Game Concept Document
Operation Tank

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"When you need a tank, you need a tank!"

- LTC Greg Reilly, Commander, First Squadron, Third Armored Cavalry Regiment in Iraq.

Objective

To design, create and release a fully working and tested game for the google-play marketplace tested on numerous android devices.

Overview

The game is currently unnamed,(codenamed "Operation Tank") but will be set in a tank driving scenario in which the objective is to defend a base from incoming enemies whilst avoiding mines laid in the environment.

Core Gameplay Mechanics

Players will be able to control the tank player object around a pre built level seeking out mines and attempting to destroy enemies.

The turret will also be controlled and players will be able to fire an exploding projectile from the barrel.

There will be a 3rd person overview as the main camera and also a switchable camera on the underbelly of the tank for detecting mines("MineCam"). The mines will not be visible in the main camera to add difficulty.

Players must attempt to stop the enemy reaching the base and destroying it. The hit-points of the base are reduced with every hit it receives. If the base is destroyed the level is failed.

Target Platform

The target platform is Android devices.

Project Scope

The project will take around 6-8 weeks from concept to release, including testing and optimisation.

There is currently 1 person (myself) involved in the project, but I am currently seeking out a 3D modeller to assist with asset creation.

I will also seek help from colleagues for testing and general opinions or critique that will help to improve the overall standard of the finished application.

The game will be created mainly using "Unity", however I will use various other applications to help create other assets such as "Audacity" for sound editing, and various office application for supporting documents.

I will use mainly C# code, but also JavaScript as required.

I have already made a basic prototype of the game using Unity to test playability and to see what was possible.

Story and Gameplay

The game is set behind enemy lines in a fictional middle eastern county. The user will control a tank attempting to stop enemies destroying an objective either some sort of fuel depot or outpost depending on the level. The game will become harder as the game progresses with harder and more constant enemies.

The environment is mostly desert and will include some coastal areas as part of level design.

The enemy will have a boss character that taunts the player through the game until there is a "final showdown" at the end.

Characters

The player, will play themselves as the tank driver there will not be a specific separate character or name for the player. I will include a commanding officer or some sort of control centre to help relay orders to the player.

The enemy will consist of soldiers and vehicles attempting to attack the base. I will include a boss character in a final level that will have more hit-points. The "boss" will have a part in the game taunting the player through communications in various levels, leading up to the final level in which the player must defeat the boss type character in order to complete the game.

Levels and Environment

On start-up the game will have a splash screen which leads into a main menu screen.

The **Main Menu** screen will consist of:
- Start A New Game
- Continue Existing Game
- Options
- Credits
- Exit

Start a New Game
This will start a new game from the first tutorial level.

Continue Existing Game
This will give the player to continue the game from where they left it, dependant on if the game was interrupted by another app on the device such as a phone call or if the player has simply quit the application.

Options
I would like to include sound options, and optimisation buttons if this is possible.

Credits
This page will show game credits of designer and anyone that was involved in the production

Exit
Put simply this will terminate the application. This may not be necessary.

Playable Levels

Tutorial
After the player starts a new game they will be taken to a tutorial level where they will have to navigate around a mine field. The mine field will show them the basic movement controls and show the gameplay mechanics to the player. The player will then have to destroy some fuel tanks to complete the level, showing the projectile mechanics. This will be a mountainous desert level. With a fuel depo type area.

Core Levels
There will be between 3-5 core levels in which the player will take on an increasing amount and difficulty of enemies. Again, these levels will be set in the desert. Enemies will spawn from inside a tunnel/or cave with a black texture in front so that the enemies don't just spawn in the middle of the level to create some sort of realism. I will also include coastal areas to add variety, and possibly mix it up with airfield or naval base environments. The level design will be done on a level-by-level basis with each one being individually designed as it is created.

Boss Level
The boss level will be be similar to a core level however once the normal part of this level is completed, in which the player has successfully defended against the waves of enemies the boss will spawn. The boss character will have much more hit points than a standard enemy and be able to do more damage to the players base. Once the boss is defeated the game will be completed and a game completion system will be played. Fireworks and a text will be displayed stating that the game has been completed.

Enemies (in depth)

Soldiers

Soldiers will be the core of the attacking force. They will be weak and not do a lot of damage to the players base. They will require sheer numbers as opposed to doing high one time damage to the base.

They will be modelled on middle eastern insurgent fighters but will not be associated with country, or religion to limit "bad taste". As weapons they will carry guns similar to an AK47 but these will not be fired. The character will simply touch the enemy base and disappear with a explosion or gun shot sound played to simulate the solider entering and firing the weapon or letting off some sort of explosive.

Jeeps and APC's

The next enemy will be a Jeep/APC (armed personnel carrier) it will have more hit-points than the solider but will be less frequent and do more damage. They will not appear in the first level. They will also not fire a weapon but be destroyed as they crash into the enemy base.

Armour

The strongest enemy other than the boss will be a different tank or armoured vehicle that will look different to the player. They will have the highest hit-points but will also move the slowest of all the enemies. They will do a lot of damage if they make contact with the players base and will also explode on impact.

Boss

I will use the existing tank model once it is created for the boss, however I will increase the size and try to add some sort of character model to it to give it an identity that the player can relate to from previous spoken encounters in the game.

Mines

During prototyping I created different types of mines to see what looked affective but what also created a fun aspect. Mines will be the only thing in the game capable of destroying the player. I tested 2 types of mine, the first which exploded and destroyed the player, and the second that flipped the tank into the air. I will use both of these mines in the game and will look at creating more while in the initial stages of creating game assets.

Mines will be scatted throughout the play area and the player must try and avoid these while seeking out the enemy in the level.

The mines will be capable of destroying the player which will restart the current level.

Enemy Spawn

The enemy will spawn from inside a fixed location possibly a cave or building with a covered exit so they do not just appear in the world.

Player

The player will be based ideally on an American Sherman Tank but this may have to change with the availability of 3D models. The player will be able to fire a projectile in order to destroy the enemies, and can be damaged/destroyed by mines. The game character will be able to move around the level area with input from the device. There will be a movable turret.

Assets

2D

Textures
Textures for terrain, player and enemies. Any in scene props will also require textures. These will be sourced or created on a specific item basis, and will be experimented with to find what will go best in the scene and the overall game.

Height Map
I will use height maps as required to save time, dependant on if the specific height maps will work with the environment being made.

3D

Characters

Player
As previously mentioned, ideally the tank will be based on a US Army Sherman, and the mesh must be split correctly between the parts to allow the required movements.

Green Area seperate mesh from main body and turret to allow movment

Red Area seperate mesh from turrent and main body to allow up and down movement

Blue Area is main body mesh and "Tracks" will be static

Enemies

There will be 4 different types of enemies each requiring at least one model depending on availability

Solider
Jeep/Apc
Armour
Boss
Mines

Props
Props will be level specific, and may be expanded on as game progresses, currently includes but not limited to:

- Mine Field Sign
- Rocks
- Trees
- Vegetation
- Oil/Petrol Tank
- Base Building
- Scene Buildings
- Assorted Military Vehicles for the Scene
- Enemy Spawn Building
- Projectile(s)
- Fences
- Concreted Areas
- Terrain Features

Sound

- Player Movement
- Enemy Movement
- Player Weapon Fired
- Player Weapon Impact
- Enemy Destroyed (different for each)
- Mine Explosion(s)
- Player Destroyed
- Base Destroyed
- Enemy Hit on Base
- Boss Destroyed
- Commander Dialogue
- Boss Dialogue
- Scenic Background Sound (distant explosions)
- Background Music
- Menu Music
- Menu Sounds (clicks etc.)

Camera's

I will use 2 cameras in the core part of the project, one will be set up to follow the player and the other will be situated on the underbelly of the tank to allow the player to search for mines. I will use layers with my game objects so the main camera cannot see mines.

Projectiles and Explosions

The playable tank will be able to fire a projectile that requires a basic 3D model and an associated explosion.

Controls and Interface

Controls will be determined during initial prototype and design. I am hoping to control the player with a simple interface that controls 2 sets of tracks on the tank, one on each side . I would like to use the built in gyroscope for turret rotation and add buttons for main menu/pause menu, fire weapon and camera switch.

Basic HUD Concept
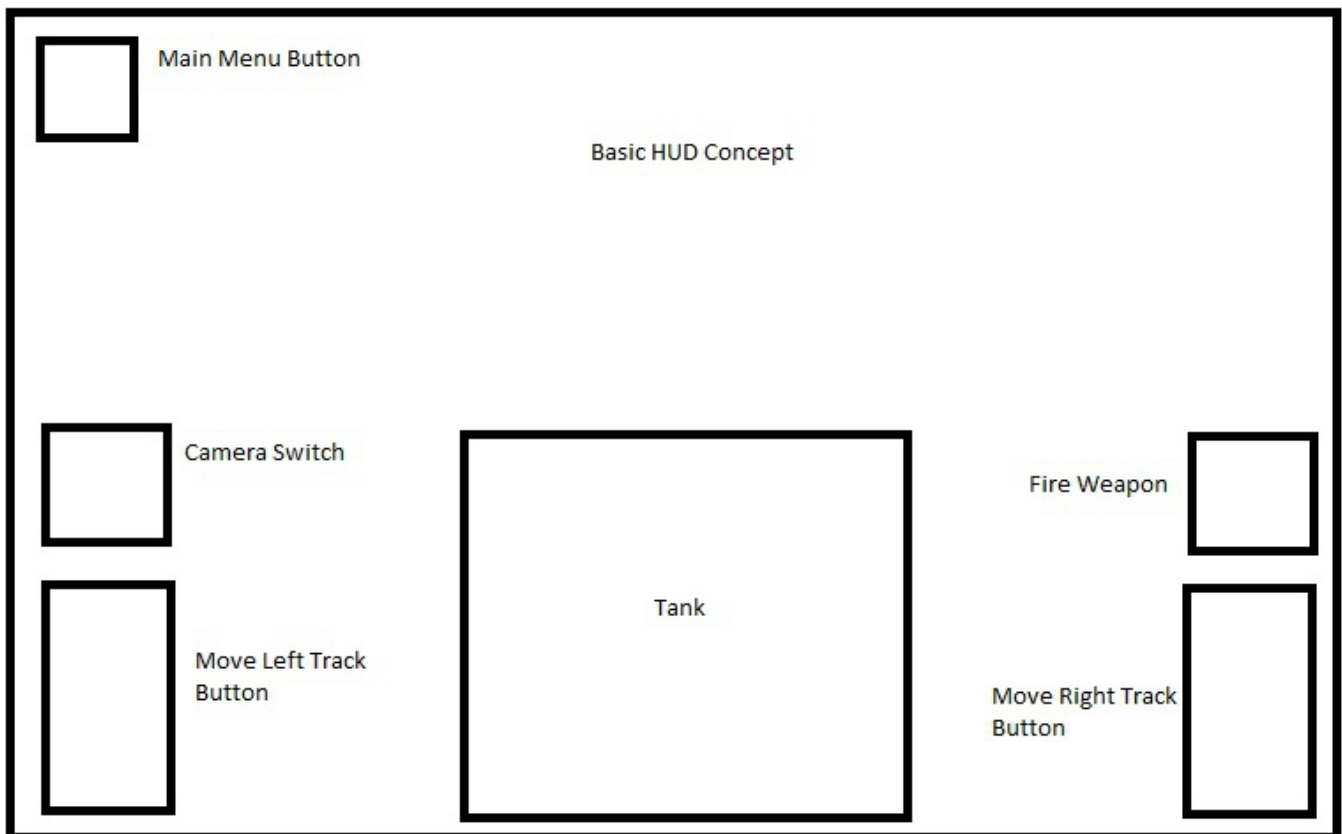
Animation
Currently there is only a basic requirement for animation as most things we be controlled directly using the unity physics engine. However the enemy "solider" will be given some animation as it walks.

Scripts

As previously mentioned the project will be coded/programmed using C# and JavaScript.

Player

Tank Movement

Script for Tank movement will require input from 2 buttons which control left and right side. When pressed individually the tank will rotate. When pressed together the tank will move forward.

Fire Projectile

When the button is pressed a projectile prefab will be instantiated from an empty game object in front of the tank barrel, this will have a force added to it, in order for it to move towards the target. When the projectile hits the target it will explode and reduce hit-points or destroy the object.

Mines

The mines in the game will need to react to the tank coming into contact them to either destroy or damage them, and also be destroyed itself.

Enemy Movement and Spawn

Enemies will spawn in a set position and then be set up to move and destroy the base. They can be destroyed by the player.

Players Base

The base will have set hit-points and once this number reaches zero the base will be destroyed and the level restarted.

Other Scripts

Other scripts will be created as required to add any sound effects and explosions. There will also be scripting for GUI interface and menu's.

Timescale

The project will take 6-8 weeks and the time will be assigned as follows. (Subject to change as necessary)

Week1
- Research
- Proof of Concept (which has been partially done)
- Check resources that are available (can I get a 3d designer?)
- Project Set-up (create folders and sync with SVN repos)

Week 2-3
- Asset creation and core game mechanics including scripting
- Create menu screens and work to assign sounds and explosions

Week 4
- Continue building core section of and finalising all main features including menus and player interface.

Week 5-6
- Bug Fixing and tweaking
- Optimisation for different devices within target platform
- Testing

Week 6-8
- Further Bug Fixing and Optimisation as required
- Adding any extras such as designing logo and writing product description for google-play store
- **Release Game!**

"**Reality is broken. Game designers can fix it.**"
Jane McGonigal