

Fishing World Tour  
The School of Fish #14  
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# **Software Requirements Specification Document**

**Version: (1)**

**Date: (10/13/2022)**



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## 1 Purpose

An ecosystem's balance can be easily disrupted in many ways. One of the major ways that this happens today is through human intervention. Humans can terraform, hunt, gather resources, or introduce new wildlife into these areas and severely hurt the ecosystems there. A group of ecosystems directly impacted by this has been aquatic ecosystems. A great example would be Lake Erie. Since humans farm nearby, this creates a surplus of fertilizer within the water. This causes algal blooms which devastate any plant life within the lake. Plant life dying means that fish and other animals are being affected as well. Other examples include overfishing fish to the point of extinction, introducing new fish into regions with no natural predators, and polluting lakes and rivers with trash. While these issues may only seem to impact the wildlife living there, many other areas are affected as well. Using the Lake Erie example, these algal blooms affect many different forms of industry that surround the lake. Tourism, research, fisheries, and water treatment plants all use the lake to help bolster the local economies of the cities that live in the lake. If people are not informed about the impact that is happening to these areas, then nothing can be done about it.

That is why we want to develop a game system that can educate the public about these issues happening everywhere in the world. By educating the public about fish species and the aquatic ecosystems around the world, we can save these industries and ecosystems from going under and make a long-lasting impact on the people living there.

## 2 Scope

In order to educate the public, we plan on creating an educational fishing game called Fishing World Tour. Players will visit various aquatic ecosystems around the world, such as rivers and lakes, and catch the fish there. The goal of this game is to have players learn more about fish and aquatic ecosystems by having them visit these locations virtually and catch the fish themselves, as well as visit locations important to these ecosystems.

Once at a fishing location, the player will be able to play a fishing minigame. In it, the players can choose their rod and bait and try to catch some fish. The identity of the fish will be unknown until the player lands it. Once caught, the fish's species will be revealed to the player. For each new species the player catches, a new entry in a virtual field guide will be unlocked. This field guide will include information about the fish, such as its habitat, eating habits, or any interesting facts about it. It will also record the biggest and heaviest catches that the player has landed to give the players a sense of scale of the fish as well as reward them from catching multiple of the same species. The fish that the player catches will reward them with an in-game currency that will allow them to buy new tools and bait as well as allow them to visit new areas. Players will also be able to visit locations that are important to these aquatic ecosystems, such as the electric barriers that prevent invasive species from entering the Great Lakes. While the players will not be able to fish there, they will be able to learn what role these locations play in preservation of the environment in our modern day.

On the programming side, we will create a template for the fish, the fishing spots, and the locations important to the ecosystem such that they will be very easy to modify and create new ones with. With this, we will be able to easily create new locations for the players to fish and learn at and easily change these locations in the game if something about them changes in real life, too.

With this project we hope to educate people about marine wildlife and aquatic ecosystems in a way that is more fun and interactive than something like reading a long encyclopedia page. We also intend to make creating and modifying the fish and locations easy so that content can be added and modified to suit the users' needs. With enough work, the system could be modified so players could learn and fish in their local county or in a completely different area of the world.

## 3 User characteristics

### 3.1 Key users

Fishing World Tour will also be easy to operate, as we will be dealing with students possessing very different technological backgrounds. Depending on their home situation, they might have been exposed to a lot of technology, or possibly none, so the program will have to be very user-friendly in order to be accessible to as many students as possible. Students with learning disabilities could potentially benefit a lot from this software as it presents a more fun and engaging method of learning than traditional classroom teaching.

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### 3.2 Secondary users

The secondary users of this game will be the teachers and educators who will guide the students through using it. Although they are not the target audience, it is imperative that they understand how to use the program on a basic level at least, as they are the ones who will teach students how to use the application. Because the software was designed to be understood by children, the educators should have little to no issues comprehending the program and explaining its functions to the students.

### 3.3 Unimportant users

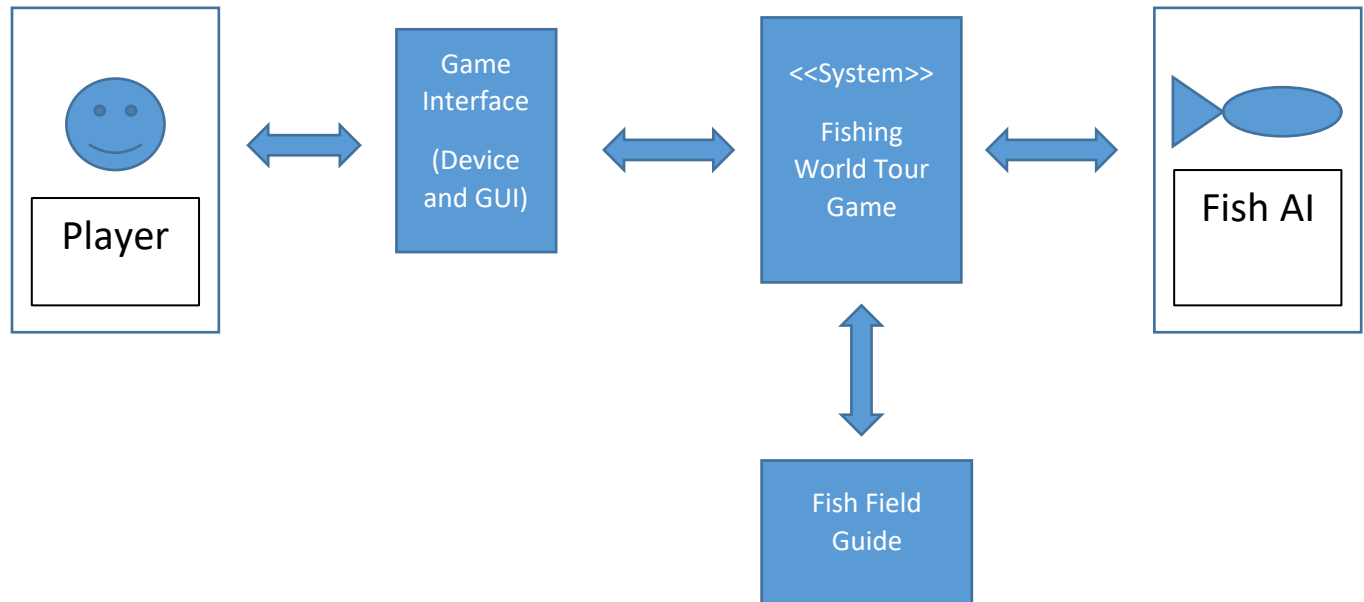
The unimportant users of Fishing World Tour will be people who are interested in learning about worldwide aquatic systems outside of an educational setting. This could range from teenagers taking an interest in the environment to adults who are already knowledgeable on this topic. Few considerations will be made from this group as they are not the target audience for the program, and it would be difficult for the program to cater to such a wide variety of people

## 4 Product perspective

### 4.1 System Context

As the player, you will interact with the input devices of your computer to move and complete actions in the game. You will also be looking at the GUI (Graphical User Interface) to get visual cues and information about mechanics and features. For example, a book icon in the bottom right corner signifies the fish encyclopedia that can be accessed. Both

will interact with the actual system to perform the proper output. Another example is using the keyboard to move the character. Then the system must be able to tell the fish AI how to move and act in the water and in correlation to the player's actions. These are the general relationships between the player, game interface, system, and fish AI. Below is a block diagram showing the general flow.

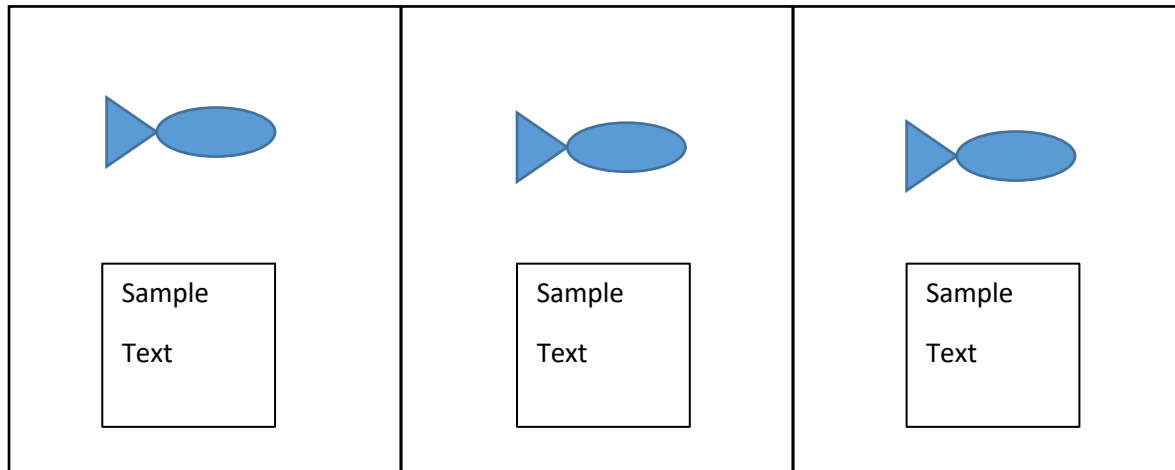


## 4.2 User interfaces

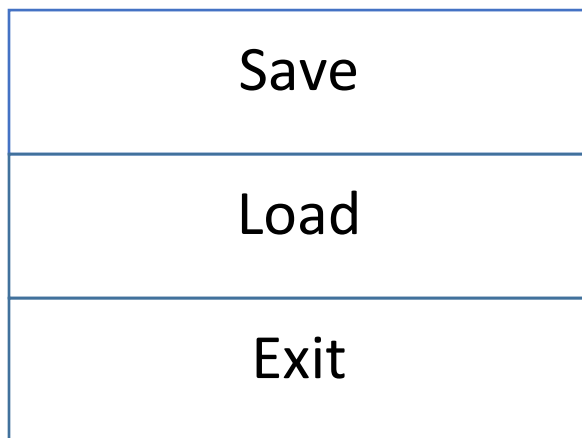
The player must interact with the game's interface in order to play it. Below is a list of requirements that are needed in order to facilitate that action. For example, we must allow the player to save their progress, and load it, so that way they do not lose it each time they play. All the requirements are necessary for the player to have a better experience using the game's interface.

- 1) It is required that the system's screen format be multi-media.
- 2) It is required that the system allows players to save their current state and load that state later.
- 3) It is required that the system has movement function when the player pushes the w, a, s, and d keys.
- 4) It is required that the system has a fishing minigame function when the player presses the space bar while the fish is tugging down on the hook.
- 5) It is required that the system has a menu for fish information.
- 6) It is required that the system has a start menu for the game.
- 7) It is required that the system has a save, load, and end game menu.
- 8) It is required that the system has a pop-up to alert a new fish species has been caught.
- 9) It is required that the system has a fishing tutorial menu.

10) It is required that the system field guide menu have the following layout:

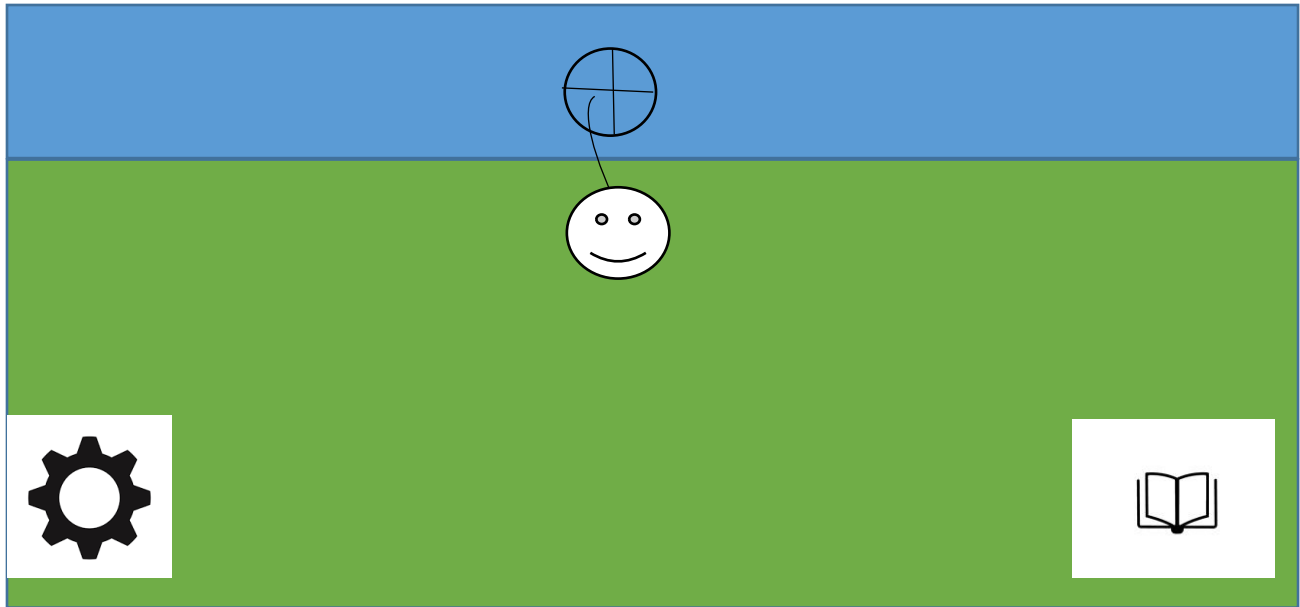


11) It is required that the system settings menu have the following layout:



12) It is required that the system interfaces have the following screen layout:





### 4.3 Software interfaces

The only software product that is required is the Unity Real Time Development Platform. This software is a game engine that is heavily used by individuals and small game companies to develop their games. Below are some requirements regarding what our customer wants us to use Unity for, and general information about Unity has a software.

- The full name of Unity is the Unity Real Time Development Platform.
- The required versions are 2022.1
- For source information, this GitHub link provides documentation: <https://github.com/Unity-Technologies/UnityCsReference>
- The system must use Unity Real Time Development Platform as its game engine
- The system's code should be written and stored within Unity
- For windows, the specifications are below:

	Windows
Windows 7 (SP1+) and Windows 10, 64-bit versions only.	High Sierra 10.13+
CPU:	X64 architecture with SSE2 instruction set support, Apple Silicon
Graphics API:	DX10, DX11, and DX12-capable GPU

### 4.4 Hardware interfaces and Memory constraints

Since this is a fishing game, there are requirements that must be considered for the screen output, and the devices used to interact with the game. Those requirements are listed below along with specifications for the target machines this game will be played on.

- The screen output should support full screen of 1080X800 pixel.
- Target devices have roughly 8gbs of ram, so the design footprint cannot exceed that amount.

- Target devices have roughly 250gbs of storage, so then the design footprint cannot exceed that amount.
- Target devices have either built-in or low-end graphics cards, so the graphic design cannot be too extensive.
- Keyboards are to be supported by the system.
- Keyboards will allow for the player to move the character in the game.
- Mice are to be supported by the system.
- Mice are used to navigate the menus
- Both keyboard and mouse allow players to interact with the game.

#### 4.5 Deployment requirements

Since this is a game, there are requirements that revolve around the installation and running of the game. Those are listed below:

- New levels and fish must be downloaded and added to the game in their proper directories if the player wishes to play those levels and catch the fish featured at those levels.
- An internet connection will be needed to download the installation files and receive updates.
- The device should be able to install software.
- The computer must meet the required specifications in order to run the game (including OS requirements)

### 5 Assumptions and Dependencies

- The player can use a keyboard to control the game.
- The player has basic English reading ability to read the fish field guide.
- The user has an operating system that can run Unity.
- Windows 10 will be available on the device designated for the software product.
- The player knows what a fish is
- The user knows how to install a game

## 6 Specific requirements

### 6.1 System Functional Requirements

- The player presses the w, a, s, d keys, and the character moves in accordance to that direction.
- Once the player is at a river and presses the space bar, the player character will cast their line and begin fishing
- If the space bar is pressed once the reticle is over the fish, then the fish will be hooked.
- The player will then enter a fishing minigame in which they use the arrow keys and space bar to reel the fish in and capture it.
- The player can select different maps which take the player to new areas to fish.
- When a fish is caught, the field guide will record the weight and height of the fish.
- When the player saves the game, an output telling them the game has been saved will appear
- When the player clicks on the field guide, a fish menu opens showing the different types of fish
- When the player clicks the options icon, the options menu opens.

## 6.2 Logical Database Requirements

- The field guide and locations to fish themselves shall be connected to a data structure containing information about each of the fish, such as the text for its field guide page, a picture to display onscreen, etc., and the locations where they are caught, in order to provide the GameManager (Object in Unity commonly used with storing/retrieving information) with a reference point to get information.

## 6.3 Software System Attributes

### 6.3.1 Usability

- The game interface shall be presented in a way that is easy to understand to allow the game to be accessible to younger players
- The game shall not contain any explicit content so that it is able to be used in schools
- The player character may be able to visit locations that are important to the preservation of aquatic ecosystems (e.g., electric barriers that prevent invasive species from entering the Great Lakes) so the player can gain additional knowledge on the different fishing locations.

### 6.3.2 Performance

- The fishing gameplay will not be hampered by lag, such as dropping below 30 frames per second.
- The game shall have a 5-second load time when switching between game scenes in order to maintain the flow of the game

### 6.3.3 Reliability/Dependability

- The information about the fish should be accurate to not spread misinformation about them
- The gameplay should not have any bugs within the final version. Example would be a fish not being logged after being caught
- The system should save data properly saves and loads, to ensure that players can continue and not lose their data.

### 6.3.4 Security

- The system shall be able to authenticate user data to prevent pirating of the game
- The system shall backup the saved data, in the event of data corruption
- The system shall encrypt saved data to prevent data privacy leaks

### 6.3.5 Maintainability

- The system shall prompt users when there is a new update for the game, so that the player always has access to the latest version of the game
- The system shall use polymorphism within the code, so it can be updated more easily in the future
- The system interface shall have extra space in the event more features are added later
- The system's interface shall not cover more than 50% of the game screen, so the player can still view the game properly