CS 440 - Software Engineering 1 (Spring '13)

ORBITAL FORCES

Team 3

Jason Moreau
Joseph Katzin
Neha Sailesh Shah
Prasad Nair

Executive Summary:

Orbital Forces is a game that involves three-dimensional thinking to complete missions in a distant universe, allowing the player to conquer planets, and build civilizations on them. This game toggles in strategic thought process between first person and god-view (bird's-eye view) modes. The genres of Orbital Forces are space combat, real time strategy, and simulation.

The player begins a game on a space station out in space. The player launches a spaceship and picks a planet to conquer. The player then navigates to the planet, possibly encountering hostile forces on the way. Once the player has reached the planet, they must conquer the planet to take control of its resources. Based on the resources controlled, the player can start building a civilization. The player can then move onto conquering other planets and use resources collected thus far. Orbital Forces is a score based game where players compete to achieve the highest score. Scores are computed as a function of units and structures built, lost, and destroyed, and resources gathered.

The domain of this game is Space Colonization. This is a single-player 3D based real-time strategy and space combat game.

Project Drivers:

The client for this game is the gaming industry giant EA. The customers are the end users who are in the age group 13 and above. No prior gaming experience is required.

Project Constraints:

The only major constraint to consider in the design of this project is within the software being used for the game's development. Since this software will rely on some game engine code, then any constraint on development will be based upon the boundaries of the game engine. The product shall run on desktop PC's and laptops.

Key Functional Requirements:

- The game assumes Newtonian physics to work within its world.
- The game, titled "Orbital Forces" will be a tactical RTS game that will allow the players to perform space exploration, space battle, land combat and land colonization.
- The game has main menu that has options like New Game, Load Game, Save, Continue, Settings and Exit.
- While in Space, the player has a Heads-Up Display (HUD) through which it navigates and

issues commands. The HUD also displays player strength, nearby planets and a reticle that allows player to focus on the target while navigating between planets or during combat.

- The outer-space view shall be first-person, from the perspective of the spacecraft.

Key Non-functional Requirements:

- The look of the UI should be faithful to the genre of space exploration and colonization. That is, it should be futuristic, with clean lines and sleek curves.
- The feel of the interactive UI elements should reflect the behavior of modern science fiction spacecraft, such as that found in Star Trek: Voyager.
- The game is user-friendly for the intended age group of 13 and up.
- The other languages that the game supports shall be French, German, Mandarin Chinese and Hindi. These languages are chosen based on overall international popularity and majority speakers.
- Players should not be required to learn a list of commands before commencing play.

Releases:

The first release of the game would involve space exploration. A player will navigate between planets in space while considering the orbit of the planet, its speed and other planetary attractive or repulsive forces.

The system design has been broken into various subsystems such that it would simplify the development process and each subsystem can be developed by a team comprising of 2-3 developers. Relationships between subsystems are defined and subsystems are developed according to these relationships. The services provided by each subsystem are clearly defined as they assist in the development process. The system design keeps in mind the deployment environment and is developed accordingly. As in release one the game is a single player game, it is deployed on a stand-alone system that does not need any special hardware or network connectivity.

System Architecture:

We use MVC architecture pattern where Controller is used to manage the user interaction, Model maintains the domain and the View displays it to the game player. We have also defined an initial database system for the first release of the game. The entity relationship diagrams effectively define the primary keys and foreign keys and how various relations interact with each other.

Conclusion:

We believe that recent interest in three-dimensional gaming opens new avenues for games like Orbital Forces. We feel that this game can really take off in today's market.