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Software Testing

Test plan project

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# 1.INTRODUCTION

This test plan is being developed for Game Development International Ltd. They have created a new game created with 2D sprites and animations and the background being converted to pixel art sprites and the concept is similar to well-known games such as Sonic the Hedgehog or Donkey Kong which use horizontal scrolling techniques and want a test plan document for it. The character which is a wizard will go through the levels which get more advanced after each one you complete. The wizard has health which can be lost if you get attacked by the enemies and if the wizard attacks and kills the enemies he progresses. The wizard will be able to regain some health in certain parts of the levels. This game can be played on PC and on a mobile device.

# 2.0 OBJECTIVES AND TASKS

## 2.1 OBJECTIVES

The objectives are to test every aspect of the game, its functionality, and its flow. The aim is to find as many software defects as possible to make sure the game is bug free before its released. There will be a service legal agreement document upload.

## 2.2 TASKS

Tasks include the following:

* Unit Testing
* SIT (System Integration Testing)
* Performance Testing
* Stress Testing
* User Acceptance Testing

# 3.0 SCOPE

## 3.1 GENERAL

The game is being tested as shown above in objectives and tasks. The plan is being made to carry out a thorough and professional test plan. All the tests will be completed in a 4-week period where we will devote a day to carry out certain functions. This is to ensure a good and extensive test of this game for its final release to the customers. The tests will be carried out with patience and as if a user would be trying the game for the first time. We want to ensure that the game is of a high quality with no bugs or issues and it flows well, as well as it is easy to understand the game controls. All the buttons will be tested well, all the in-game assets such as health, enemies, and the boss will be tested.

## 3.2 TACTICS

The objectives and tasks will be accomplished on a schedule as stated above. We plan to test all aspects in an organised fashion and to notify a representative of Game Development International Ltd promptly to arrange a meeting and present them with our findings and input.

# 4.0 TESTING STRATEGY

Testing strategy is vital for a successful test case. It is important to maintain a consistent and efficient strategy to get the best and correct results. All features will have a specific timeframe for testing and will be tested in the best possible way. The activities will be documented at the highest level and thoroughly tested. As stated, before each task will have a specific timeframe according to its importance in the overall game.

## 4.1 UNIT TESTING

**Definition**:

Unit testing is when you test the smallest piece of a verifiable software in the application. In the case of this game it could be a certain function to make the character go forward or backwards. Unit testing is going deeper into smaller aspects of the application and testing each part. Unit testing validates each unit of the game works as it was intended. It should have inputs and one output.

Some advantages of unit testing:

* Reduces defects in new code, reduces bugs when fixing functionality
* Reduces cost of testing because defects are found early on
* Improves design and allows better refactoring of code

Unit Testing Techniques:

Black Box Testing – Input and output are tested

White Box Testing – Tests which one of those functions’ behaviour is tested

Gray Box Testing – To Execute tests, risks, and assessment methods

**Participants**: The role of unit testing is done by John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear in the development side of the game. This makes things clearer for them rather than any other department doing it.

**Methodology**: Unit testing will be conducted by the development department and there will be many tests to be carried out including, code for the horizontal scroll, it’s important that that works without any faults, tests of every aspect of the movement of the characters in the game as well as the functionality of the health system implemented. The test scripts are usually conducted by the development team as well. The sequence will be tested as the game progresses, as stated above in objectives and tasks, we plan to test it thoroughly and at one stage at a time to make sure it is in the best possible condition come the release of the game.

## 4.2 SYSTEM AND INTEGRATION TESTING

**Definition**:

System and integration testing, better known as software testing, carried out in an integrated hardware and software environment to verify the behaviour of the complete system.

It deals with the verification of high and low-level software requirements in the specification of the software design document.

SIT helps:

* detect problems early
* correct timing
* earlier feedback

**Participants**:

This role can be shared with some developers such as John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear but mainly it is the testers such as Hannah Watts and Yana Hillary who do most of the SIT.

**Methodology**:

SIT will help with the integration of the software and hardware side of things and will make sure that the defects are found early which makes it easier to fix the issues. The testers will write the scripts and the events will be sequenced as they are needed. Everything will have its allocated time to be tested and completed.

## 4.3 PERFORMANCE AND STRESS TESTING

**Definition:**

**Performance Testing:** Tests the software to establish the systems performance including its stability under a workload, reactiveness, and sensitivity.

**Stress Testing:** This verifies the stability and reliability of the system. This then establishes the robustness and error handling under heavy load conditions.

**Participants**: The testers such as Hannah Watts and Yana Hillary would be responsible for doing these tests because they will try push the game to the limit and determine whether it will break. This will prove whether the game is reliable and sustainable to high level workloads.

**Methodology**:

Performance and stress testing will be conducted with the highest level by our testers. Testers would make sure to overload the game and continue to test its reliability and how it responds to a high workload. Testers want to push the game to the limit, so the developers get a better insight on how it all reacts. Testers will write the scripts and testing will be sequential according to its importance.

## 4.4 USER ACCEPTANCE TESTING

**Definition:**

User Acceptance or end-user testing is testing the software by the user or client to establish whether it can be accepted or not. This testing is done after the functional, system and regression testing is completed.

**Participants**:

The participants are the end user department – Tammy Woo, Lionel Richie, and Vera Williams, they are experts in this field and know all about business requirements.

**Methodology:**

The end-user testers will test all aspects of the game and make sure it is in line with the business requirements, they then make up reports of what they think worked well and what didn’t, if it met all the requirements from the business plan. This testing is completed once all the other tests have been processed. This testing is a big part of the strategy because they will inform the developers about anything they find while playing and testing the game.

# 5.0 TEST SCHEDULE

The full testing period is aimed to be 4 weeks.

First its Unit Testing. Unit testing is explained above in section 4.1. The testers for unit testing are John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear. They will be testing for the first week, giving thorough tests for each unit over this period to make sure every unit is tested to the highest quality.

Next up is SIT (System Integration Testing). SIT is also explained above in section 4.2 and will be performed by as John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear but mainly it is the testers such as Hannah Watts and Yana Hillary. They will be testing the system integration on the second week, again at the highest level to find bugs early and fix them so the game is ready for the next phase.

Then we have Performance and Stress Testing. Performance and Stress testing is explained in section 4.3 and is going to be tested by Hannah Watts and Yana Hillary and their team of testers. They will be carrying out these tests on the third week trying to max out the usability of the game and getting a good understanding of how it performs during extreme conditions.

Finally, User Acceptance Testing. This is a very important part of the Schedule as it is the end-user section which is performed by Tammy Woo, Lionel Richie, and Vera Williams. They are experts in their field as explain in section 4.4. They will determine and report back with feedback on how they feel the game works and does it meet the initial business requirements.

Each milestone must be met and should be completed in the time allocated. This ensures complete professionalism and makes sure the launch of the game is a success.

The tests can be carried out in their offices using their computers and mobiles as it is a computer and mobile based game.

A screenshot of a cell phone

Description automatically generated

A quick Gantt Chart illustration of the schedule for testing.

# 6.0 CONTROL PROCEDURES

## 6.1 PROBLEM REPORTING

As this testing process is so important and we want to have it at the highest level, any slight issue must be reported. While doing each part of testing, no matter how small. The tester carrying out the procedure must complete a problem form. This form must be detailed with the time it happened, what the cause could be and which platform it occurred in. The person testing then emails it onto the review department for them to send onto the department which oversees fixing the issue.

## 6.2 CHANGE REQUESTS

If there are any changes to the software’s, the project manager Robert Savage decides and signs off on any of the changes. No changes to the current plan should be made unless it is extremely necessary. All major decisions are reported to the project manager.

# 7.0 FEATURES TO BE TESTED

Testing list:

• Start-up menu, Play, Settings, Load Game, Delete, Exit Game

Play should take the player to level one

Settings should allow the player edit game settings such as sound, music.

Load Game should allow the player to load the last stage of the game they left on

Delete Game should delete any saved stages

Exit Game should allow you to quit and leave the game

• In game menus, includes options when the game is paused.

The player should be able to pause, resume the game as well as some of the options available in the start-up menu such as settings and exit game.

There is a Save Game option which allows the player to save the game at the current stage that they are in and later be able to continue where they left off by selecting the load game option in the start menu.

• Control Mechanisms, move forward, move backwards, jump, crouch, attack, pause/resume

On the Mobile all the controls are on the screen, there will be arrows to move and a crouch button and an attack button.

The Pause/Resume button will have a button on the top right of the screen.

All these controls will be tested and documented if there are any issues.

Move forward (PC) is either the right arrow or the D key.

Move Backwards (PC) is either left arrow or A key

Jump (PC) is either Up arrow or W key

Crouch is C key

Attack is Left mouse click or R key

Pause/Resume is spacebar

All these controls will be tested and documented if there are any issues.

• Game play

Once the player opens the game, they should get a menu that has three options, Play, settings and exit game. The player should then be able to click play and it should load the first level and it should start the game straight away. Once the level begins the player can go through the level and when they have completed the first level it should load the second level.

In the beginning of the first level, a pop up will appear to show the player the controls of the game. The game has three levels which increase in difficulty once you complete them. The difficulty should be from different aspects such as having more enemies show up, or more health for the enemies which makes it harder to kill them.

Once the player completes the levels, they should be given the option to start again or quit the game or if they choose settings, they could adjust the sound. The exit game option should close the game.

All these factors of the game will be thoroughly tested and the testing will also include verifying if the graphics of the characters aren’t bugging or if the pixels are at the right settings, as well as if the game flows well, the horizontal scroll.

The goal is to make sure all this functions at the best level and to find any bugs with any of these features. The game should be easy to understand and instructions on how to play should be clear. This will also be tested.

# 9.0 RESOURCES/ROLES & RESPONSIBILITIES

Team lead/Project Manager – Robert Savage – in charge of the whole operation and all major decisions regarding the game.

Unit Testing -Developers: John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear – They test and report the issues as well as their developing side.

SIT (System Integration Testing) - John Dollery, Adel Hernandez, Timothy Brown, Valencia Monclear but mainly it is the testers such as Hannah Watts and Yana Hillary – They carry out this testing and reporting

Performance/Stress Testing - Hannah Watts and Yana Hillary and their team of testers – they do the stress testing and reporting

User Acceptance Testing - Tammy Woo, Lionel Richie, and Vera Williams – they oversee reporting and the business requirements, they work hand in hand with the team lead.

# 10.0 SCHEDULES

Test Plan/Test Case – Approval on 14th of May 2020

Scripts to be written before that date.

Incident reports should be logged after 1 Day

Test Summary reports by 14th of June 2020

# 11.0 RISKS/ASSUMPTIONS

**Risk**: Delays

**Possibility**: Low

**Plan**: If there are any delays to one part of testing, we would have to cut one of the other testing phases short or add longer hours to our workers testing it. We also have back up testers to help.

**Risk**: System Crash

**Possibility**: Medium

**Plan:** We have backups of backups of everything in the system, so we plan to just carry on using a different backup

**Risk**: Staff shortage or sick days

**Possibility**: Medium

**Plan**: We have backup part time staff to help us in case of absences.

**Risk**: Malfunctions

**Possibility:** High

**Plan**: We will have backups for all hardware malfunctions, as well as maintenance to avoid such issues.

Our strategy is to always expect the unexpected so this way it keeps us on our toes and ready for anything. We have backups and many plans including risk management plans. We plan to stay on course to have a release before the start of July and have all testing finished by 14th of June.

12.0 TOOLS

As we are going to be spending a lot of time testing, we made some research on some tools we could use for testing. We found some interesting automation tools as well as bug tracking tools.

Here is a list of the automation tools we would be using for testing this game.

* Leapwork
* Ranorex
* Selenium
* Robot Framework

Here is a list of the bug tracking tools we are going to be using.

* Redmine
* Plutora
* Mantis
* Bugzila

13.0 REFERENCES

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