



TOWER HOPSCOTCH

Project Sketch

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Table of Contents

1	Starting position	3
2	Idea	3
3	Customer Value	3
4	State of the Art – Competition Analysis	3
5	Main process	3
6	Additional requirements	4
7	Resources	4
8	Risks	4
9	Rough Sketch	5
9.1	Use-Cases:	5
9.2	Risks:	5
9.3	Rough Time Schedule for the Prototype.....	5
10	Economics.....	6
11	Bibliography.....	6

1 Starting position

The market for video games is currently in a continuous state of growth with an estimated increase of almost eight percent in 2017. [1] While many start-ups and small businesses are entering the business to find success, the demand for original and entertaining games is still growing. While all this new content is being released, the strategy game subgenre and its sizeable and enthusiastic fan base finds itself somewhat neglected. We believe that this is something that can and should be changed.

2 Idea

The plan is to develop a tower defence strategy game for desktop PCs. The primary objective will be to defend a central structure over multiple landscapes against waves of enemy units. This is accomplished by building defensive structures to divert, impede and destroy the incoming foes. Each enemy that is stopped will provide the player with a set amount of currency that allows him to further improve his defences.

In our game the player must manage multiple different maps at once, all of which have enemies that move towards the central structure. These maps can be either automatically generated or the player may design his own levels and play on them.

3 Customer Value

- The customer will be provided with an entertaining and unique strategy game with multiple original twists.
- The game will run all major operating systems that support a Java environment.
- It will feature increased challenge by having the player manage multiple maps at once.
- The customer will be able to choose to create his own unique maps for improved replayability and enjoyment.

4 State of the Art – Competition Analysis

There are many tower defense games which gained much popularity over the years. The most successful game released 2009 and is still a name people know: Plants vs. Zombies. [2] It uses a small n by m grid where the enemies approach from one side and the “towers” are placed on the grid to fight against them. The enemies can destroy the towers when they’re near enough. Killed enemies give the player money to upgrade or place new towers.

5 Main process

The main process is the player who plays the game

- The player starts the game, which he already has installed.
- He selects the standard mode.
- The player receives a specific amount of game currency.
- The player spends the money to place towers.
- The enemies are coming in waves.

- The towers try to shoot down the enemies.
- A tower kills an enemy and the player receives money, which he can spend again on towers.
- An enemy reaches the players base and the base loses some health points.
- The player survives all waves and wins the game.

6 Additional requirements

- The game should run with at least 30 frames per second even on low end PC's.
- The GUI will be touch friendly.
- The language will be English.
- The first release will only be for PC.

7 Resources

The most important resource required for the project is a team of 4 members. Everyone must be experienced in Java and the architecture around it. Each one of us brings at least 1 year of experience in Java to the table, which is a good foundation to build upon. 2 party members have worked on games in Java before and are experienced enough to support the other members if necessary.

Dependent on the graphical user interface and its complexity, we might need some external know how or at least enough time to work ourselves into the subject.

Based on our experience and the time provided by the PSIT3 teachers, our estimate would be that we need about 100-120 h per person to get this project done (guess based on "Information-Blatt Modul PSIT3")

8 Risks

The video game business is highly competitive and hard-fought. A considerable risk is that our game could go under the radar and be missed by the audience, which would cause sales to plummet.

Developing games is not easy. A small logical mistake could cause a lot of bugs or unpredictable behaviors. Fixing a multilayered problem with a lot of dependencies can quickly escalate and break the budget in terms of time and money.

A visually unappealing graphical user interface can most certainly scare off costumers. We need to make sure that our product appeals to a broad audience.

9 Rough Sketch

The time required to finish the product is estimated to be 18 months whereas the prototype's time schedule is set to be finished within 14 weeks. Within these 14 weeks the prototype will be built according to the Unified Process(UP) and each week represents an iteration. A first analysis yielded the following Use-Cases:

9.1 Use-Cases:

1. Playing a variable number of rounds of the tower defense game with multiple enemy types and tower types. This includes the following Sub-Use-Cases:
 - a. Placing affordable towers on the map
 - b. Upgrading existing towers if affordable
 - c. Tearing down towers
 - d. Pause the running game
2. Loading a map in the game and playing it according to UC 1.
3. Exporting existing maps for editing via spreadsheet editors.

9.2 Risks:

- Complexity of development exceeding expectations – resulting in more time-consuming effort.

9.3 Rough Time Schedule for the Prototype

The development of the prototype will require an estimated 480 hours which should be reached by weekly iterations according to the following time schedule:

Phase	Iteration	Start / [weeks]	Duration	Objective
Inception	1	1 / 2		Project sketch finished, IDE prepared, UC identified, Architecture determined
Milestone	M1	End of Week 2		Requirements for product determined
Elaboration	2	3 / 2		Detailed formulation of UC 1-3, Domain model defined
	3	5 / 2		UI prototype defined, Architecture stable and as PoC verified
Milestone	M2	End of week 6		Architecture verified
Construction	4	7 / 2		UC 2-3 implemented and tested, UI prototype implemented
	5	9 / 2		Implementing UC 1 and UI
	6	11 / 2		UC 1 implemented and tested, UI finished, Integration tests finished
	7	13 / 2		Cushion
Milestone	M3	End of week 14		Product finished, System tests finished, Documentation finished

10 Economics

We'll each work for 120 hours, which accumulates to a 480 hours project. Our goal is to pay ourselves about 40 francs per working hour. Together with the marketing campaign and a reasonable time buffer for testing and unexpected bug issues or changes, the project will cost about 35'000 francs.

The game will be sold on Steam (biggest online video game store) for 10 francs. Which means that at least 3500 copies need to be sold to break even. Steam has a multi-million audience and is a great platform to sell games on. We estimate to break even after about 4 months.

The first year will probably be the most successful, because the typical gamer craves innovation and new experiences. A 50% decrease in sales per year is a realistic vantage point. After 5 years, the estimated income will be around 220'000 francs minus the first investment.

11 Bibliography

- [1] E. McDonald, "NEWZOO," 20 April 2017. [Online]. Available: <https://newzoo.com/insights/articles/the-global-games-market-will-reach-108-9-billion-in-2017-with-mobile-taking-42/>.
- [2] EA. [Online]. Available: <https://www.ea.com/en-gb/games/plants-vs-zombies/plants-vs-zombies-2>. [Zugriff am 02 10 2017].