Requirements and Analysis Document for Project “Programmers United Networking Game”

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1 Introduction

1.1 Purpose of application

The purpose of the project is to create a so called “zombie-shooter” game. The game should feature multiplayer over a network with up to four players.

1.2 General characteristics of application

The application will be a PC application consisting of one server and one client portion. The application will have a simple GUI for things done outside of the actual game. The game itself will consist of a 2D gamespace. A player can either join or host a game. Up to four players should be able to join a game on different computers. The application will score the player depending on how well the player does according to the game. The application will end or restart itself when the players lose according to the game rules or the application itself is canceled. There is no situation a player can win, a score is only given when the players have lost. The game will feature a so called map editor allowing players to create their own playable maps. The mapeditor will use a simple GUI.

1.3 Scope of application

“Programming United Network Game” is game in which players must work together to defend a house from hordes of zombies or enemies controlled by the computer. The game takes place in a 2D gamespace to which four players in total can connect and play a game. The game starts when all players are ready and the enemies will start appearing. The players must then aim and shoot at the enemies to destroy them. The wave is ended when all enemies of a wave are destroyed. The game itself, however, only ends when all players are killed by the enemies. The enemies kill the players by getting close to them and attacking them. The players are scored depending on how long they survived and how many enemies they killed. The application will not save save any data from play-sessions.

1.4 Objectives and success criteria of the project

The following objectives determine the success of the project:

- The development of a working client and server for the game
- The design of a working GUI to host and/or join a game
- The design of a 2D gamespace
- The creation of a controllable player
- The creation of enemies controlled by the computer
- The creation of a tool to create maps for the game

1.5 Definitions, acronyms and abbreviations

NPC Non-player character. Game characters not controlled by the players.

AI Artificial Intelligence. The functions that control the enemies.

Host The person or computer who hosts the game. Hosting in this instance means having the server running on the selected computer.

Client A client is the part of the program that connects and talks to the server. A player could be considered a client.

Server Controls most of the of the game's different states. Players can create a server to host their own game or a player can join an existing server to play.

Frame Rate How fast the client updates what it sees on the screen. I.e if the the frame rate is 30 frames per second, the client will redraw the position of the enemies and players thirty time per second.

Sprite The skin of the moving enemy or player.

Enemy Controlled in this case by the computer. The goal in this particular game is to destroy/remove enemies.

Map The board or space where the player and enemies can move around.

Mapeditor A tool for players to create their own maps for the game.

Tile A map is built from tiles. There are different tiles;

- Wall tile; where players cannot move.
- Floor tile; where players are free to move around.
- Spawner tile; where zombies are spawned/created.

Rate of fire How fast bullets are created from a certain gun.

2 Requirements

2.1 Functional requirements

See also:

The player(s) should be able to;

1. Host a new game and select map.
    a) Select map for the game
2. Join a new or ongoing game.
3. Move around with the character on the gameboard.
4. Shoot their weapon.
5. Buy a new weapon

2.2 Non-functional requirements

Possible NA (not applicable).

2.2.1 Usability

The application should be easy to use. A normal user should be able to use the application with some or little computer knowledge.

There should be an english tutorial for both setting up a game, joining a game, how to play the game and how to use the map editor.

2.2.2 Reliability

It is very important that the application is reliable. There should not be regular disconnects from the host/server. A game with all four players should be able to play the game reliably for at least 30 minutes.

2.2.3 Performance

The game should run at a stable framerate and at least over 30 frames per second. The delay between the different clients and server should be kept as low as possible.

2.2.4 Supportability

The application needs to be able to run on any Java-running Operating System. The application has to be usable on a screen with a resolution of 800x600 or more.

2.2.5 Implementation

The application will use the Java environment. All hosts and clients must have JRE installed and configured.

2.2.6 Packaging and installation
NA

2.2.7 Legal
NA

2.3 Application models

2.3.1 Use case model
See appendix for use cases.

2.3.2 Use cases priority

1. Host game
2. Join game
3. Move
4. Shoot
5. Buy weapon

2.3.3 Domain model

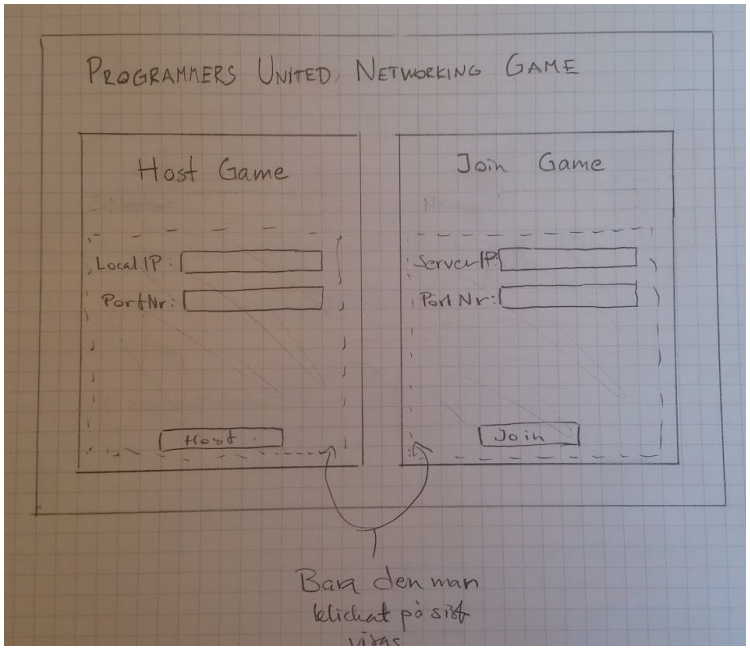
See appendix.

2.3.4 User interface
Application will use separate GUI to launch into game. See appendix for screens.

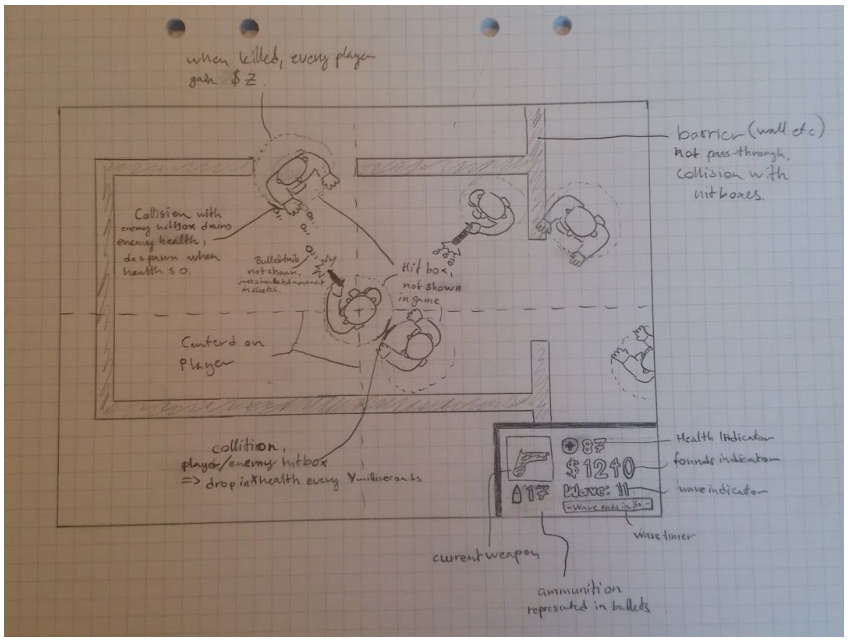
2.4 References

APPENDIX

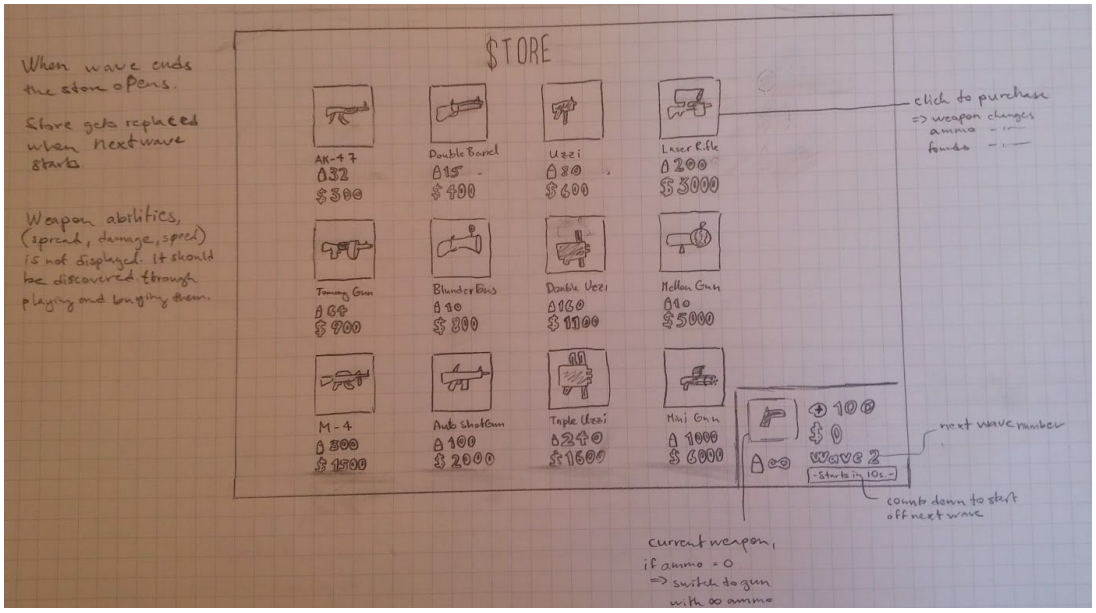
GUI



Initial starting screen

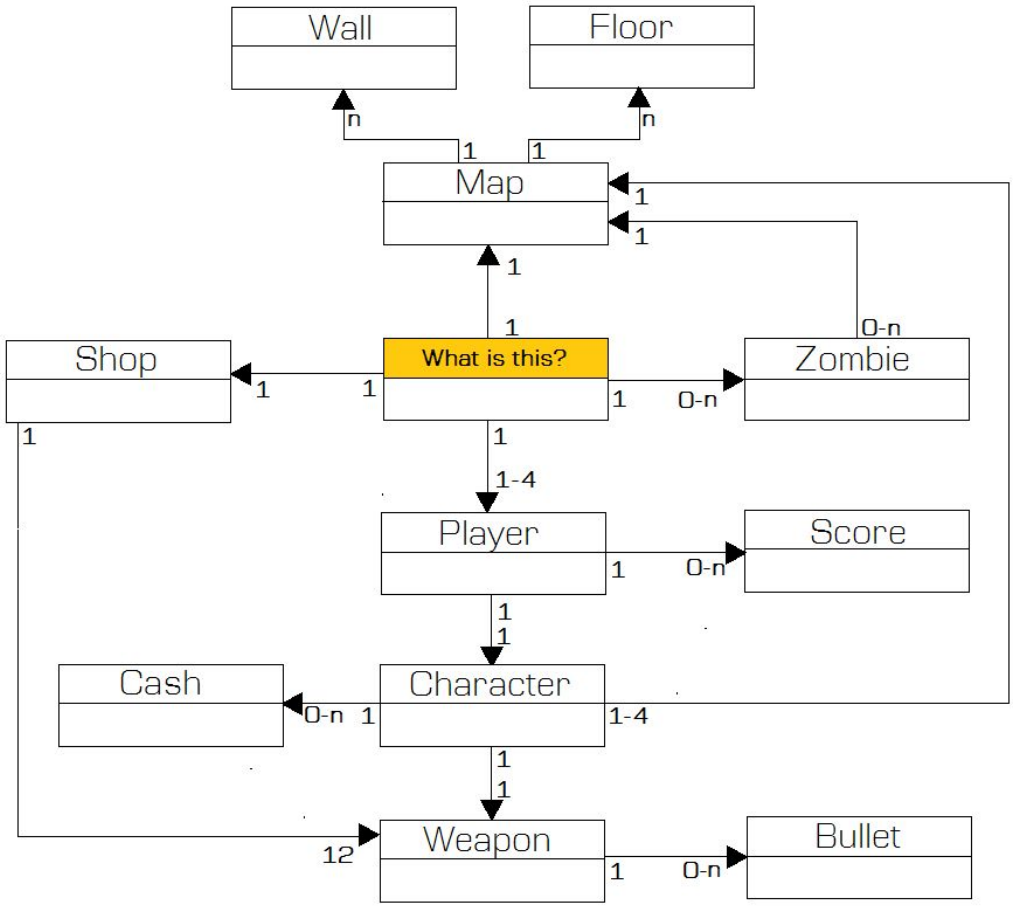


In game view


When wave ends the store opens.
Store gets replaced when next wave starts.
Weapon abilities, (spread, damage, speed) is not displayed. It should be discovered through playing and buying them.
$TORE
AK-47
032
$300
Double Barrel
015
$400
Uzzi
020
$600
Laser Rifle
200
$3000
click to purchase
=> weapon changes
ammo
funds
Tommy Gun
064
$700
Blunderbuss
010
$800
Double Uzzi
160
$1100
Melon Gun
010
$5000
M-4
300
$1500
Auto ShotGun
100
$2000
Triple Uzzi
240
$1600
Mini Gun
1000
$6000
100
$ 0
∞
WAVE 2
Starts in 10s...
next wave number
count down to start off next wave
current weapon,
if ammo = 0
=> switch to gun
with ∞ ammo

Store view

Domain model



Use Cases for Zombienado:

HostGame
JoinGame
RunGame
BuyWeapon
Shoot
Move

Use Case: HostGame
Summary: Player hosts a game which other players can join.
Priority: High
Extends: -
Includes: - RunGame, SelectMap, StartServer
Participators: Actual Players

Normal flow of events:

	Actor	**System**
1	Fills in necessary textfields. Selects map from drop down list.	
2	Clicks "Host" button.	
3		Main menu is closed. Server is started. Game client is started with selected map.

Alternate flow:
No alternate flows

Exceptional flow:
Flow 3.1 Necessary information is not entered or is wrong.

	Actor	**System**
3.1		Game client is not started.

Use Case: JoinGame
Summary: Player joins an existing game
Priority: High
Extends: -
Includes: - RunGame
Participators: Actual Players

Normal flow of events:

	Actor	**System**
1	Fills in necessary textfields.	
2	Clicks "Join" button.	
3		Main menu is closed. Game client is started.

Alternate flow:

Exceptional flow:

Flow 3.1 Necessary information is not entered or is wrong.

	Actor	**System**
3.1		Prompts text is displayed. Prompts player to enter necessary information.

Use Case: RunGame
Summary: Player runs the game
Priority: High
Extends: -
Includes: - BuyWeapon, Shoot, Move
Participators: Actual Players

Normal flow of events:

	Actor	**System**
1	Player joins a game	
2		Game is started. Player characters are enabled. Enemies start to appear.

Alternate flow:
Exceptional flow:

Use Case: BuyWeapon
Summary: A player buying a weapon from in-game store
Priority: Medium
Extends:
Includes: SwitchWeapon
Participators: Actual Players

Normal flow of events:

	Actor	**System**
1	Player clicks purchase button on a weapon in the in-game store	
2		Player switches to selected weapon, Player balance is reduced by the weapon's price

Alternate flows:
Flow 2.1 Player does not afford selected weapon

	Actor	**System**
2.1		Nothing happens

Use Case: Shoot
Summary: Player shoots a weapon which creates a moving projectile.
Priority: High
Extends:
Includes: ZombieHit, SwitchWeapon
Participators: Actual Players

Normal flow of events:

	Actor	**System**
1	Player clicks the shoot button.	
2		Projectile is created. Projectile is given velocity. Shooting sound is played. Player ammo is reduced.
3		Projectile collides with something. Projectile is removed

Alternate flow:
Flow 3.1 Projectile collides with wall or boundary.

	Actor	**System**
3.1		Projectile is removed.

Flow 3.2 Projectile collides with zombie.

	Actor	**System**
3.2		Projectile is removed. Enemy takes damage.

Flow 3.2.1 Enemy's health is below zero

	Actor	**System**
3.2.1.1		Enemy is removed. Score and funds is updated.

Flow 3.2.1.1 Enemy is last enemy on map.

	Actor	**System**
3.2.1.1		Wave is ended.
3.2.1.2		Weapon shop prompt is displayed. 10 second timer is started. See Buy Weapon Use Case

Exceptional flow:

Flow 2.1 Player has no ammo for current gun.

	Actor	**System**
2.1		Player's current weapon is switched to pistol. No projectile is created.

Flow 2.2 Not enough time has gone by since last shot.

	Actor	**System**
2.2		No projectile is created.

Use Case: Move
Summary: Movement of a player or a zombie unit. A game must have started for movement to be enabled.
Priority: High
Extends:
Includes: Collision(ZombieCollide, WallCollide)
Participators: Actual Players, All Zombies

Normal flow of events:

	Actor	**System**
1	Moves unit (with movement keys if player)	
2		Unit is moved in specified direction.

Alternate flows:
Flow 2.1 Player unit moves into zombie:

	Actor	**System**
2.1.1		Player takes damage. Player health is reduced.

Flow 2.1.2 Player unit health is reduced below zero.

	Actor	**System**
2.1.2.1		Death message is shown. Player character is disabled/killed until current wave ends.

Flow 2.1.2.2 All other players are dead

	Actor	**System**
2.1.2.2		Game ends. Score is shown.

Exceptional flows:
Flow 2.2 Unit moves into wall:

	Actor	**System**
2.2.1		Unit doesn’t move in specified direction.

Flow 2.3 Zombie unit moves into another zombie unit

	Actor	**System**
2.2.1		Zombie doesn’t move in specified direction.