Heavy barrel 3D model	http://thefree3dmodels.com/stuff/accessories/heavy_barrel/21-1-0-1513
Explosive barrel 3D model	http://thefree3dmodels.com/stuff/accessories/explosive_barrel/21-1-0-1508
Rast barrel 3D model	http://thefree3dmodels.com/stuff/accessories/rust_burrel/21-1-0-1503
Terminal 3D model	http://thefree3dmodels.com/stuff/accessories/terminal_3/21-1-0-1512
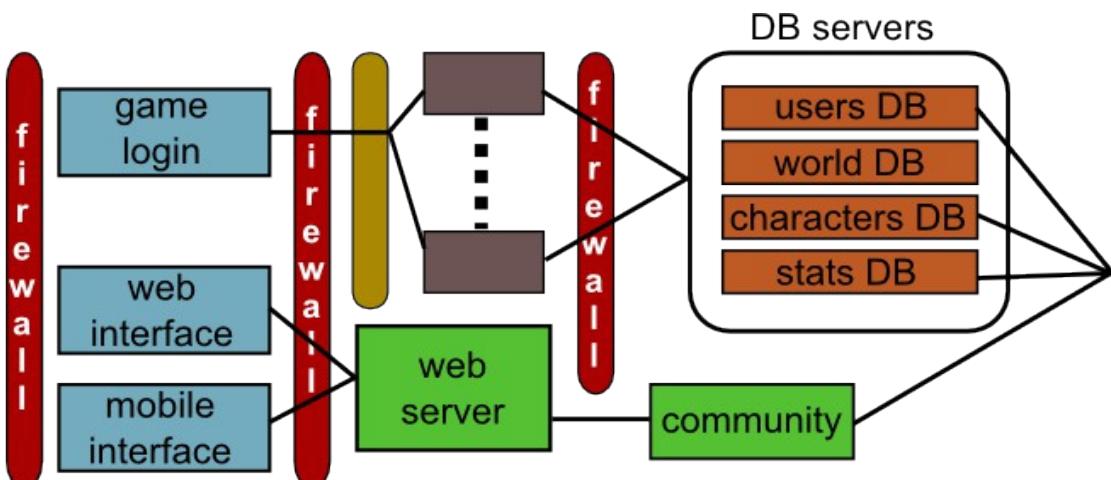
All this asset were modified by Luca Leoni, Mattia Lazzari (if the model needed mesh editing), Rosario Crisci (shader and color editing) and Rocco Dereviziis (animation where needed).

All the other Assets are properties of T3R Gamedev.

9. Technical Spec

9.1 Technical analysis

NLW is supposed to be a MMORPG with thousands users. This is a minimal networking infrastructure to manage and let play a lot of players providing them some services like the mobile interfaces, support for in-game communities, an on-line viewer for personal stats and the configuration of own Co.R.

Between the first two firewalls are located the user interfaces: Web and mobile interfaces and game login. We call this zone DMZ (Demilitarized Zone).

Beyond DMZ there are the web server, the community services and another firewalled zone where the game servers are placed. A loadbalancer, between the firewall and the servers, will distribute the servers workload.

We need more than one game server in order to quickly manage the players in the different parts of NLW world. The game servers need to be placed in the countries where the majority of players is located in order to reduce the RTT and consequently offer a low latency service.

The computational power of game server has to be enough to manage hundreds connections and all the game mechanics.

The client has only to send requests to the servers, game servers will elaborate them and so it will send the replies. Requests are sent/received using a specific application protocol.

Furthermore, several databases are needed.

In order to manage the game NLW system needs a character DB and a world DB.

The characters DB contains all the informations about the in-game character. A character is uniquely linked to a user account so it is very important to have a separated users DB so it is possible to manage users' informations without interferring in game. The world DB is a huge DB that contains all the information about the world and the game mechanics. In addition to these three databases NLW needs a stats DB. This DB will contains all the achievements and the game statistics for each character of each user. In this way there will be a complete set of game information separated from the server code and located behind a complex firewalls system.

9.2 Development platforms and tools

The code is written using **monoDevelop**, **Eclipse*** and **Notepad++***.

The 3D model are developed using **Autodesk 3D Studio Max**, **Sculptris***, **Blender***.

The image are created and edited using **Adobe Photoshop CS5**, **Adobe Illustrator CS5**, **Inkscape***, **Gimp***.

The audio is created and edited using **Audacity***, **Image-Line Fruity loop 10, Adobe Audition 3.0** and **Propellerhead Reason 5**.

(*) License not needed for these software

9.3 Delivery

The game will be delivered online because, in this way, it's worldwide accessible and has no costs for physical production and delivery.

We'll provide a dedicated server for the download of the game, separate by the game servers.

The only purchasable physical object could be a collector edition that includes some gadgets.

9.4 Game engine

In order to develop a prototype we choose Unity 3D. We decided to use Unity because it is simple and our Java knownledge was enough to learn C# easily.
The time we had was very short, for this reason we decided to utilize all our knowledge in order to focus our forces on the prototype developing.
Furthermore, one of T3R developer has already worked with unity.

9.5 Server System Requirment

The server minimum system requirement to support a maximum of 160 users at the same time are:

- O/S: Mac, Windows, Linux. (Specification imposed by SmartFox)
- CPU: 1.8 GHz single cor processor or equivalent
- RAM: 2GB
- HD: 150MB + Database
- Installed Software: SmartFoxServer 2X (v1.0), MySql

This configuration is valid **only** if you choose not to use the distributed architecture described in 8.1. Otherwise, on the game servers is needed the installation of SmartFoxServer 2X (or a proprietary solution), and on the DB servers is necessary to install a NoSql DB Engine.

9.6 Client System Requirement

See chapter 3.3

9.7 Effort and Costs estimate

In order to develop Nivram League Warriors T3R prefers to use an agile approach, with a team structured as follow:

#	Role	Effort (man-months per person)
1	Team Leader	4
4	Programmer	3
2	3D Artist	3
1	3D Animator	4
1	Art Director	3
1	Audio Designer	3
1	Data Manager	3

Adopting the eXtreme Programming method, the team leader can manage the four programmers basing on "stories". Using 4, skilled, programmers the Game Designer can assign a different task for each couple of programmers. T3R gamedev's experience teaches that pair programming is a winning strategy. The team leader, in this setting, is the game designer that has to use the "stories" to assign task to the programmers on the basis of the design document.

Fixed costs:
- The costs in setting up and mantaining the infrastructure described in charapter 8.1
- The cost of the Customer Service

Operating costs:
- The costs of High Availability services
- The costs in licensing all the software needed to build the game (Unity 3D license and, unless we will opt for proprietary solutions, the license of smartfox server)
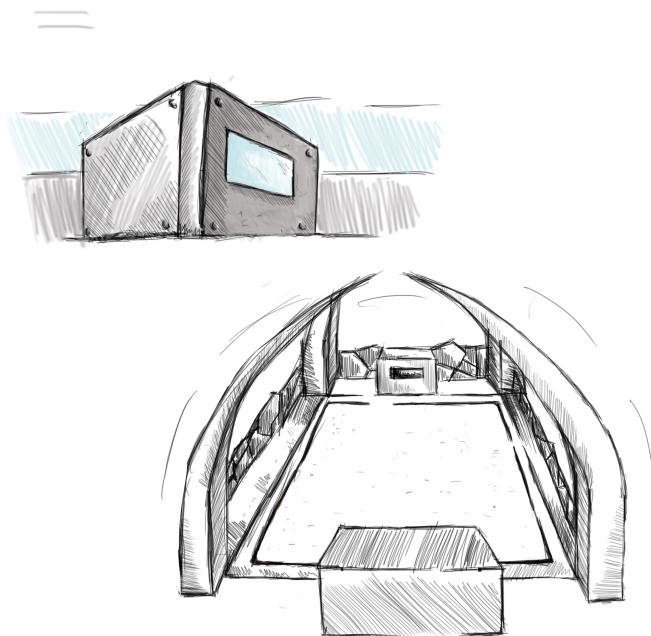
Variable costs:
- The salaries for all the employed described above
- The salaries for the testers
- Advertising costs

When the project will be developed for about 50%, we will need to hire testers and someone to take care of advertising and marketing.
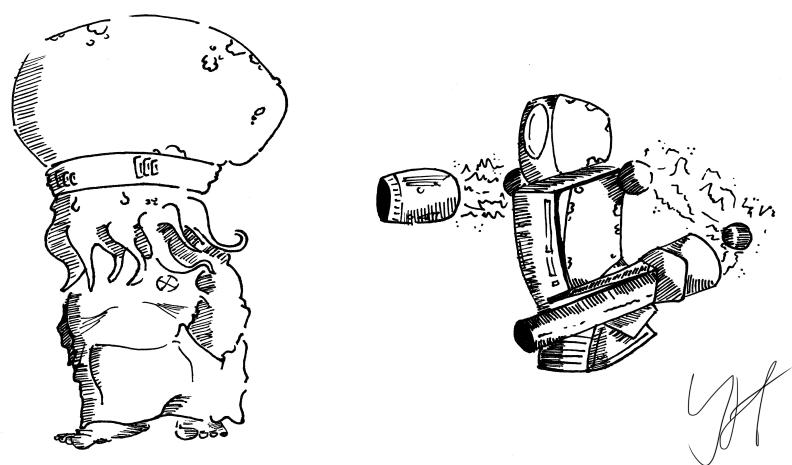
When the main feature will be completed it will no longer be sufficient to test the game using the company testers so the closed beta strategy will be the way NLW will be tested from a certain point on.

# 10. ArtWork
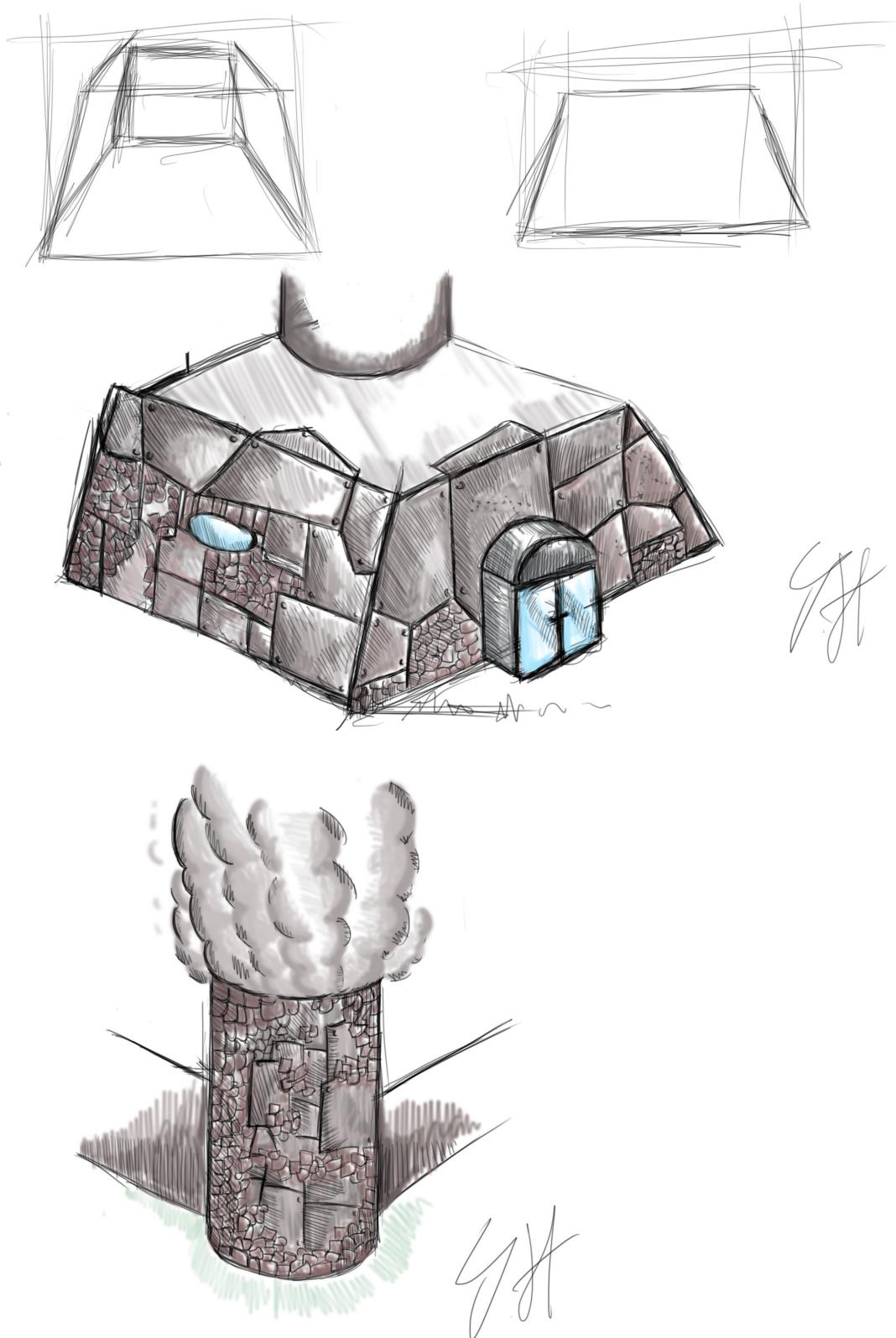
Arena prototype
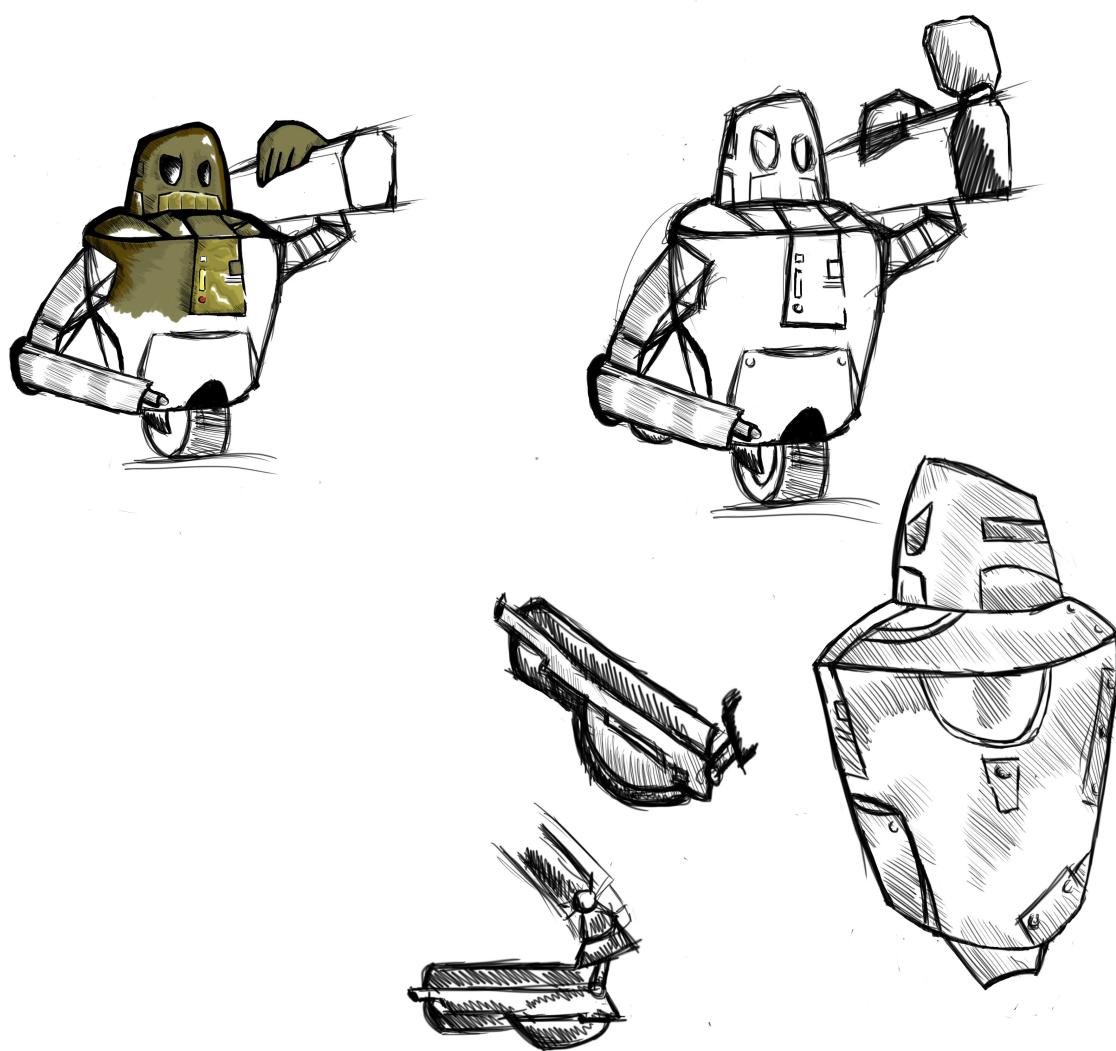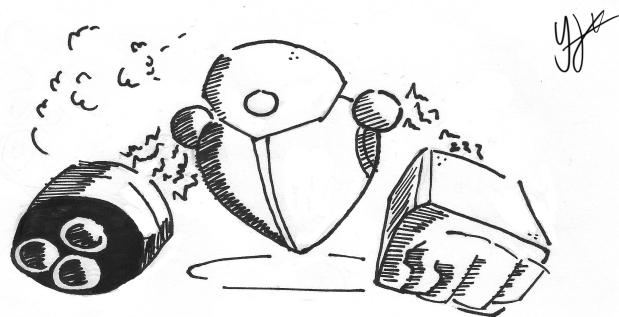
Alien and Co.R. draft
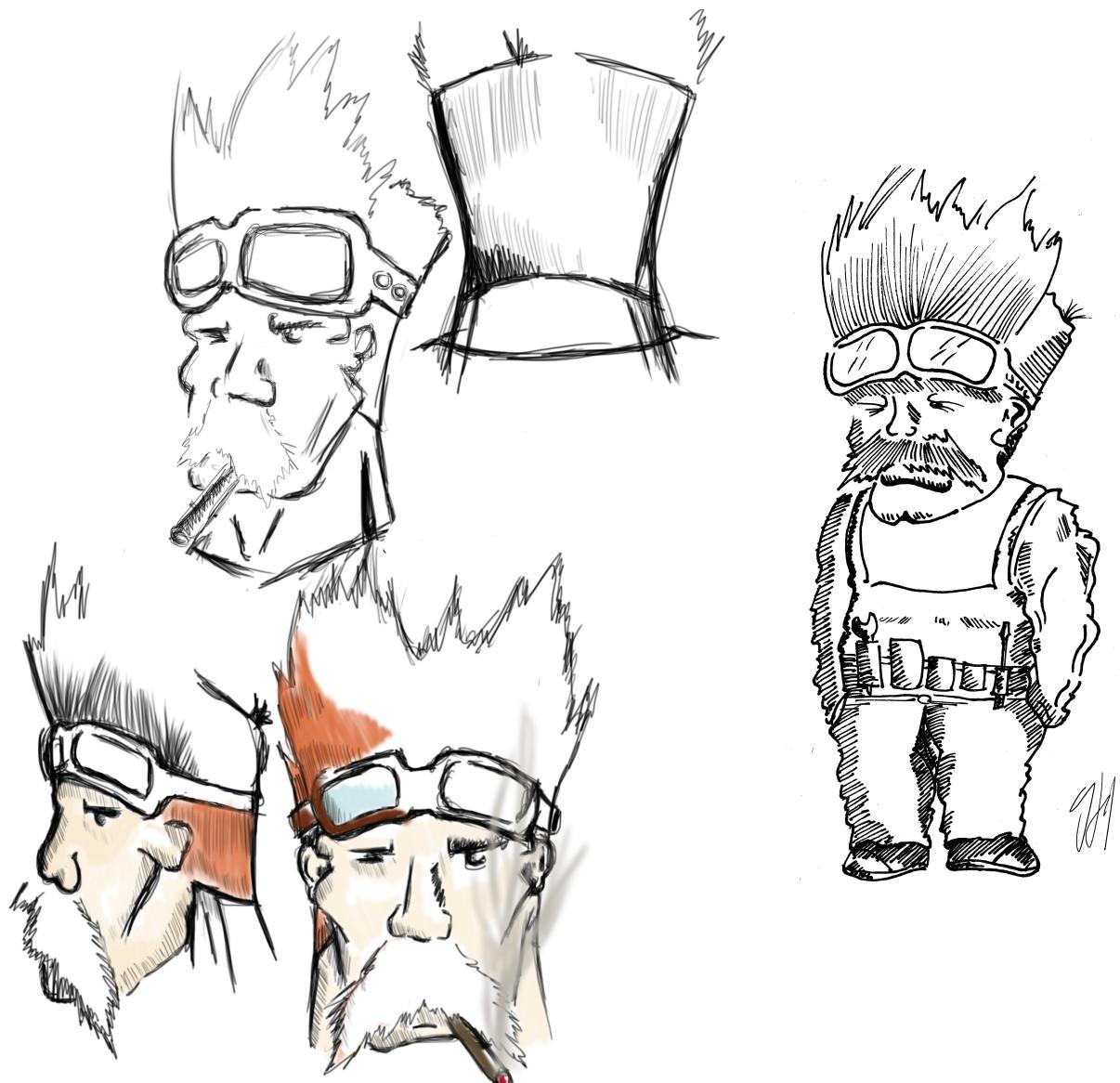
Workshop prototype

Various Co.R. drafts
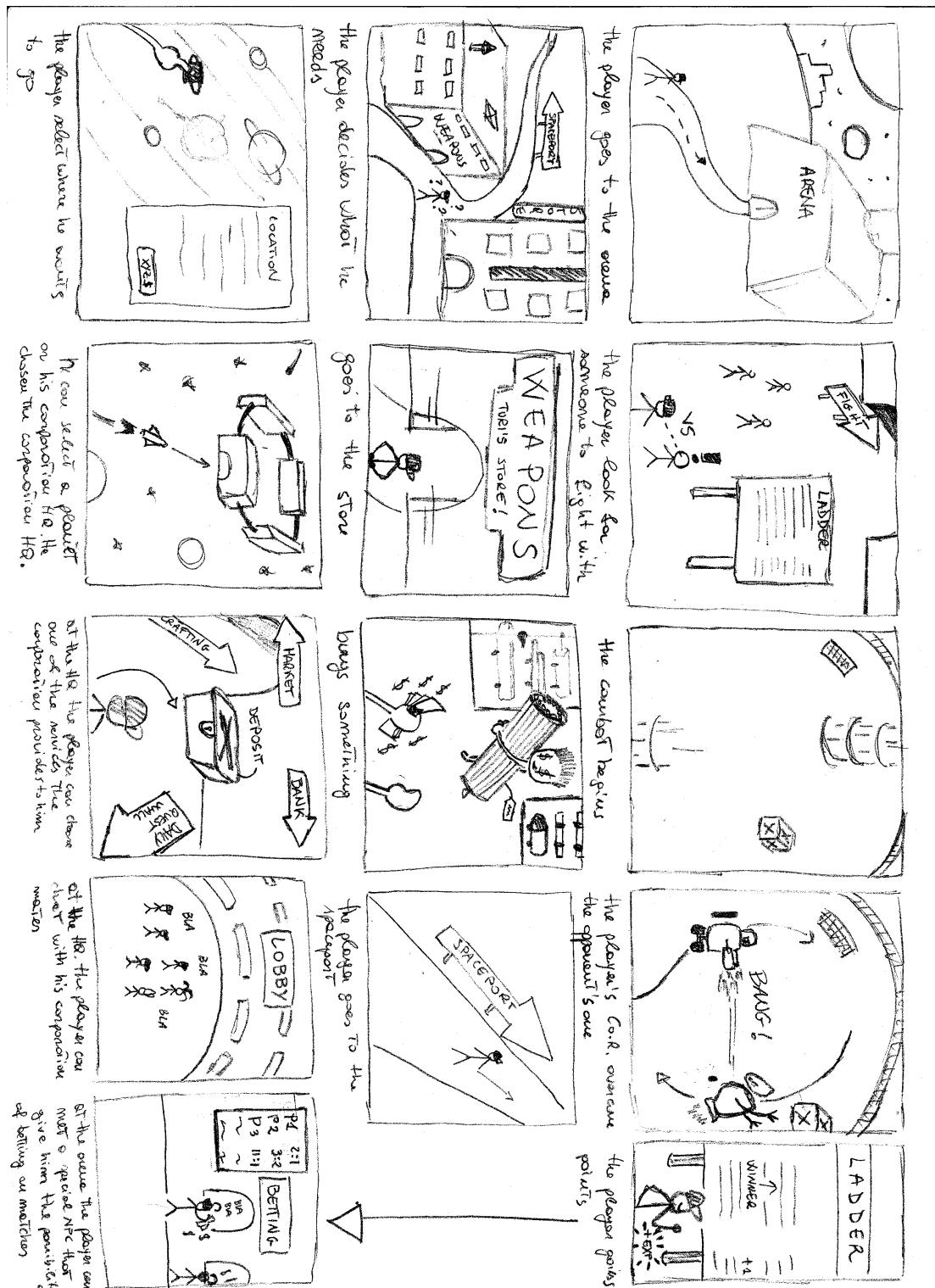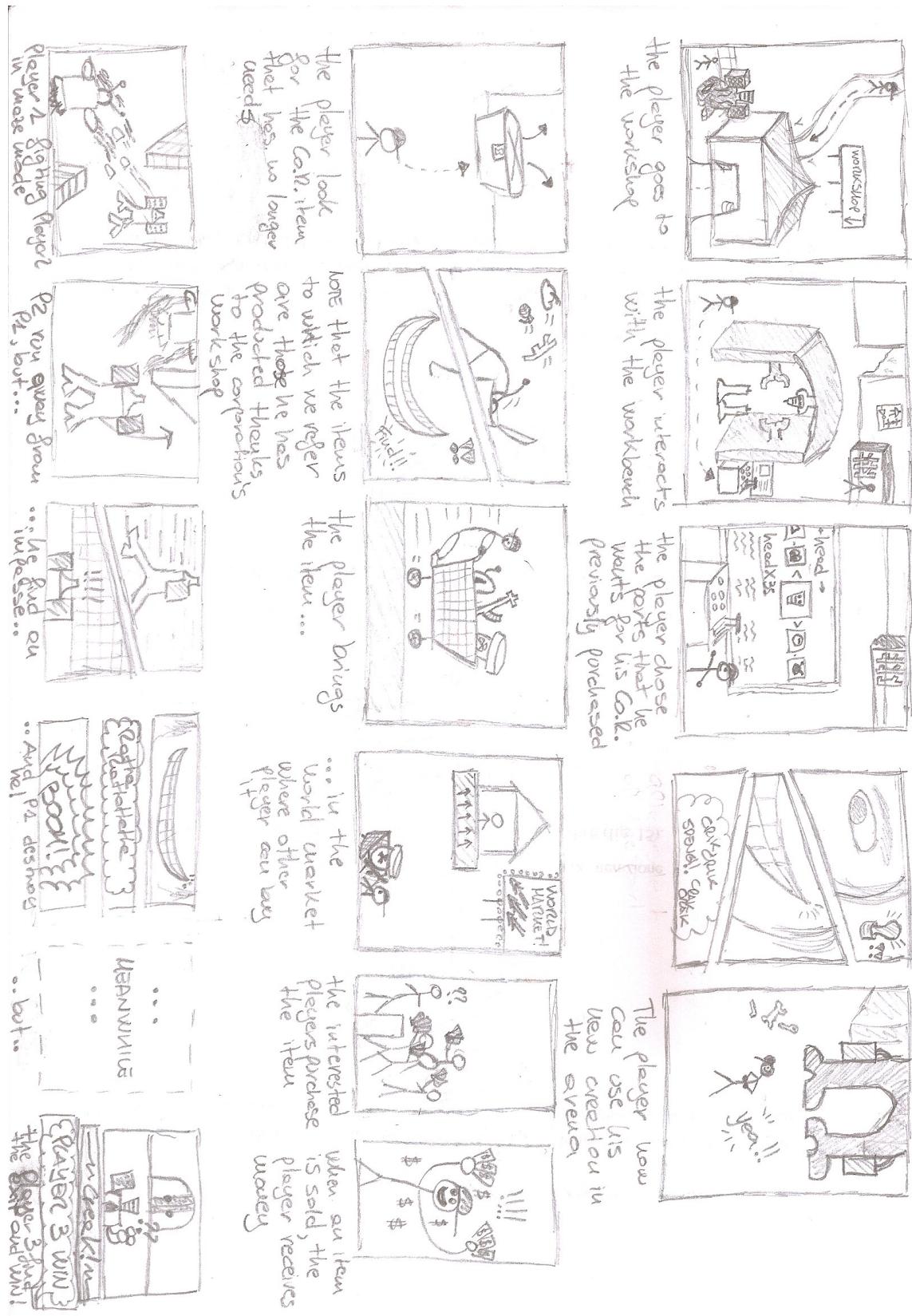
Mechanic and Engineering drafts

11. Storyboard

Note: Every line is indipendent from the other. Each one of this 6 story tell an unique part of the game-play's core.

The player goes to the workshop

The player interacts with the workbench

the player chose the parts that he wants for his Cah. Previously purchased

The player look for the Cah. item that has no longer needs

NOTE that the items to which we refer are those he has produced thanks to the corporation's workshop

The player brings the item ...

... in the world market where other player can buy it

The player now can use his new creation in the arena

The interested players purchase the item

When an item is sold, the player receives money

Player 2 fighting Player in arena mode

P2 you away from P4, but...

"We find an impasse..."

Rather Hahaha My book!!! ... And P4 destroy the

MEANWHILE ... ... but...

PLAYER 3 WIN The Player 3 the Battle and win!

12. Project Progress: What can I find in the Prototype?

Actually T3R has developed the following features of NLW:

1. A Linkary101 village. Here the player can meet and chat with other players.
2. In the Linkary101 village there are also big construnctions that have a terminal that give the player the possibility to join the maze-mode competition (KingOfKolokus arena).
3. The KingOfKolokus arena that implements the Randomly Generated Labhirinth System: the labyrinth changes the exit position every 20 seconds so that the player has to find it quickly while the oppents try to destroy his Co.R.
4. Implemented the maze-mode, supporting 1 vs 1 competition (Is it possible to reconfigure the server to support until to 10 vs 10 competition).
5. Implemented a basic combat system.
6. Implemented a chat with a global channel.
7. Implemented the Co.R. part assembly logic that takes the various parts of the player's Co.R. from the server (arms, legs, head, body, weapons) at each start session of the maze-mode. Indeed, the 2 Co.R. have the same components of the body but different weapon equipped. At this stage of the implementation we can not change the single part of the cor in game.
8. All the game code (client and server side) is tought to be reusable and easily expandable.