2D Side-Scrolling Puzzle/Platformer Game

Ne+

(Neon Plus)

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# Introduction

The purpose of this project is to design and implement a 2D sidescrolling video game with an A.I. component, post-processing and music-driven effects, and a stimulating component management system that allows game objects to combine graphical and data-driven effects to provide a dynamic end-result for the user. The main feature of the game will be a system in which players manipulate various inputs in the form of lights and waves to create pathways and solutions to obstructions blocking the way forward.

As a simple example, a character is unable to cross a chasm without assistance, so the character directs a certain colored light toward the chasm, which projects a platform that can be used to cross it. To add to the example, a game object emitting waves darkens the light platform, making it disappear as the waves pass it, so the player must cross at the appropriate time when no waves are obstructing the platform. This adds challenge, dynamic gameplay, and a stimulating visual component to the game. There will be many different lights with many different effects, all of which can be combined in new and interesting ways that the player must experiment with.

The market for this game is those who enjoy simple, yet mind-bending indie game experiences as has become a trend.

The game objects will be primarily bright neon colors in the style of Geometry Wars, and most game objects will be drawn utilizing particle and post-processing effects to emphasize glow and lighting. The game objects will also vary in lighting and effects according to the game’s soundtrack, and certain game objects will contribute to the sounds that are playing and will be affected by what the player is doing. In this way a dynamic soundtrack will be created, while still maintaining a core structure.

The end goal of the project is to be released in open-source format, with Windows 7 and Xbox 360 as the target platforms, and possibly distributed through digital distribution platforms on the PC. I am the only stakeholder, and everyone who enjoys adventure games should benefit from this project.

## Project Goal Statement

I will design and implement a sidescrolling 2D video game utilizing dynamic game objects, A.I., and music-driven post-processing before senior year’s end.

## Major Features or Objectives

### Effective Entertainment

Customers interested in video games play for the purpose of occupying time while enjoying themselves. Therefore, a main objective of this project is to provide effective entertainment that will provide customers with enjoyment. If this objective is not met the project is a failure, which makes it the single most important objective.

### Innovative Gameplay (Stimulating Game Object Interaction)

Customers interested in video games are interested in effective innovation that drives the video game format to new and enjoyable experiences. The interaction between the different game objects, which all combine to create dynamic visuals and levels, will stimulate the player and keep things interesting. This feature is simultaneously manageable for a single developer as it focuses on gameplay as opposed to content. Because it pulls together gameplay, visuals, and audio, it is a sufficiently complex system that requires an elegant solution to implement.

### High-Quality Visuals

The visuals in Ne+ will be created programmatically by particle systems and post-processing effects. The look of the game will be an important part of both the game and its implementation. Because I do not currently know anything about how to create post-processing effects, it will be an educational experience for me and will be extremely useful for any visual projects that I work on in the future.

### Dynamic Audio

The audio in Ne+ must be connected directly to the events that the player is triggering, as well as all of the interactive game object visuals themselves. Level objects will pulse and glow to the tempo of songs, as well as create sounds in sync with the audio when certain interactions occur. This will create a dynamic soundtrack that the player can influence through various actions as puzzles are solved, and help to create a pleasing audio experience.

# Customers

The customers for this project are those who enjoy and support indie game development, as well as those who enjoy platformers and other 2D games focusing on puzzle-oriented gameplay. The game is meant for both young and old customers, although some of the more complex pieces of the game may be hard for younger audiences to fully enjoy. Only those using Microsoft technologies will be fully supported, although ports to other platforms may be possible.

More specifically, only customers who use Windows 7 and the Xbox 360 are initially targeted. Other platforms are not supported due to complications brought about by completely cross-platform video games.

# Project Success

### Success Measure 1

Number of Players Who Report Enjoyment of the Game – The number of people who play the game and report enjoying the game will be the key measure of the success of the project, as the project is geared toward the realm of entertainment.

### Success Measure 2

Dynamic Audio/Visual Content – The number of people who felt that the audio and visuals of the game were dynamic in nature and audio/visually appealing will be used to measure the success of the game style.

# Risk Management

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| --- | --- | --- | --- | --- |
| **Risk ID** | **Risk Description** | **Risk Impact (1-10)** | **Risk Likelihood (1-10)** | **Risk Priority (Impact \* Likelihood)** |
| 1 | Game Object Interaction and Dynamic Audio/Visuals is too Complex | 10 | 9 | 90 |
| 2 | Artificial Intelligence Implementation & Usage is too Complex | 7 | 10 | 70 |
| 3 | Game Development is too Complex | 10 | 5 | 50 |
| 4 | Plot of Video Game Doesn’t Mesh with Gameplay Mechanics and AI | 8 | 6 | 48 |
| 5 | XNA is too Complex | 10 | 3 | 30 |
| 6 | Supporting the Xbox 360 Hinders Development | 5 | 5 | 25 |

# Technical Environment

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| --- | --- | --- |
| **Technical Area** | **Technical Tool Used** | **Where You Learned the Technology** |
| Programming Language(s) | C# | GUI class, Junior Project, Internship |
| Application Framework | XNA 3.1/4.0, IceCream Engine, Milkshake Editor | Game development class, summer research |
| Client Tier / User Interface | Paint.NET, GIMP, Maya, Adobe After Effects | Maya Modeling Classes, Experimentation |
| Networking | N/A | N/A |
| Artificial Intelligence | Genetic Algorithms & Other AI Techniques | Reading books over the summer, other research, BRAINS engine |

# Appendix A – Glossary

A.I. – Artificial Intelligence

NPC – Non-Playable Character

XNA – XNA’s Not Acronymed, a game development framework