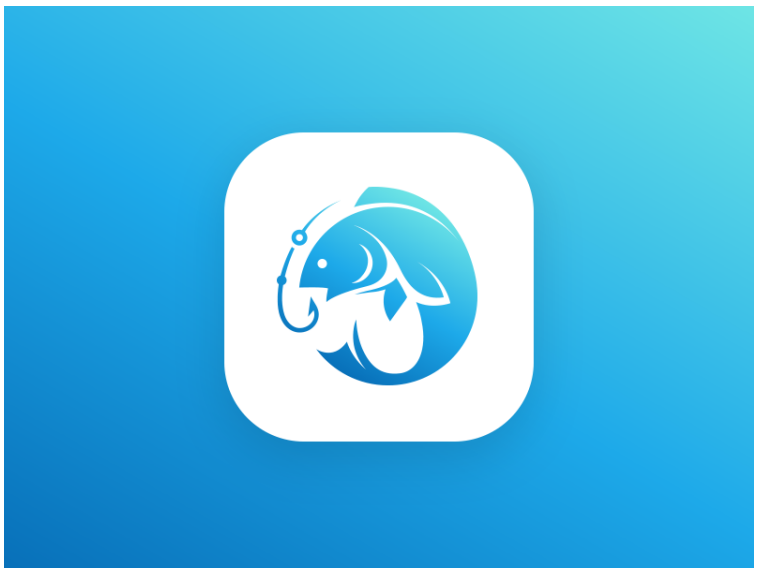
Department of Computer Science & Engineering
The University of Texas at Arlington

System Requirements Specification
CSE 4317: Senior Design II
Spring 2023



Team Fish Quest
Fish Quest

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Revision History

Revision	Date	Author(s)	Description
0.1	10.12.2022	BS, KP, MZ, OK, WS	Document Creation
0.2	10.17.2022	BS, KP, MZ, OK, WS	Complete Draft
1.0	12.13.2022	BS, KP, MZ, OK, WS	Updated Document (Revised Section 1, 6 & 8.2)
1.1	05.01.2023	BS, KP, MZ, OK, WS	Complete Draft

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1 Product Concept

This section describes the purpose, use, and intended user audience for FishQuest. FishQuest is an mobile application that is designed to revolutionize the fishing experience through social media and reward based features that will allow users to be more engaged with the fishing community along with creating a sense of achievement while fishing.

1.1 Purpose and Use

The overall purpose of FishQuest is to make fishing more enjoyable by creating different incentives to fish. FishQuest's social media features will allow users to log their catches to a public platform where they can gain recognition for their catch in addition to being able to virtually interact with other users. The reward system creates even more incentive to fish by constantly generating new fishing related missions that will allow users to gain various achievements and level up their account.

1.2 Intended Audience

FishQuest is intended to be used by anyone who has an interest in fishing regardless of their level of experience in fishing. Veteran anglers will benefit from many FishQuest features that will enhance their typical fishing experience. FishQuest also aims to attract and maintain newer anglers by providing them with an interactive online platform where they can acquire fishing knowledge, improve their skills, and have fun while doing it.

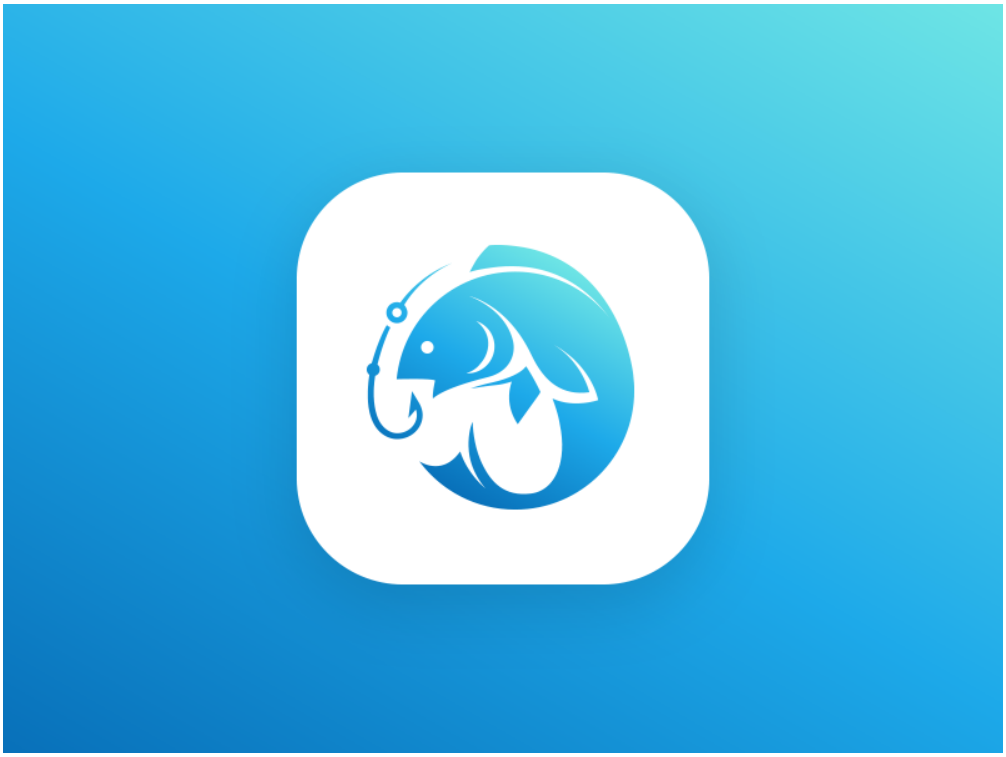

Figure 1: Fish Quest conceptual drawing

2 Product Description

This section provides the reader with an overview of FishQuest. The primary operational aspects of the product, from the perspective of end users, maintainers and administrators, are defined here. The key features and functions found in the product, as well as critical user interactions and user interfaces are described in detail.

2.1 Features & Functions

FishQuest will contain three main components to enhance the fishing experience. The three components are the catch logger, the social media features, and the rewards system. When opening the app, users will be greeted with the home page as seen in figure 2. The main part of the home page is associated with the social media feature. When users log their catches, it will be made visible here for all other users to view and interact with. The bottom portion of the home page contains icons that will allow the users to navigate to other components within the app. If the user wishes to upload a catch, they can select the logger icon which will redirect them to the catch logger page as seen in figure 2.On this page, users can enter all the necessary information about their catch and then click submit to upload it to the platform. On the page page, the user can also access the missions menu which can be seen in figure 3. The missions menu displays a list of fishing related missions and the correlating rewards. Lastly, from the main menu, the user can also choose to view the map page which will display the location of every previously logged catch.

2.2 External Inputs & Outputs

Input	Output
Name, email, username, and profile picture when registering an account	Name and email will be linked to the account. The provided username and profile picture will be visible to other users when using social features
Detailed fish information and caption when logging catch	Catch data will be displayed on the main feed page
Picture of fish when logging catch	Machine Learning Model classifies species of fish. Picture will also be appended to catch post.
Location when logging catch	Location of catch will be visible on map page
Liking or disliking a catch post	Like or dislike counter will increment
Commenting on a catch post	Comment will be publicly visible

Figure 2: Input Output Chart

2.3 Product Interfaces

Figures 2 and 3 are conceptual UI designs of what the main components in the application will look like.

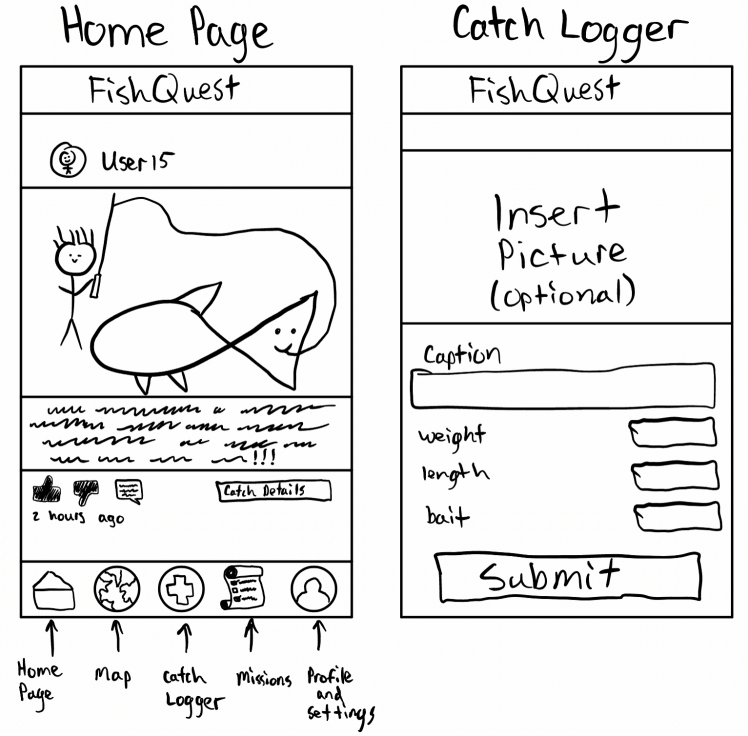

Figure 3: Home Page and Catch Logger Concept UI

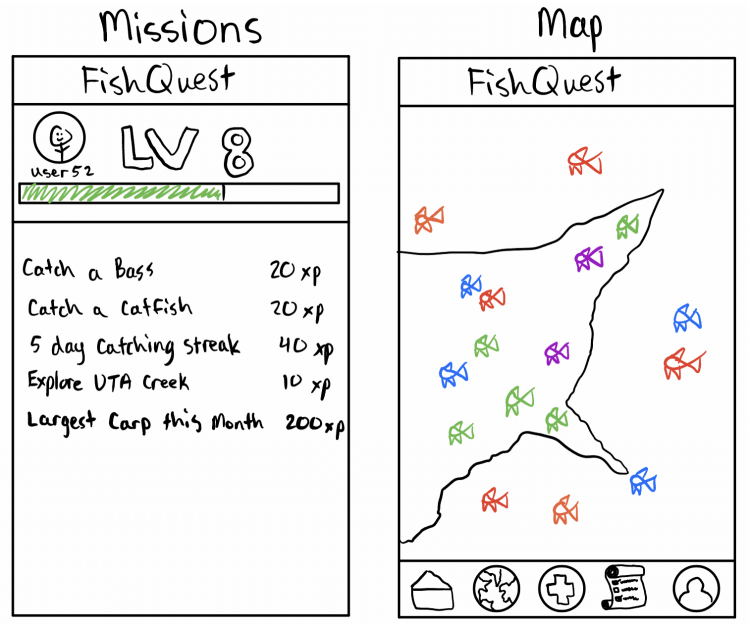

Figure 4: Missions and Map Concept UI

3 Customer Requirements

The Fish Quest app has 5 main customer requirements that are needed to have a functional prototype that would function well as a proof of concept as well as a useable application. The first requirement is the Fish logger which will allow the users to document their fish catches as well as some additional info including size species and location. The location from the fish log will then feed into a map that all users can see that will describe where and what species fish have been caught in the area. Users will then be able to share their catches on a social media feed that would be similar to Instagram in style and use. All of this would of course require a proper login and registration system. And finally users will have to be able to progress their accounts through means of xp, missions and achievements like a video game.

3.1 Catch Logger

3.1.1 Description

This application will contain a catch logger feature that will allow users to upload catches to the platform. Users will be able to include information about the catch such as the fish's length, weight, location of the catch, the bait used, a picture of the fish, and a customized caption. Once submitted, the logged catch and all of information provided will be displayed in a traditional post format and will be visible on the feed page for all other users to see. While entering information about a catch, the app's machine learning model will also be used to identify the fish's species based on the image what was provided by the user.

3.1.2 Source

The source of this requirement is all group members.

3.1.3 Constraints

Users must provide their location to log catches. Also, the machine learning model can only identify a limited number of fish species.

3.1.4 Standards

Once the user submits a catch, all of the information about the catch will be stored and accessed through PostgreSQL.

3.1.5 Priority

Critical

3.2 Map

3.2.1 Description

The Application will have a maps page that will display the location of each fish caught and logged by each user. A user has the ability to move the map around and select a pin that will display the information of that logged catch. .

3.2.2 Source

The source of this requirement is Kevin Phan

3.2.3 Constraints

The users will have to allow access to location for them to log catches and for the catches to display on the map.

3.2.4 Standards

The Map will be developed using the Google Maps API

3.2.5 Priority

High Priority

3.3 Social Media Feed

3.3.1 Description

The app will contain a page that displays a traditional social media feed. Upon opening the app, users will be redirected to the home page which houses the social media feed. The social media feed is structured as a list view that contains recent catch log posts. Users will be able to like, dislike, and comment on posts.

3.3.2 Source

The source of this requirement is all group members.

3.3.3 Constraints

Users must have a registered account to have access to the home page which houses the social media feed.

3.3.4 Standards

The social media feed will be designed like other social media feeds that can be found on other social media platforms.

3.3.5 Priority

Critical

3.4 Missions

3.4.1 Description

The Application will have a mission's page where users will gain XP after the completion of a specific task. Each week there will be a unique mission for users to gain XP as well as other missions ranging in difficulty for different amounts of XP based on that difficulty.

3.4.2 Source

The source of this requirement is all group members

3.4.3 Constraints

The missions will most likely need to be updated frequently which could take a significant amount of time.

3.4.4 Standards

The missions will be based on the specific types of fish found locally

3.4.5 Priority

High Priority

3.5 Login and Registration

3.5.1 Description

The Application will have a registration page that will ask for a username, email, and password. The login page will ask for the username and password. This is necessary to allow users to post and use the social media features.

3.5.2 Source

The source of this requirement is all group members

3.5.3 Constraints

The main constraint will be ensuring the security of the database and user information.

3.5.4 Standards

The user information will be stored and accessed through PostgreSQL database.

3.5.5 Priority

Critical

4 Packaging Requirements

The application Fish Quest will be accessible on a variety of platforms for the users convenience. Every user with either an Android or iOS mobile phone will be able to download the application for free after it has been launched on the App Store and the Play Store. The source code will be made commercially available on Trello and GitHub.

4.1 Availability in App Store/Google Play Store

4.1.1 Description

The application will be released on the Google Play store [1] and the App Store [2], with the goal of informing users about the application's main purpose and increasing its popularity, particularly among fishers throughout the world.

4.1.2 Source

We agreed after a team discussion that we wanted our application's user interface (UI) to be cross-platform so that all users may benefit from it.

4.1.3 Constraints

- To download the app, ensure that your phone meets the software requirements and is compatible with the app's specs.
- It is recommended that you have a lidar camera on your phone to properly use all of the functionality of our application.

4.1.4 Standards

- Users using iOS devices (Apple Products) will be able to download the application from the App Store.
- Users using Android devices will be able to download it from the Play store.

4.1.5 Priority

Low Priority

4.2 Compilation on Trello/GitHub

4.2.1 Description

The source code released on Trello/GitHub can be utilized to download the application and then clone it on their respective devices. To access all of the application's functionalities, the user must follow the directions in the Read-me file on how to install the application using the raw source code and then execute the executable file on their devices or an emulator.

4.2.2 Source

We agreed after a team discussion that we wanted our application's user interface (UI) to be cross-platform so that all users may benefit from it. If someone wants to add additional functionality, they can do so which in turn increases the functionality of the application.

4.2.3 Constraints

The user must install only the PERN stack versions that are supported by the programs, which essentially means that the user must install only the versions that were utilized during the software's development.

4.2.4 STANDARDS

All the instructions will be provided in the Read-me file under the source code -

- Clear instructions will be provided on how to install the application from the source code.
- Which versions were utilized during the development of the project.
- What frameworks and other important API were utilized during the development of this project.

4.2.5 PRIORITY

Mid Priority

5 Performance Requirements

This section specifies how the application should function or respond in overall. The Fish Quest application will have a number of requirements to maintain overall performance and distinctiveness among other applications. This application is far more usable than other apps that impose limits on the device since they are restricted to specific operating systems, making it difficult for users to download and use it freely. It is also synced with the databases, making the application much more interactive and responsive in terms of data retrieval where the feed page automatically refreshes to display new, up-to-date content. Since the application has a very high refresh rate it might consume some of your battery life. The application allows users to upload their content to the feed page and view the updates of other users as well.

5.1 Responsiveness

5.1.1 Description

The application should react as expected because that is how it is intended to operate. It must be responsive enough for the user to use it without any problems. Additionally, the user must be able to access all of the pages, such as by scrolling or swiping to switch between them.

5.1.2 Source

Following a team discussion, we agreed that responsiveness is a critical component for a smooth and interactive interface, which would improve the quality of the user experience.

5.1.3 Constraints

Our application's functionality may not be supported by an outdated operating system or an incompatible device, which lowers the application's responsiveness.

5.1.4 Standards

The program is developed in such a way that users will have no difficulty understanding its layout. The application is simple to understand and operate.

5.1.5 Priority

High Priority

5.2 Real Time Database

5.2.1 Description

The purpose of the real-time database is to maintain track of login information and user information that is saved in our local database. It not only maintains log-in information, but it also stores every user's post, which is utilized for data collection and then afterwards used for training models to increase efficiency when forecasting different types of fish species.

5.2.2 Source

Following a team discussion, we concluded that it is essential to maintain the entire data at our local database in order to increase the interactivity and efficiency over time, as well as the prediction rate of identifying the fish caught by the users.

5.2.3 Constraints

Prediction rate is not 100 % efficient.

5.2.4 STANDARDS

For security reasons, it prevents unauthorized access to the app and does not allow any user into the application unless he logs in or makes an account on our application.

5.2.5 PRIORITY

High Priority

6 Safety Requirements

The safety requirements for this project are very limited given that this is a software only mobile application. Any safety issues in regards to this app are from the act of fishing itself or from using an app in general, not from the Fish Quest application. Users should be mindful of their situation and area when using the application, for example users shouldn't use the app while driving a car or boat and should always remain aware of their surroundings to prevent any danger to themselves or others.

6.1 Safe usage of a mobile app

6.1.1 Description

Its important whenever using any mobile application, or mobile phone in general, that the user remain aware of their surroundings. This is to prevent harm or damage to oneself, anybody else or surrounding property. This includes such examples as not using fish quest while driving, while operating a boat, while walking, or while in any other situation that requires one to pay attention in order to remain safe.

6.1.2 Source

We considered all of the potential risks when using the app through a team discussion and concluded that the risks provided in the description warranted a caution for the users.

6.1.3 Constraints

N/A

6.1.4 Standards

Clear and concise language will be used when providing the list of risks when using the app.

6.1.5 Priority

Critical

7 Security Requirements

This app has several security requirements, most of which involve user privacy and account security. In regards to user privacy our database will need to be safe and secure because of it storing sensitive user data such as personal email and location details. The database will need to be encrypted in order to protect this sensitive information.

7.1 Database Security

7.1.1 Description

The database will need to be secure in order to protect all the sensitive user data that will be stored within. This means the database will likely need to be encrypted or otherwise secured. User privacy is a very large concern in this app as the users will be trusting us with their personal information including but not limited to location information and contact information.

7.1.2 Source

N/A

7.1.3 Constraints

Our only real constraint on this is the security measures offered by postgres and express in regards to encryption of the data.

7.1.4 Standards

N/A

7.1.5 Priority

Very high

7.2 Personal Account Security

7.2.1 Description

The main factor in this requirement, being as a lot of the security will be on the database side, is that users are using secure passwords. We will enforce a minimum password strength feature however this will not be very restrictive on users as if users wish not to be too protective of their account that is on them.

7.2.2 Source

N/A

7.2.3 Constraints

The users desire and ability to come up with a complex password.

7.2.4 Standards

N/A

7.2.5 Priority

Mid

8 Maintenance & Support Requirements

Maintenance of the app will be carried out periodically. This includes new features, updates to implemented features, improvements to features, and potential bug fixes.

8.1 Maintenance

8.1.1 Description

The app will need to be updated to support the latest versions of iOS and Android or to update the VPS dependencies.

8.1.2 Source

Team members

8.1.3 Constraints

Due to the many gears and layers involved, ruling out all the bugs and addressing them will be difficult to accomplish in a reasonable amount of time.

8.1.4 Standards

There are no applicable standards

8.1.5 Priority

Low

8.2 Version Control

The app will be maintained through a GitHub repository. All source code and other assets will be stored in the repository for development

8.2.1 Description

Our team ensures that we provide an updated version of our application while also meeting the needs of our users with emerging technologies. We also make certain that we provide all updates as well as clear instructions on how to download the updated version.

8.2.2 Source

Team members

8.2.3 Constraints

The maximum storage capacity that GitHub allows for the repository

8.2.4 Standards

Developers ensure that updated documents are well documented so that the updated versions can be identified.

8.2.5 Priority

High

9 Other Requirements

This section will include additional requirements not covered in section 3. The requirements will include requirements related to the design and development of our product.

9.1 PERN Stack

9.1.1 Description

The application will be a full-stack application developed using the PERN stack which consists of PostgreSQL, Express, React, and NodeJS.

9.1.2 Source

The source of this requirement is William Sigala

9.1.3 Constraints

Learning the stack will take a significant amount of time

9.1.4 Standards

N/A

9.1.5 Priority

High Priority

9.2 GitHub

9.2.1 Description

The source code will be maintained by all members in a GitHub repository. The repository will be private.

9.2.2 Source

The source of this requirement is all members

9.2.3 Constraints

N/A

9.2.4 Standards

N/A

9.2.5 Priority

High Priority

10 Future Items

The following requirements will be implemented in future iterations.

10.1 User Followers

10.1.1 Description

Users will be able to search for other users and follow them. The social media feed will then be based on posts from other users you follow.

10.1.2 Source

The source of this requirements is all team members

10.1.3 Constraints

N/A

10.1.4 Standards

N/A

10.1.5 Priority

Low Priority

10.2 Expansion to the rest of the United States

10.2.1 Description

The data set will be expanded to cover all types of fish found in the United States rather than locally.

10.2.2 Source

The source of this requirements is all team members

10.2.3 Constraints

Collecting a large number of pictures for each fish type across the United States would require a larger team.

10.2.4 Standards

N/A

10.2.5 Priority

Low Priority

REFERENCES