Battle490

Final Project Presentation

Introduction

Team Members

- ➔ Phyo Wai Yan Thein Shwe
- ➔ Muhammad Hilmi Badrol Hisham
- ➔ Ayda Rahimi
- ➔ Nima Yousef Hakimi
- ➔ Gagan S Brar
- ➔ Sai Pappu

Vision Statement

- ➔ An **Augmented Reality Turn-Based Strategy** Game
- ➔ Player can **control multiple characters** and need to **rake up points** to a certain limit before they can finally launch the attack to **destroy their opponent's Supercomputer**, all while **protecting their own** Supercomputer

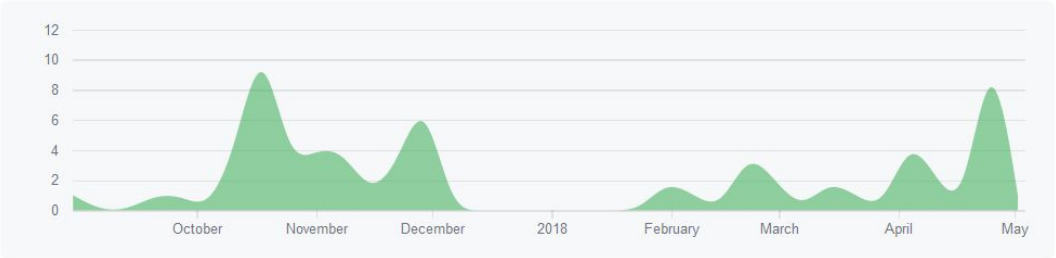
Roadmap

- Characteristics
  - **Augmented Reality Mobile Game**
- Deployment Environment
  - **Android 7.0 Nougat** and above
- Development Tool and Language
  - **Game Engine: Unity**
  - **Augmented Reality Engine: Vuforia**
  - **Primary Language: C#**

Project Achievements

SLOCs Produced

- 2017
  - Estimation: 1000
  - Actual: 972
- 2018
  - Estimation: 1000
  - Actual: 1301



- We were able to find libraries that does what we needed better than what we wrote, so we modify those and integrated them in. So our actual SLOC got reduced by quite a bit.

Risks Realized and Mitigated

- Augmented Reality implementation
  - Google ARCore is still new and not stable
  - **Solution: Unity Vuforia - have easier integration due to the tools we use**
- Multiplayer Client implementation
  - **Solution: A lot of optimizations and modifications on Netplay and Unet was needed for it to work on mobile platform**
- Overall coding efficiency
  - Back-end Team couldn't start until Front-end Team finished their parts of code (and vice versa)
  - **Solution: Thorough work scheduling to ensure no work got accidentally overwritten**

Risks Realized and Mitigated

- Game Testing difficulties
  - Debugging have been pretty difficult after AR implementation
  - **Solution: Pushed the AR implementation back until after the whole project is done**
  - Unstable Campus Wi-Fi disrupting the whole testing sessions
  - **Solution: Got our own router to host the game without depending on the campus Wi-Fi network**
  - Need multiple phone on-site to properly test the game
- Resource restriction on phone
  - There was less memory and less mobile data to work with so when we actually start testing on phone, we had to go back and optimize more to improve the quality of the game.

Risks Realized and Mitigated

- ➔ Implementing Input Manager
  - ◆ Cross Platform Manager no longer supported with the latest Unity build
  - ◆ **Solution: Rewriting the Input Manager code that works with different platform**
- ➔ Working with Unity Beta
  - ◆ Unity keep changing and updating their features
  - ◆ But we need to use Beta version in order to get Vuforia implementation working

Project Schedule and Sprint Retrospective

Introduction

- ➔ Each sprints is **planned** and **documented** in the form of a simple **Project Schedule**
- ➔ This **Project Schedule** also works as the base for our **tasks division and management**
  - ◆ Project Schedule acts as the **big idea** of what the team **should do in each sprint**
  - ◆ The task then got **broken down** into smaller pieces and these smaller tasks is then got sent to Trello
  - ◆ Team member then picked and **worked on their given task** as assigned to them in Trello

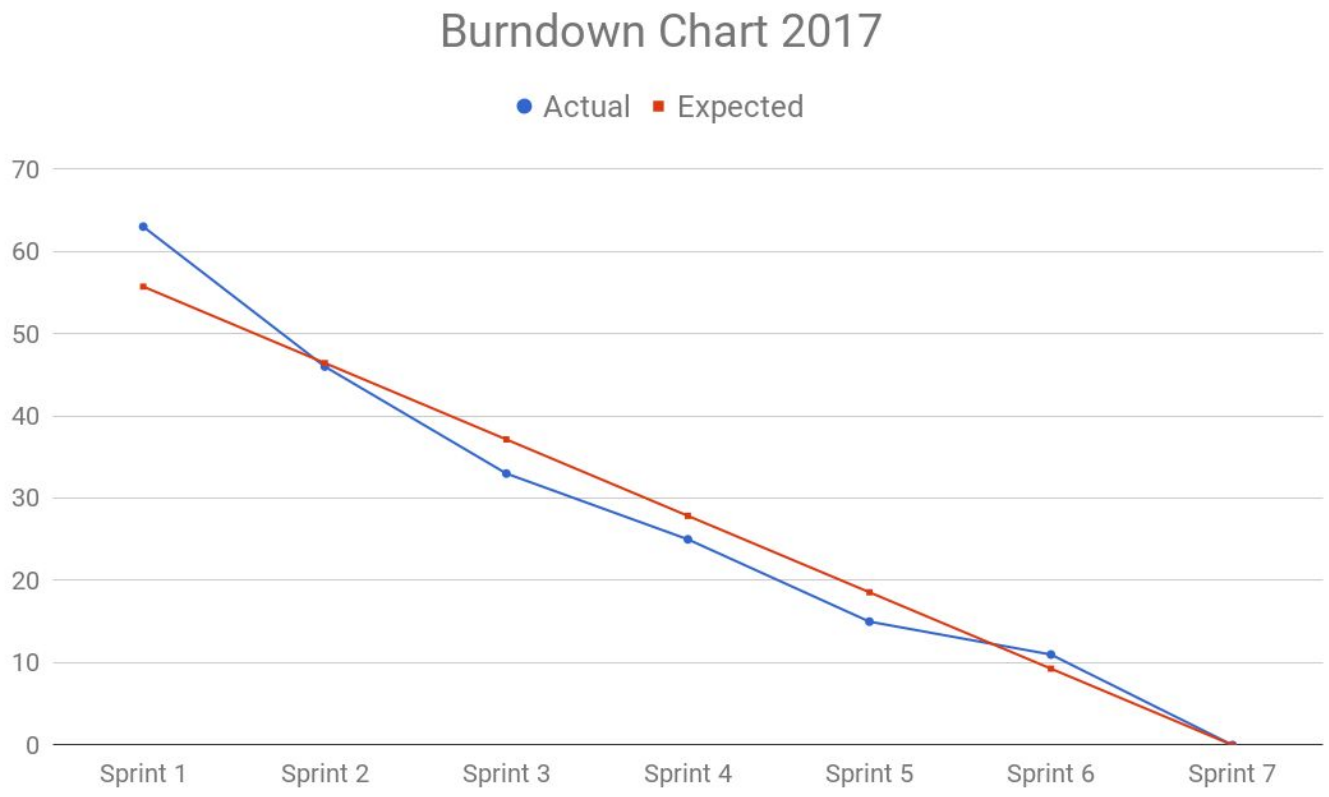
Project Schedule and Sprint Retrospective

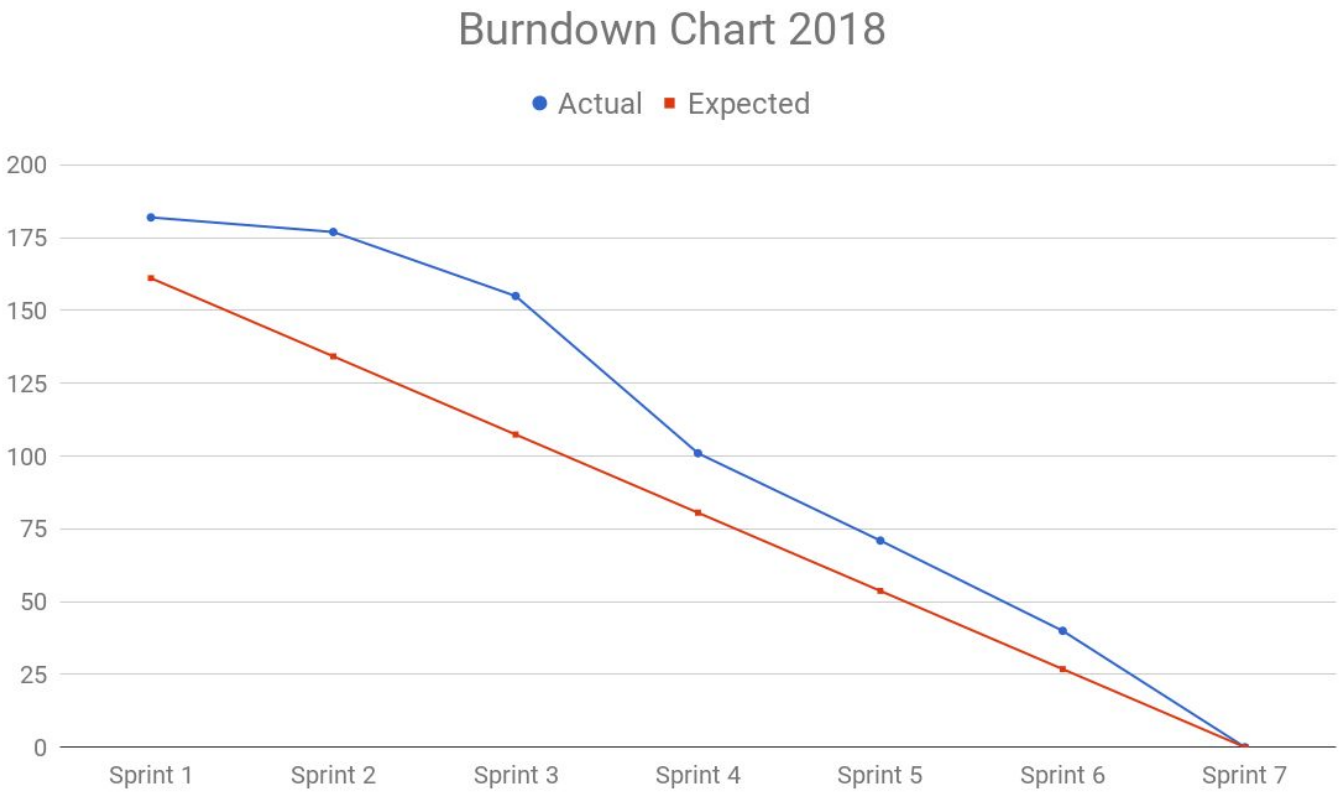
- At the end of each sprint, the whole team got together for **Sprint Retrospective** session
  - These Sprint Retrospective then got **recorded in the Project Schedule** in simple peer review artifacts format
- Based on Sprint Retrospective, the team then **decide the task** for next sprint

Engineering Work Products Produced

Project Backlog

- Our team used **Trello** to **organize the tasks** given to every members
  - Every tasks got organized by its status
    - **Backlog** → **To Do** → **In Process** → **To Verify** → **Done**
  - There's also sections called "**Risks Management**" and "**Dropped**"
- Every given tasks also been recorded in the **spreadsheet** format of **Project Backlog**
  - This gives us more **detailed view** of each tasks
  - Any **additional remarks** regarding the task and the **date the task got solved** also recorded here

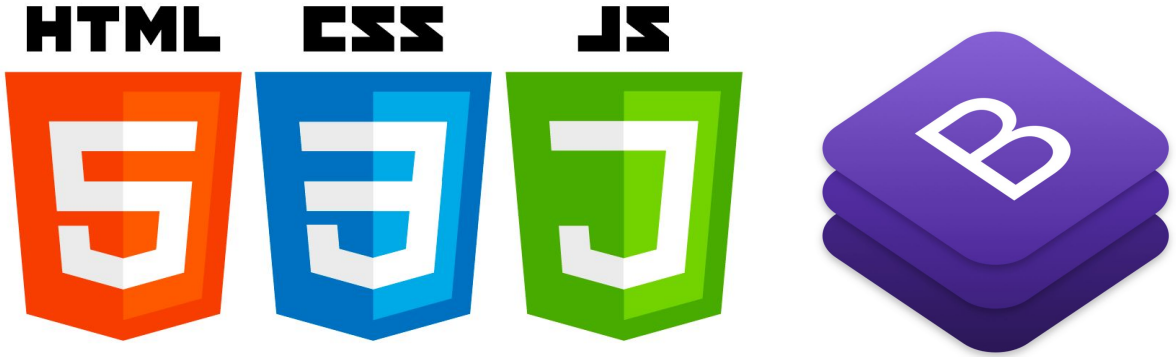

Burndown Chart 2017
Actual
Expected
70
60
50
40
30
20
10
0
Sprint 1
Sprint 2
Sprint 3
Sprint 4
Sprint 5
Sprint 6
Sprint 7


Burndown Chart 2018
Actual
Expected
200
175
150
125
100
75
50
25
0
Sprint 1
Sprint 2
Sprint 3
Sprint 4
Sprint 5
Sprint 6
Sprint 7

Design Documentations

- Our **Project Design** was built using **text-based format**
  - More **details about the game** and **functionality implementation** can be written and **explained better right until the very small details**
  - This is to ensure every team member have the **same vision** of what the game that we will be making
  - **UML diagrams** also have been used to draw out the **general idea** of how each component interacts with each other

Website for the Project

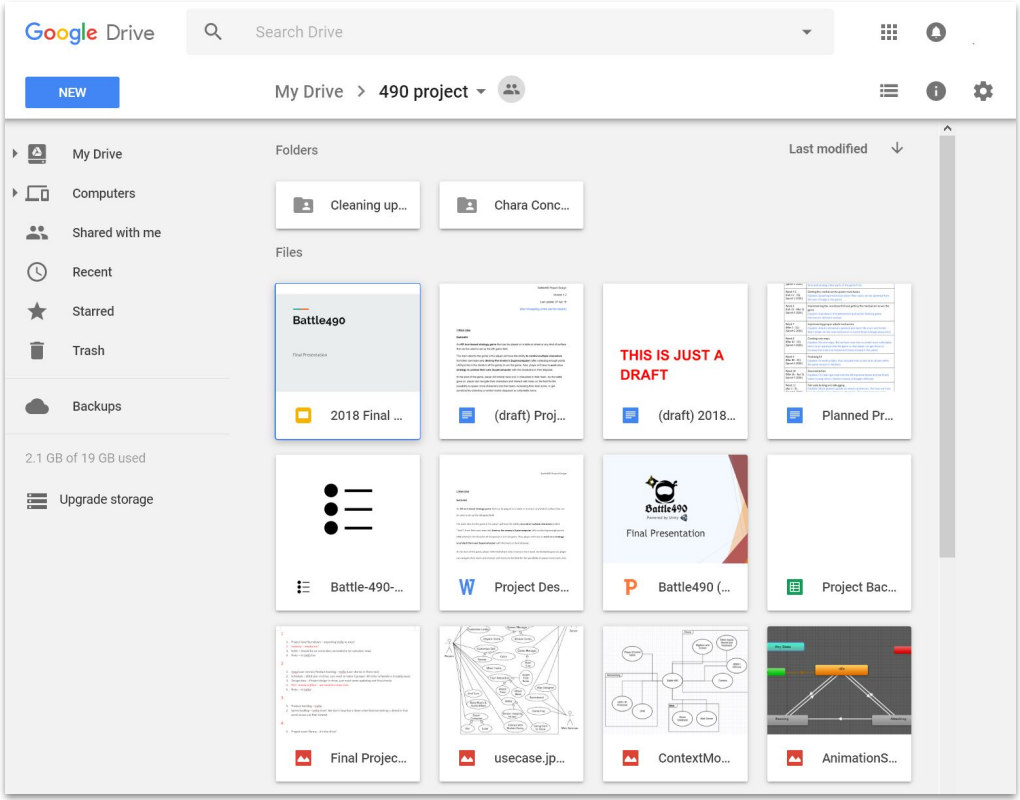


➔ https://www.rnptech.com/projects/battle490/

Project Management Tools

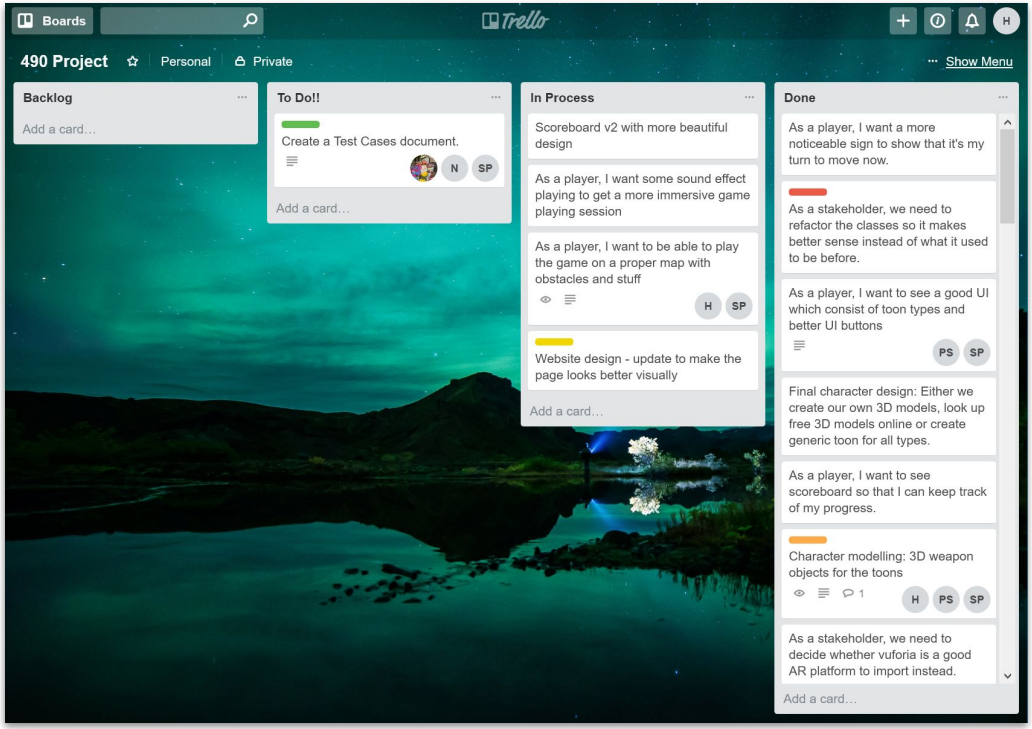
Project Asset Library

➔ Google Drive



Project Tracking Tools

- **Trello**
  - Also available in **Spreadsheet version**



Source Code Versioning and Organization

- **GitHub**
  - https://github.com/hilmihisham/Battle-490

Issues and Bug Tracking

- **GitHub Issues page**
  - https://github.com/pyrotimux/Battle-490/issues

Project Retrospectives

Project Downsizing and Modification

- ‘One-hit kill’ attack functionality
  - **Replaced with much improved attack mechanism**
- Single player mode
  - **Need a huge amount of time to build an AI that can fully utilize every strategy available in the game**
- Toon’s hiding ability
  - **The team decided that this function will only hinders the playability of the game**

Project Downsizing and Modification

- ➔ Original characters design
  - **Couldn’t create the original characters’ 3D models from scratch due to lack of time**
  - **Community-built 3D models helps us to improvise and create game characters that are in line with the theme of the game**
- ➔ Game Scoreboard
  - **In-game scoreboard implementation was successful** but **Global Scoreboard couldn’t make it in time**

General Project Issues

- **Team management** difficulties
  - Getting **project schedule** to **fit for every team member**
  - Every team members have **other commitment** too (graduating seniors (busy schedule), jobs, etc)
- **Tools** used while building this project
  - Everyone **lack prior experience** of using **Trello as tasks management** tools

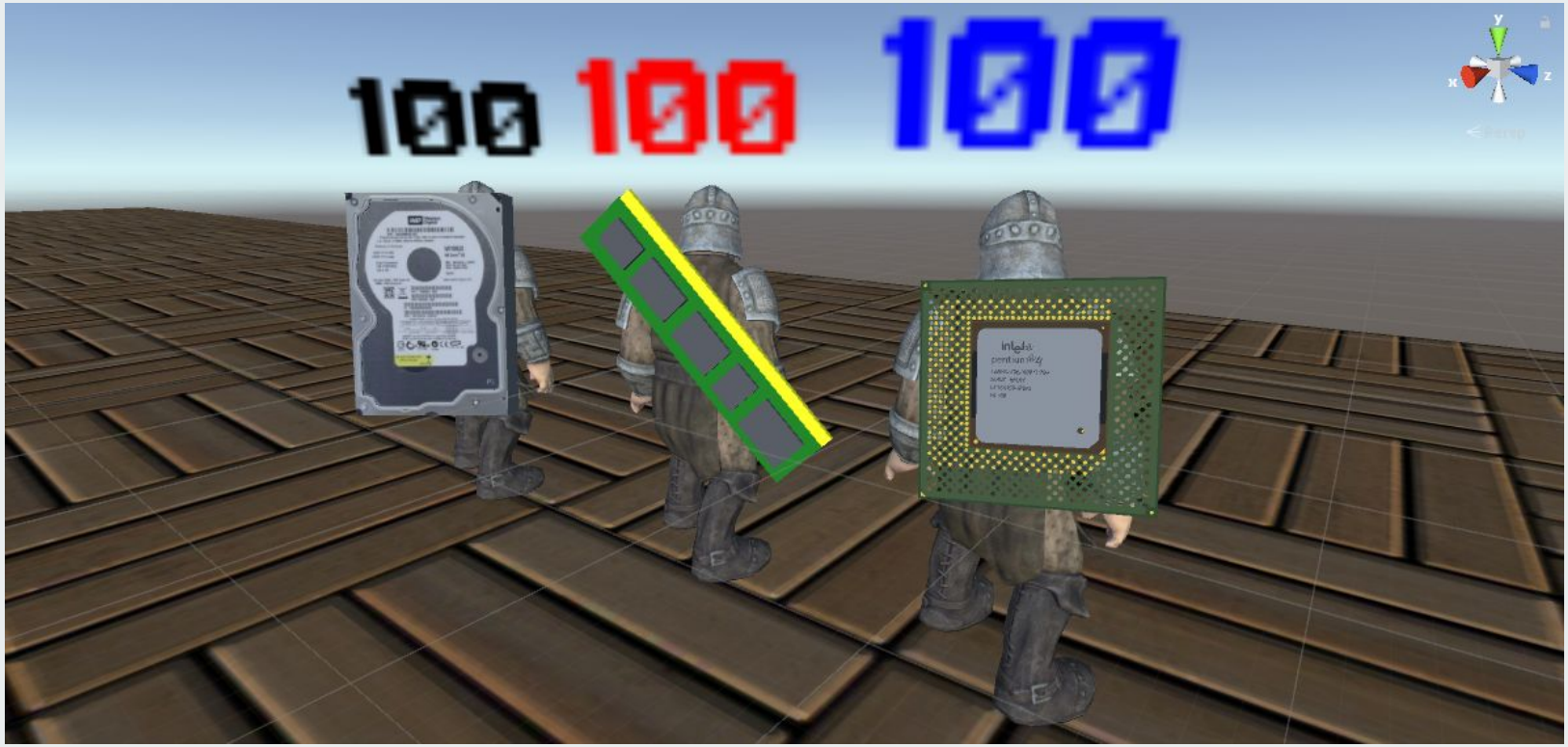
Future Plans for Battle490

- ➔ Create a ladder ranking system where players can show off their skill and highest score
- ➔ Integrate with the Level Designer project so users can create the map and play on it
- ➔ Possibly get rid of marker paper and spawn the map on any surface
- ➔ Have unique attack animations and particles
- ➔ Unique skins for the toons and also better model of computer components
- ➔ More toon ideas
- ➔ Dynamic map generation
- ➔ Add more player support
- ➔ AI for single-player mode

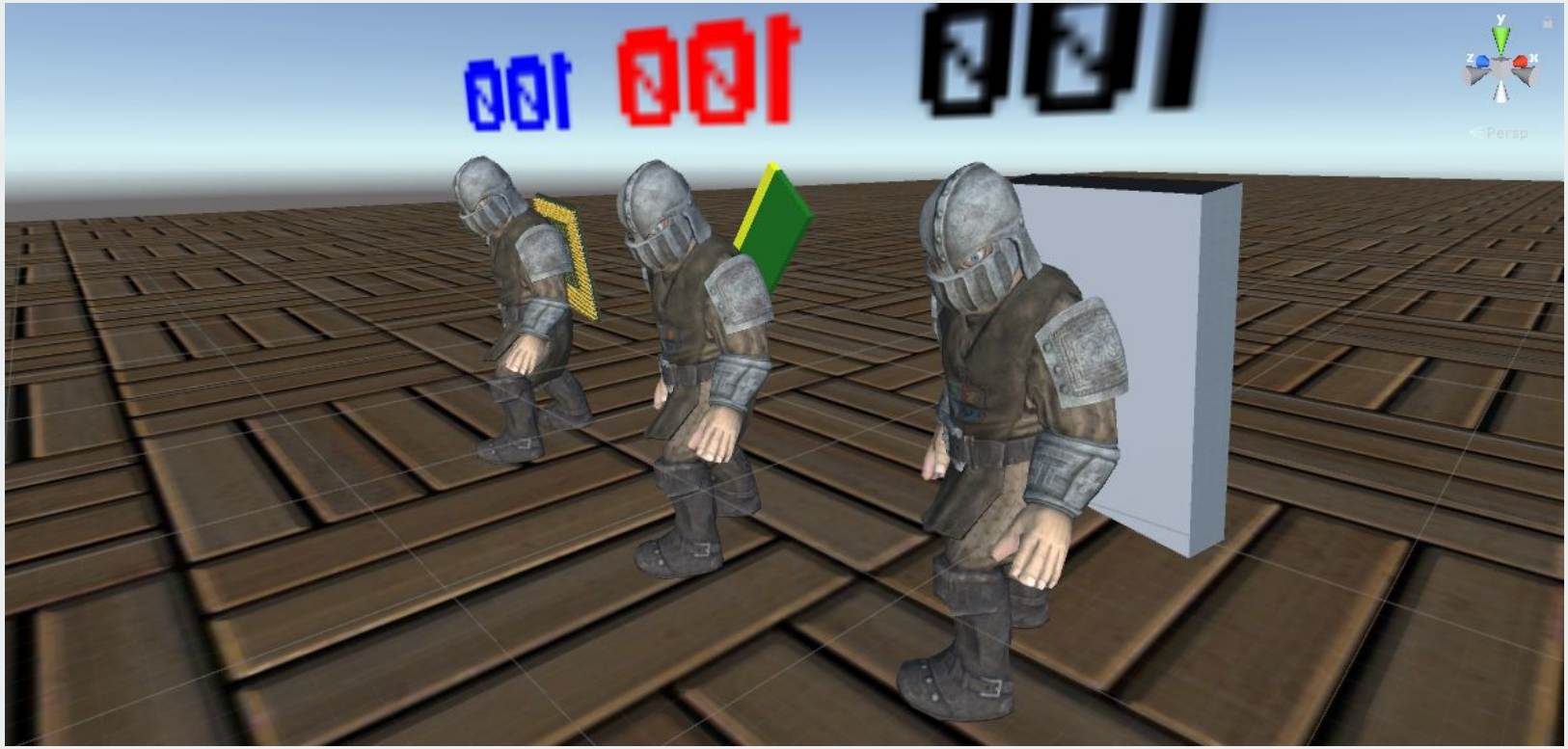
Changes for Future Project

- ➔ Better **project management**
  - ◆ Spreadsheet turns out to be a better tools for tasks management
    - **— Difficult to navigate it around**
    - **+ Have more flexibility to customize it based on the nature of the project**
- ➔ Have **better understanding** of team dynamics from Day 1
  - ◆ **Different people** have **different skill sets**
  - ◆ The earlier team members got to know each other, the better (in terms of assigning tasks, scheduling, etc)

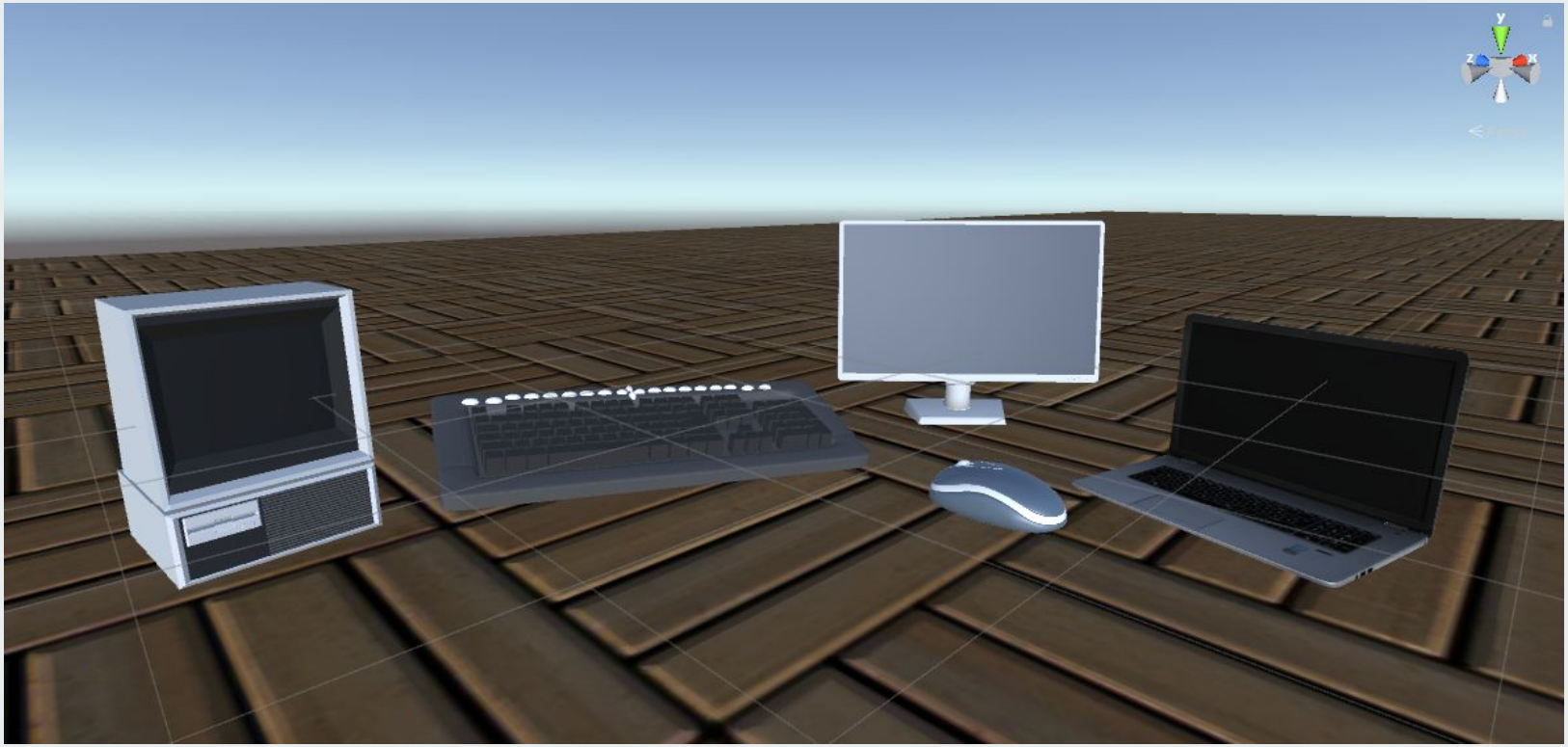
Finished Product



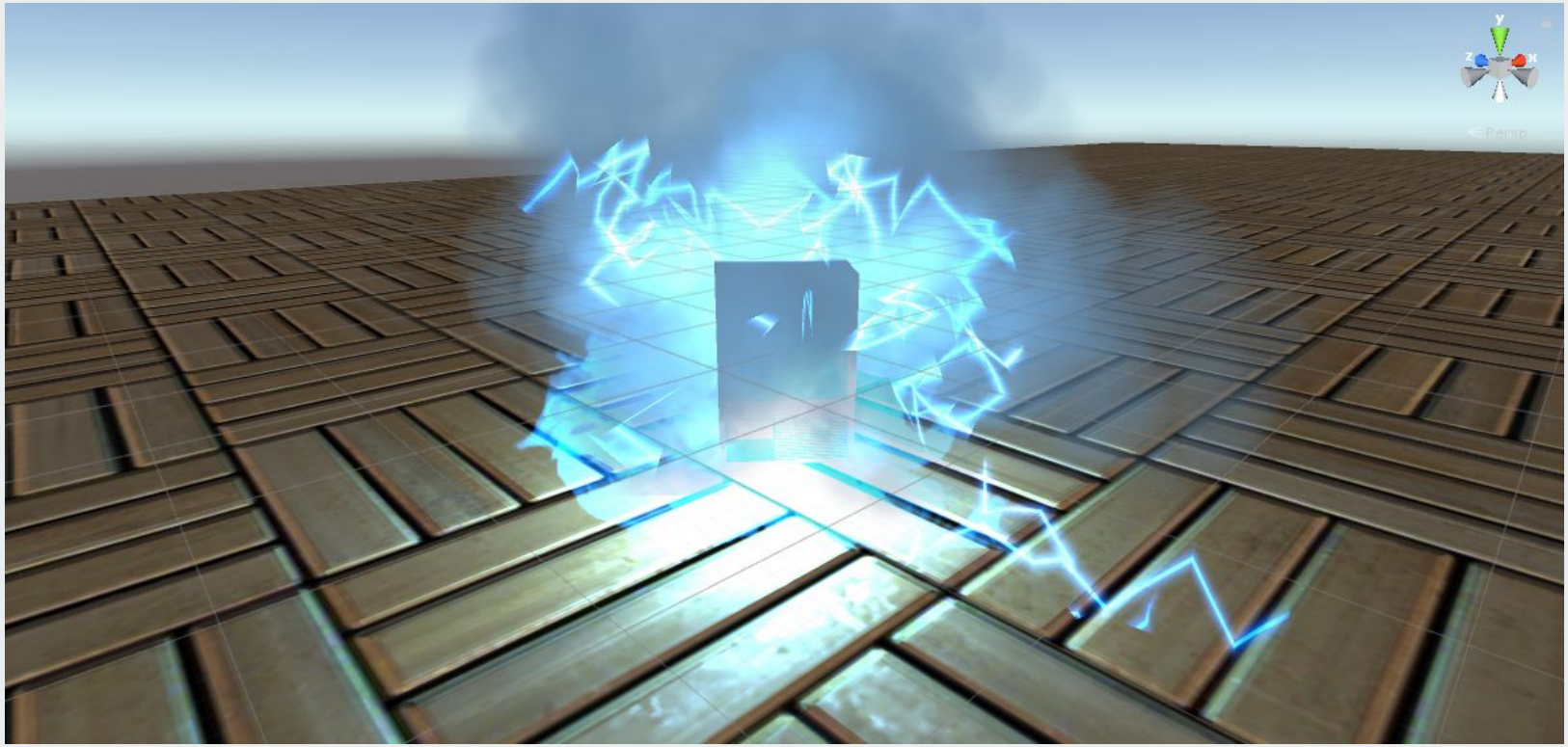
Toons Design



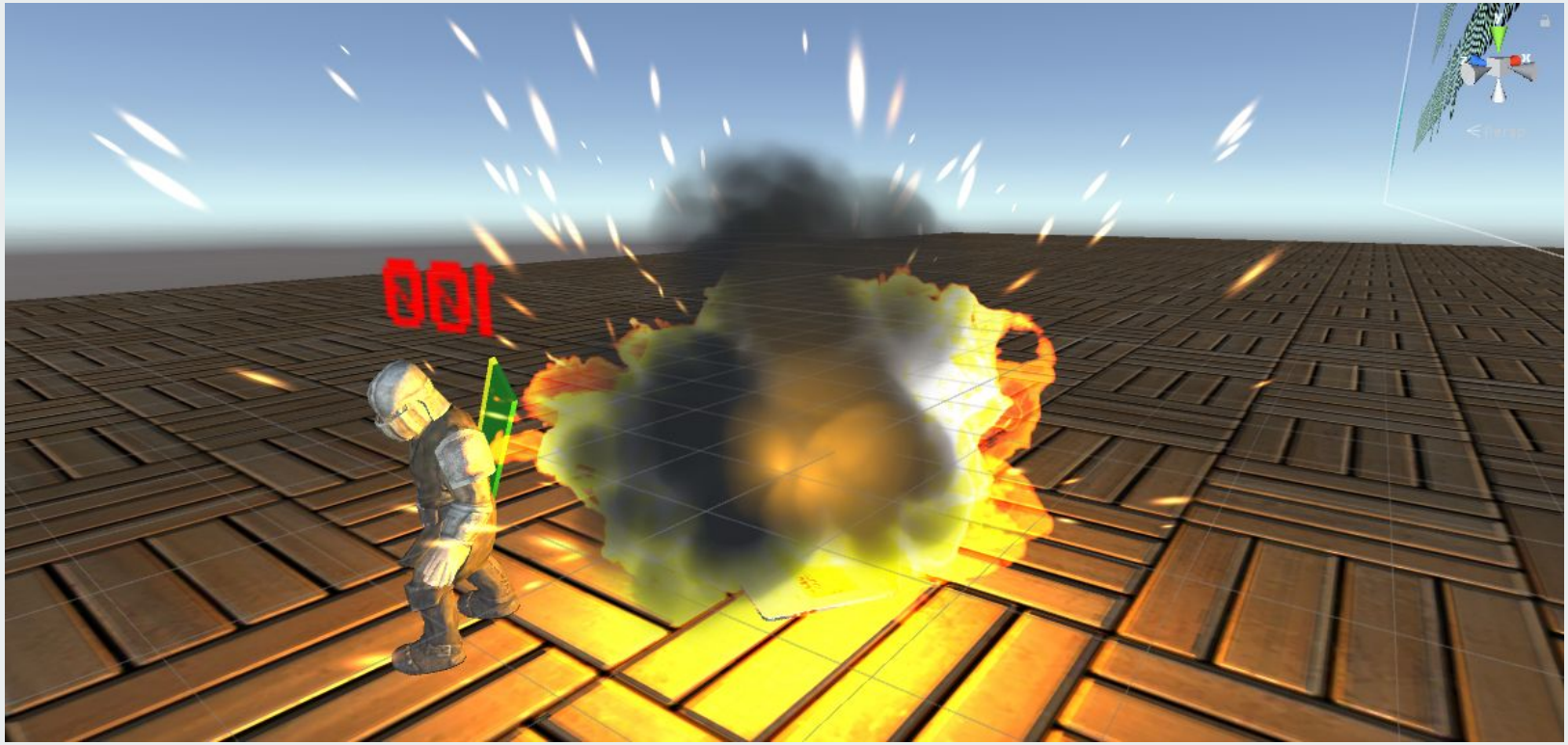
Toons Design



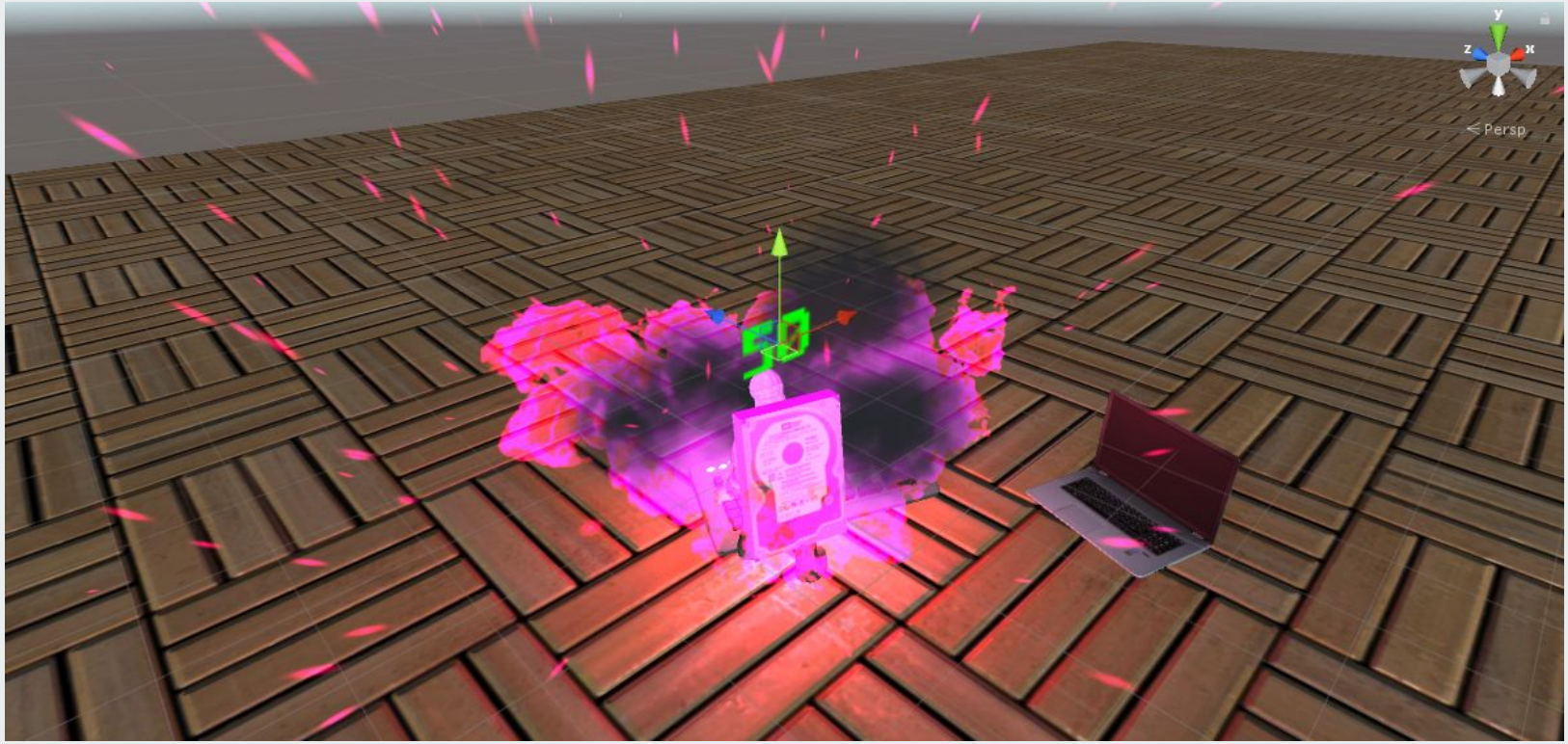
Collectables Design



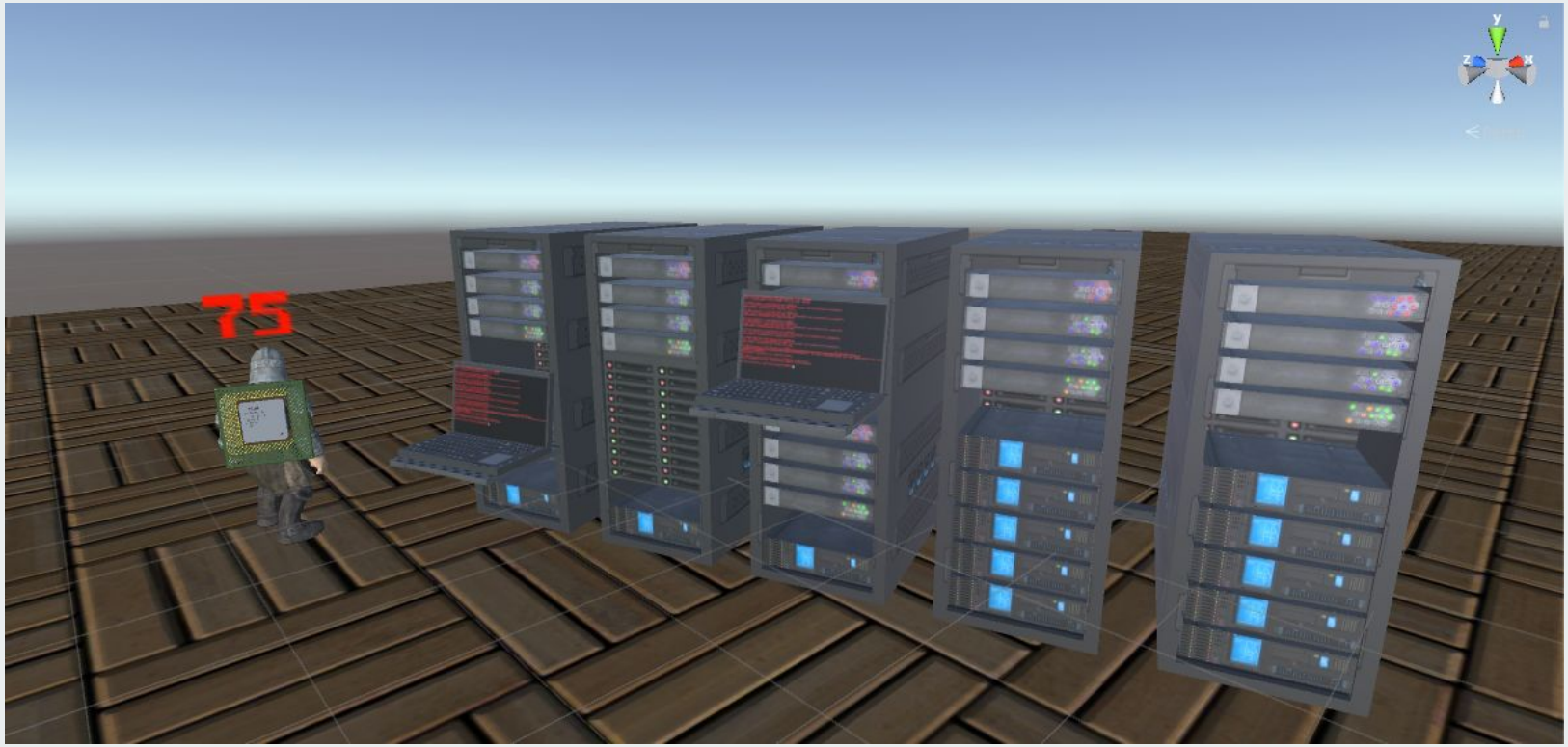
Spawning Effect



Collectables Effect



Bomb Effect



Supercomputer

"Let's get ready to rumble!"

(Game demo coming up..)