Friends of the Sea

# Design Document

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Section 1: Introduction

# 1.1: Foreword and Purpose

Conquer the Seas is the first game being developed by the in-house software team LIFDOFF for the McGill University Software Engineering Project course. The purpose of this document is to describe the technical design of the software in detail.

# 1.2: Scope

The purpose of this document is to describe the software design of the Conquer the Seas game and to explain how and why these designs were chosen. This document will detail the design, specifications, programming management, and test cases and testing procedures of the game. **Section 2** will start with the architectural considerations, then move to design considerations, and finally go in-depth into describing the high-level design of the game. This includes the discussion of the design pattern, the final domain model, and the final deployment diagram. **Section 3** will detail the actual software organization, including a view of the subsystems in both text and drawing. This will contain a detailed breakdown of one specific subsystem, with UML class diagrams and a list and explanation of class variables for this subsystem. There will also be a critical section which contains algorithm selection, critical code snippets, a state chart, and calling sequence diagram. **Section 4** discusses programming management by outlining the directory structure and programming tools, software building method, coding agreement, mitigation procedures, installation procedures, and training guidelines. **Section 5** will describe the test cases and testing procedures used for this project. This includes a description of test-driven development, functional test cases, the error logger, and how we built classes for auto-testing. **Section 6** is the appendix, which contains definitions and other useful information.

# 1.3: Audience

This document can be read from several different perspectives. It assumes a rudimentary knowledge of computer games and ideally some experience in software development. Regardless, the types of readers and which sections apply most importantly to them are as follows:

## 1.3.1: Game players

For the reader whose main focus is playing the game, **Section 4** will be the most pertinent. This section will contain information about how the game is stored locally on the user's machine, and will contain information about the install and setup of the game. It also contains the system requirements of the game. **Section 3** may also be of interest if the player wishes to modify code or see the inner workings of how the game is designed.

## 1.3.2: Developers

For the reader whose main focus is understanding and possibly modifying the code, **Section 3** will be the most important. This section outlines the specifics of the code, going into great depth about all aspects of the structure of the code. It also details algorithms used and has many detailed diagrams to explain the module/object decomposition. Individual subsystems are described in detail, so a developer could read this to understand how the software was written from the ground up.

# 1.4: References, Terms, Definitions

Conquer the Seas is a large software project that uses many technologies that will be discussed throughout this document. This section contains a listing of terms and abbreviations that will be used and may be referred back to for maximum clarity in further sections. It also contains references to the other two documents written for this software project so far.

## 1.4.1: References

Two documents have been written previous to this document. The Preliminary Design Document contained information about the basic functionality and gameplay of the game. It also contained a timeline of milestones and deliverables for which the project still holds to. The second document is the Requirements Document, which describes all of the functions and specifications of the game and is based on the IEEE 830 standard. It also contains many terms and definitions (including acronyms) that will be useful throughout this document as well. Reading these two documents before this document would give the reader a much greater understanding of the project. An implementation document will be released in the weeks following the submission of this document.

## 1.4.2: Terms and Definitions

* **pyGame**
  + pyGame is a set of Python modules designed for writing games in Python. It is free and released under the LGPL License (http://www.pygame.org/LGPL) and will need to be installed on all user machines along with the corresponding version of Python. For more information about pyGame, visit the pyGame website: http://www.pygame.org
* **Unified Modeling Language (UML)**
  + Unified Modeling Language (referred to as UML throughout the rest of this document) is a standardized modeling language for graphical representations of software design and software systems. Diagrams in this document will follow UML specifications.
* **Sprite**
  + A sprite is a 2-dimensional image or animated image used in video game graphics. In the context of Conquer the Seas, sprites will be used to draw and animate the different units and items. These graphics will be created entirely by the development team.

# 1.5: Polices and Tactics