Design - Part 1

Group 23 - Alex, Jack, Luke, and Reid
Advisor: Ahmed Shakil

Overview

Product Design Overview

- GameMaker Language Web Application
  - HTTP Supported Traffic
  - Object/Game Loop Cycle Handling
  - Game Logic Based on Rulebook
  - User Friendly Access Frontend

- Java Springboot Based Database
  - Modular/Swappable Database
  - Model View Controller Structure
  - Easily Modified/Deployed Backend

Ideation

Mind Mapping led to breaking the problem into smaller portions and solving each portion with the team's combined skill sets. Ideation mainly took the issue and matched it to a known and practical solution. No major breakthroughs were made during the process and no formal process other than a mind map was used.

Major Design Components

Manage Asset Equipment

Database Design

Game Board and Logic

Aircraft Equipment Menu

Primary Web UI

HTTP Interaction

Hardware Availability

Multiplayer Function

UI and Web App

- Modifiable game assets
- Multi role assets and rule implementation
- Varying limits to game asset armaments
- Selection menus
- Combat logic and game loop math
- Account and login
- Tutorial and game creation

Game Board and Logic

- Hexagonal grid with coordinates
- Dynamic grid cell storage for assets
- Pop up menus for easy viewing
- Drag and drop movement
- Asset range circles and movement limiting
- Display of all assets
- Compilation of all asset coordinates for transmission
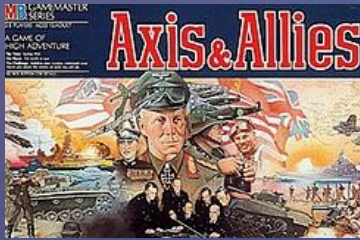- Refresh feature on returned HTTP requests

Multiplayer and HTTP

- Matchmaking via code
- Game creation and management
- Persistent storage
- Account creation/editing
- Turn based movement control

Market Research

Axis and Allies

- Realistic
- Physical board
- Outdated
- Ground/Sea units

KingFish ACE

- Officially sanctioned
- Designed for DoD
- Physical board
- Difficult to learn

Warhammer 40K

- Popular
- Expensive
- Unrealistic
- Many resources
- Physical and digital

Promising Solution

- Backend Java App Deployed on Pi Board
- Frontend Web App Developed in GameMaker Language (GML)
- Rule Logic Handled on Frontend
- Standardization and Saving Handled on Backend
- Assets Stored on Frontend via GML Sprites
- Data Transferred from Java App to SQL
- Local SQL Database Running on Pi Board

Conclusion