**CS465 – Design Team #5**

**Design Document for:**

# Tribe to Survive

**A virtual Reality Economic Simulation Experience**

“Native North America probably wasn’t this interesting…”

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Version # 1.00

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tribe to survive 1

Design History 5

Version 1.10 5

project Overview 6

Philosophy 6

Focus 6

Inspiration 6

Common Questions 6

What is the project? 6

Why develop this project? 6

What is the setting? 6

What does the user control? 6

What is the main goal? 6

What is unique about this proejct? 7

Feature Set 8

General Features 8

Multi-player Features 8

Editor 8

Game play 8

The Game World 9

Overview 9

World Features 9

The Physical World 9

Overview 9

Key Locations 9

Travel 9

Scale 9

Notable Objects 9

Weather 9

Day and Night 9

Time 10

Rendering System 10

Overview 10

2D/3D Rendering 10

Camera 10

Overview 10

Camera Placement 10

Camera Movement 10

Game Engine 10

Overview 10

Water 10

Physics 10

Lighting Models 11

Overview 11

Lighting Model (Outside/Day) 11

Lighting Model (Inside/Day) 11

Lighting Model (Outside/Night) 11

Lighting Model (Inside/Night) 11

Game Characters 13

Overview 13

notable characters 13

interaction (Enemies, etc.) 13

User Interface 14

Overview 14

main menu 14

tribal status 14

hunting/gathering 14

pottery making 14

agriculture 14

trade 14

artifacts 15

Overview 15

hunting/gathering 14

pottery making 14

agriculture 14

trade 14

Musical Scores and Sound Effects 16

Overview 16

3D Sound 16

Sound effects 16

Single Player Game 17

Overview 17

Single Player Game Detail #1 17

Single Player Game Detail #2 17

Story 17

Hours of Game-play 17

Victory Conditions 17

Customization 18

Persistence 18

Saving and Loading 18

Character Rendering 19

Overview 19

Character Rendering Detail #1 19

Character Rendering Detail #2 19

Extra Miscellaneous Items 21

Overview 21

stretch ideas 21

“Objects Appendix” 22

“User Interface Appendix” 22

“Character Rendering and Animation Appendix” 22

“Story Appendix” 22

Design History

The following is a summary of changes made specifically to this document. The version numbers do not correspond to versions of the application architecture, but rather the version of this document itself.

## Version 1.10

Redefined Gameplay and Genre Focus

1. Moved primary focus from “game” to “simulation”.
2. Further defined gameplay elements, and what user will actually do.

# Project Overview

## Philosophy

### Focus

The primary goal of this project is to utilize VR genre and mechanics research to develop an immersive, educational experience that is both enjoyable and informative. Having relation to both history and education, the genres of strategy and simulation are to be applied in order to achieve this goal.

### Inspiration

Gameplay inspiration has been taken from a number of existing experiences and games. Primarily, cultural simulations that include interactive elements for users to feel a part of the progression of a culture through time. Examples of this include classic games such as Oregon Trail and Civilization. Gameplay elements from this genre are to be mixed with survival mechanics from games such as *Tharsis* or *FTL: Faster Than Light*, where users are responsible to manage entities throughout dynamic events. The result is an experience with primary tasks involving casual status management, while secondary tasks performed through “mini-games.”

## Common Questions

### What is the project?

This project is an exploration of concepts, applying modern VR technology research to the development of a unique educational experience.

### Why develop this project?

This project is relevant for two main reasons. First of all, VR as a platform has quickly come into various industry spotlights, and research into new applications for the platform deserves exploration. This project is also relevant as an opportunity for both the developers and stakeholders to discover how digital art can continue to serve as a learning tool while stimulating the imagination.

### What is the setting?

The setting for this project takes the user back in time to pre-European occupation of North America. Interactions are displayed and/or simulated for families of various economic statuses.

### What does the user control?

The user will control decisions made for one or more cultural entities in a primary management system, as well as partaking in a variety of actions during any “mini-games” related to these decisions.

### 

### What is the main goal?

The main goal is to advance the culture throughout time, combating opposition from external influence such as Europeans or natural disasters.

### What’s unique about this project?

This project is unique due to the technology (VR), world/time setting, and mixture of gameplay elements. The cultural simulation can progress on its own, acting as a standalone exhibit.

# Feature Set

## General Features

Mixture of 2D and 3D graphics.

World-space user interfaces.

Gaze-based interaction.

Randomly-generated events and outcomes.

AI agents for cultural entities to make decisions if the user does not intervene.

## Multiplayer Features

(None)

## Editor

(No world editor available)

## Gameplay

The simulation is started with a few number of families in view of the player, each in a primitive hunter-gatherer status. Time gradually progresses through each of four seasons, at the end of each season various calculations are performed to assess changes in state, assets gained, etc. Players can interact directly with the individual families to manage family assets or respond to events.

Each family household can have one focused activity among the following four: “Hunting”, “Gathering”, “Farming”, and “Production.” Each household can be specifically assigned by the player an activity to focus, otherwise the activity will be selected automatically by the AI. After each season, an amount of raw materials are yielded to the family based on the activity, time spent, and other attributes of the family. “Hunting,” “Gathering,” and “Farming” each yield raw materials, while raw materials themselves are combined into finished goods while the family is focused on the “Production” trade.

The player may choose to participate in any activity for a specific family, which will add to the materials/goods yielded to that family for the season. This puts the player into a sort of mini-game, where tasks are performed to show processes and environments associated with the culture. While participating in an activity, the simulated culture is still active, but will pause at the end of the season.

Several types of events may occur at the beginning or end of a season. These events may be beneficial or detrimental to one or all families. The occurrence of the events is randomized, but is also based on the season and various statistics of the family/community. Once all events are resolved and activity selections acknowledged, the next season begins.

As more of a cultural simulation than a game, a clear goal and risk/reward decisions are less emphasized than the environment and progression of the culture as a whole. As families become wealthier and more capable, the family home is periodically raised higher onto an earthen mound. Older families that do well to survive in this way are eventually be viewed as royalty.

The Game World

## Overview

Topical information of the Native Americans based on archaeological evidence.

Cultural tidbits that survive via written/oral tradition.

Minor elements of science education can be presented in the following:

Description of tools

Tempered pottery

Hunting/Gathering

Architecture

Social Hierarchy

## World Features

A top-down view of the game world is presented to the player, below them a randomly generated terrain map. The map is comprised of nodes, each assigned a status. The status of a node is either wilderness or belonging to a family. As a family grows, new households are placed on wilderness nodes adjacent to any node currently owned by the family.

## The Physical World

### Overview

The source of conflict of the game is the early history of Native Americans that is diverse and murky. Eventually the invading European forces beset an already churning societal structure. To facilitate the conflict, tribes maintain an array of activities and mitigate a series of offenses by rival tribes, political rivals, and Europeans.

### Key Locations (Scenes)

1. Tribal overview: Main screen showing current status of tribes.
2. Activity scenes (Hunting, Trading, etc.)

### Travel

The player will view either the entire community in the overview screen, or enter into the main household of a particular family. From within the household, the player can participate in a trade activity for the family, or otherwise manage that particular family.

### Scale

While in the main scene, tribes are shown from an aerial view. When inside an activity, the user is placed into a real-world scale environment.

### Notable Objects

Main Family House (Mound)

Family Households

Season Timer

### Weather

(N/A) ?

### Day and Night

(N/A) ?

### Time

## Rendering System

### Overview

Unity 5+ will be used in development of scenes, deployed to Samsung Gear VR.

### 2D/3D Rendering

Low poly models will be used throughout, with texture atlases preferable. Any static scenes will be pre-rendered “domes.”

## Camera

### Overview

As a VR game, the camera considerations should always be made with user comfort in mind. Standard considerations include constant acceleration during movement, and no residual manipulation of camera angle (head-bob, shaking, etc.)

### Camera Placement

Considerations made for each scene to provide entirely 360-degree view at all times. This includes considerations such as the focus of action, or possibly mechanics employed to ensure the user is aware of objects to be focused.

### Camera Movement

Movement of the camera should be avoided if at all possible. In special cases, placing the user in a vehicular setting is acceptable (i.e. in a boat).

## Game Engine

### 

### Overview

Describe the game engine in general.

### Water

Only low-poly, low resolution water should be used, as all scenes must maintain >60 fps.

### Physics

Unity provides built-in physics interaction. In scenes where this is used, special considerations to CPU performance will be made. Only a small number of interacting objects is recommended.

## Lighting Models

### Overview

Each scene maintains a common color palette, which can differ between indoor/outdoor and night/day scenes. Scenes of a common place or time should hold similar color palettes and lighting models.

### Lighting Model (Outside - Day)

Color palette for day is similar to a typical Midwestern cloudy day. Plenty of teal, light grey, amber, and brown for the environment. Global lighting model should be used, with only a slight directional light from the sky.

### Lighting Model (Inside/Day)

Indoor day environments have bright sections bleeding through spaces in structure, while indoor illumination provided either by fire or light from entryway. Bloom/HDR should be used on simple indoor scenes. Color palette is dark and dirty.

### Lighting Model (Outside/Night)

Nighttime outdoor lighting are very dark, with only slight global/directional illumination from the moon. Most environmental lighting should either be pre-rendered (environmental dome), or real-time spotlights from fire. Color palette is extremely cool, environment illuminated with faint blue/white light.

### Lighting Model (Inside/Night)

Almost completely black in corners, but vibrant near light sources (fire). Color palette shifts to the color of fire, accented by the whites, greens, reds, and golds of character clothing and possessions.

# Game Characters

## Overview

(TBD)

## Notable Characters

(TBD)

## Interaction (Enemies, etc.)

(TBD)

# User Interface

## Overview

The user interface is entirely composed of world-scale menus, decorated or cleverly disguised as in-game objects. The following sections detail the application of user interface in each respective scene.

## Main Menu

## Tribal Status

## Hunting/Gathering

## Pottery Making

## Agriculture

## Trade

# Artifacts

## Overview

The following artifacts are showcased throughout scenes, their use and importance highlighted in any related application.

## Hunting/Gathering

## Pottery Making

## Agriculture

## Trade

# Musical Scores and Sound Effects

## Overview

(TBD)

## 3D Sound

(TBD)

## Sound Effects

(TBD)

# Single-Player Game

## Overview

(TBD)

## Single Player Game Detail #1

## Single Player Game Detail #2

## Story

(TBD)

## Hours of Gameplay

(TBD)

## Victory Conditions

(TBD)

## Persistence

(TBD)

## Saving and Loading

(TBD)

## Customization

(TBD)

# Character Rendering

## Overview

## Character Rendering Detail #1

## Character Rendering Detail #2

# Extra Miscellaneous Items

## Overview

## Stretch Ideas

# “Objects Appendix”

# “User Interface Appendix”

# “Character Rendering and Animation Appendix”

# “Story Appendix”