**Dirt Bike Racer**

**Problem Statement**

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# 1 Executive Summary

The purpose of this document is to describe the overall idea of this project. The contents include a high level problem summary, detailed problem statement, and key stakeholders. This document gives a quick insight into the lack of a centralized database for finding activities to accomplish on your bucket list and our proposed solution to the problem.

# 2 Introduction

This document introduces the concept of the Dirt bike racer game. This will serve to introduce project scope, criteria for a successful project, a detailed view of the problem statement, and our thoughts on the market and future for an idea like ours.

Dirt Bike Racer is a game on a two dimensional plane, where players control the speed and tilt of a bike. The goal is simple; Make it across the finish line without crashing. With several different levels with several variations in terrain, players will be challenged to even finish the game.

# 3 High Level Problem Summary

3.1 Elevator Statement

Dirt Bike Racer is a two dimensional dirt bike racing game that allows the user to traverse through a pre-designed level, overcoming obstacles along the way to reach the finish line in the quickest time possible without destroying your character or dirt bike along the way.

3.2 Primary Success Criteria

The primary goal of this game is to create a multi-lingual, fun to play, and test-driven developed game that will be playable by multiple users. This includes means that the user will be able to control an avatar with keyboard commands, play through at least five different level designs, and be able to distinguish total time played on each level and overall throughout the game.

3.3 Scope

3.3.1 Within Scope

1. Title Screen to introduce the game
2. A Main Menu to start the game
3. A minimum of five distinct levels
4. An avatar that is represented by a dirt bike with a rider
5. The ability to maneuver obstacles using arrow key shortcuts
6. A win state, fail state, level select state, and game complete state
7. Level progression within a single session
8. Timer to keep track of time spent on each level and time spent overall on all levels

3.3.2 Outside Scope

1. Saving game states through multiple sessions
2. Web based functionality
3. Creating and Editing Levels
4. Multiple users playing at one time
5. Avatar customization

# 4 Detailed Problem Statement

4.1 Function

4.1.1 Basic Function

* The ability for the player to start the game and choose a level
* Player can finish level or quit at any time
* Player can control bike with two different inputs
* Time of each level session is tracked
* Best time for each level is tracked
* Overall sum of all times is tracked

4.1.2 Extended Function

* Player can control boost of bike with third input
* Player can fill boost by doing tricks
* A.I controlled players
* Random level generator
* Additional level types
  + Race
  + Survival

4.1.3 Business Features

* The ability for the player to start the game and choose a level
* Player can finish level or quit at any time
* Player can control bike with two different inputs
* Time of each level session is tracked
* Best time for each level is tracked
* Overall sum of all times is tracked

4.1.4 Enabling Features

* Game only exits when player quits the game
* Game runs smoothly

4.1.5 Concurrency Issues

The only time when multiple processes will be running is when the game is actually running. This will mean user input, the graphical interface, time, physics, and win game state detection must all be running at the same time.

4.2 Form

4.2.1 Availability

* Stored on local computer

4.2.2 Usability

* Easy to navigate menu
* Simple controls using the arrow keys and space bar
* English and Spanish

4.2.3 Performance

* Should not crash in the middle of a level
* One user
* Accurately measure and record time to beat level
* Run smoothly after sustained times of play

4.2.4 Security

* Users should not be able to hack in any way
* No access to source code by the user

4.2.5 Maintainability

* Software should be self sufficient
* Developers can add more levels or features in the future

4.2.6 Testability

* Easy to break down for unit testing
* Many classes and methods
* Tests of terrain interaction, different key movements, and may more possibilities

4.3 Economy

4.3.1 Business Context

There are currently similar games in the market, but most of them are web-based. This product will allow users to play the game locally without relying on an internet connection.

4.3.2 Customer Organization Constraints

The menu will be limited to English and Spanish. Other than that, the only limitation will be access to get the game downloaded onto a computer.

4.3.3 Development Organization Constraints

Some additional features could be too complicated for the current programming skills of the developers. However, these features could be implemented in the future. Also, the developers have very busy schedules and could have trouble putting a lot of time into the product.

4.3.4 Key Risks and Uncertainty

The main uncertainty is the amount of time the developers will have to work on the product. While the product should be completed, it may not be as sophisticated as desired, which would decrease user interest in the product.

**4.4 Time**

4.4.1 Historical

The first two dimensional bike racing game was Excitebike for the Nintendo Entertainment System. It was the first game of its kind. The player could race alone or with other riders. Players could control their speed and position on the track, as well as the pitch of the bike, while in the air. There were 10 tracks to choose from and 2 different game modes. Additional features include the saving of the best time for each track and a track designer.

4.4.2 Current

Currently there are several different kind of two dimensional bike racing games. Many of them are web based flash games that users can play for free through their interent browsers. There are a handful of console based bike games as well, the most notably for which is Trials HD. This is a 2.5D puzzle/racing game uses 3d graphics but the player only controls the bike over a two dimensional game. The game has several different levels that challenge the player to overcome obstacles to finish. Players can connect with their friends online to compare times on each tracks and compete for the best time.

4.4.3 Future

The future of this niche genre is good. Trials Evolution, the sequel to Trials HD, is set to release early 2012 with even more levels and an extremely extensive level editor. The new game also experiments with a variety of different game types within the two dimensional bike gameplay limitations. Also, with the sudden increase in mobile gaming technology, this genre will find its way onto mobile phones and gaming platforms where the short level size is perfect for the mobile gaming market.

# 5 Key Stakeholders

|  |  |
| --- | --- |
| **Name** | **Role** |
| Sriram Mohan | Project Advisor |
| Tyler Shelton | Project Team |
| Matthew Spurr | Project Team |
| Jacob Schuenke | Project Team |
| John Smith | End User |
| Bill Bob | Administrator |
| Geoffrey Ong | Technician |

# 6 References

<http://en.wikipedia.org/wiki/Excitebike>

<http://en.wikipedia.org/wiki/Trials_HD>

<http://www.redlynx.com/trials-evolution>

# 7 Version Information

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| --- | --- | --- |
| **Version** | **Comments** | **Date** |
| 1.0 | Initial Draft | January 12, 2012 |