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COS 301 Capstone Project 2017

Vulknut Software Engineering

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EPI·USE® LABS
value through innovation

3D VR Presentations

GitHub Repository: Valknut Software Engineering

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1 System Requirements and Design

1.1 Introduction

1.1.1 Purpose

This document serves to outline the overall description and requirements of the system. This document also serves as a guideline to the developers in order to ensure the final product meets these requirements, and indicates to the client what the required technologies are in order to be able to use this system.

1.1.2 Scope

The overall objective of this project is to provide any given user with a toolkit, with which the individual can create a 3D virtual reality presentation with ease. Our goal is to make it simple to use, enabling virtually any user to utilize the power of 3D, without having to build 3D objects completely from scratch. The user would custom build a 3D environment built upon a variety of available templates offered, or by selecting a set of 3D models and skyboxes when choosing to create a project from the ground up, taking user experience to a whole nother level.

1.1.3 Definitions, Acronyms and Abbreviations

MEAN MongoDB, Express.js, AngularJS (or Angular), and Node.js

VR Virtual Reality

MVP Minimum Viable Product

MTBF Mean Time Between Failures

1.2 Design

1.2.1 Software Methodology

We will follow the Agile development methodology. The principles this methodology is based on advocates planning, constantly evolving development, early delivery and continues improvements, and it encourages flexibility as well as maintainability.

The agile development process is built on four main principles:

1. Individual and team interactions over processes and tools.
2. Working software over comprehensive documentation.
3. Customer collaboration over contract negotiation.
4. Responding to change over following a plan.

Due to frequent meetings with the client we are preparing for numerous requirement changes to be made in which the agile methodology thrives in. Requirements, implementation, design, etc., are continually revisited through the agile development life cycle.

For these reasons we specifically chose agile software development as it is well-known and the most applicable.

1.2.2 Development Technique

During our first meeting with EPI-USE they had mentioned that we should make use of a development technique called MVP. A MVP is the most basic version of a product that can still be released. The point of this technique would be that early adopters would see the potential that the final product could offer, and give developers valuable feedback needed to guide them forward.

1.3 System Requirements

1.3.1 Functional Requirements

The following functional requirements will be met:

1. The toolkit will allow users to create 3D environments.
2. Users will be able to add objects to the environment.
3. The toolkit will allow users to select pre-built environments.
4. Users will be able to share content they have created, or integrate content that is publically available, making the project evolve even further through the comunity.

1.3.2 Non-Functional Requirements

The following non-functional requirements will be met:

1. Usability - key concern is to make this system easy to use.
2. Reliability - the system should not fail, aiming for a high MTBF. A strategy will be in place for error detection.
3. Portability - making use of Unity3D allows our software to be compatible with a large variety of VR devices. A simple installation is all that is required.
4. Modifiability - aiming for a community driven approach we will ensure that software is easily upgraded.
5. Platform constraints - developing in Unity3D caters for the widest VR devices.

1.4 Target Audience Characteristics

Our first focused audience would be targeted at the educational sector. Our initial goal would be to provide a toolkit for an individual to build a basic educational scene.

1.5 Technologies

In our first meeting with EPI-USE we had discussed the use of various technologies. They had given us "free will" with regards to what technologies to use. After we had committed ourselves to extensive research we had selected the following, but did not limit ourselves to:

- Creating a 3D environment to design and bring to life a 3D presentation.
- Unity 3D virtual reality system tool kit library.
- HTC Vive virtual reality gear (already available).
- Import external models.
- Using plug and play libraries.
- Possibly include library templates for uses to build on.

- Community driven approach.
- Windows 10 environment.
- Docker.
- TravisCI.

2 Test Reports

2.1 Internal: Testing With Team Members

2.2 Usibility Testing

2.3 Examples of Target Audiences

2.3.1 Educational: Eg School Teachers

2.3.2 Corporate: Eg Board Members at a Project Proposal

3 User Manual

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