**INTRODUCTION**

**Background of the Study**

In today's world, where fish play a crucial role in providing essential protein for billions of people, ensuring sustainable management of fisheries is more important than ever. The Fish Information System (FIS) offers a comprehensive solution by bringing together various data sets—biological, environmental, and socioeconomic—into a single platform. This empowers decision-makers with the right information to make informed choices about managing fish populations and their habitats. By taking into account the complex relationships between fish and their environment, FIS promotes sustainable practices and helps prevent overfishing. Furthermore, it encourages collaboration among different stakeholders, fostering a shared responsibility for protecting our fisheries.

Before the advent of FIS, fisheries management faced significant hurdles. Decision-makers lacked access to accurate and timely data, making it difficult to assess the health of fish stocks and their habitats. This often led to ineffective management strategies and, in some cases, the depletion of resources. Moreover, without a centralized system, collaboration between stakeholders was limited, hindering efforts to protect fisheries. With the added challenge of climate change, the need for better monitoring and adaptive management has become even more pressing. FIS addresses these challenges by providing a platform for monitoring and classifying various fish through uploading an image into it.

**Objectives of the Study**

This study aims to develop a Fish Information System to improve the manual process of Marine Biologists in classifying and gathering information on various fishes.

**1.1. General Objective**

The general objective of the project is to develop a computerized system for Marine Biologists that improves efficiency, processes, and reducing manual errors without changing the manual process.

**1.2. Specific Objectives**

Specifically, the researchers intend to:

1. To design and develop a comprehensive and efficient Fish Information System for marine biologists.
2. To design and develop a Fish Information System with the following functionalities:
   1. Develop a system that has a capability to view various fishes.
   2. Develop a system that will categorize fish by genera.
   3. Develop a system that will categorize fish by scientific classification.
   4. Develop a system that has a capability to upload a fish image and retrieve its following information:
      1. Fish Name
      2. Binomial Name
      3. Scientific Classifications such that:
         1. Domain
         2. Kingdom
         3. Phylum
         4. Family
         5. Species
3. To design and develop a system that has a capability to print fish record.

**Scope and Delimitations of the Study**

* 1. **Scope**

The research titled "Fish Information System" aims to develop and implement a comprehensive software solution tailored to the specific needs of fisheries management. The system will primarily focus on the following key functionalities:

Viewing all fishes: Users will be able to access a database containing information on various fish species, including their common names, scientific names, habitats, and ecological characteristics.

1. **Viewing fish by genera:** The system will allow users to search and view fish species grouped by their genera, providing a convenient way to explore related species and their attributes.
2. **Viewing fish by scientific classification:** Users will have the ability to search for fish species based on their scientific classification, including orders, families, and species names, facilitating targeted information retrieval.
3. **Classifying a fish through uploading a fish image:** The system will incorporate image recognition technology to enable users to upload images of fish specimens. The system will then analyze the image and classify the fish, providing relevant information based on the identified species.
4. **Printing a fish record:** Users will have the option to generate printable fish records, containing detailed information about a specific fish species, for reference or documentation purposes.
   1. **Delimitations**

While the Fish Information System aims to provide a comprehensive solution for fisheries management, certain limitations will be acknowledged and addressed:

1. **Limited species coverage:** The initial version of the system may contain a predefined dataset of fish species, focusing on commonly encountered species in specific geographical regions or ecosystems. While efforts will be made to expand the database over time, the system's coverage may be limited initially.
2. **Accuracy of image classification:** The accuracy of fish classification based on uploaded images may vary depending on factors such as image quality, lighting conditions, and variations in fish morphology. While the system will utilize advanced image recognition algorithms, it may not always provide accurate identifications for all uploaded images.
3. **Data availability:** The availability of comprehensive data on all fish species, including their habitats, behaviors, and ecological roles, may be limited. The system will rely on existing databases, scientific literature, and expert knowledge to provide as much information as possible, but gaps in data may exist.

**Significance of the Study**

The Fish Information System holds immense importance for fisheries management, conservation efforts, and scientific exploration. It offers a powerful tool for informed decision-making regarding fish populations and habitats, aiding in sustainable practices and biodiversity preservation. Additionally, it serves as a valuable resource for researchers and educators, fostering collaboration among stakeholders and supporting adaptive management strategies. In essence, this study provides a comprehensive approach to addressing the challenges of fisheries management and conservation, ensuring the sustainable use of aquatic resources for generations to come.

**METHODOLOGY**

The methodology for the Fish Information System (FIS) involves designing the system's structure and functionalities, developing software with features such as database management and image recognition, rigorous testing and validation, deployment in relevant settings, and providing comprehensive documentation for users.

**Database Schema**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field Name** | **Field Type** | **Field Length** | **Field Description** |
| id | INT (PK) | N/A | Fish ID |
| name | VARCHAR | 100 | Fish Name |
| image | VARCHAR | 1000 | Fish Image Name |
| img\_url | VARCHAR | 1000 | Fish Image Link |
| binomial\_name | VARCHAR | 800 | Fish Binomial Name |
| url | VARCHAR | 1000 | Wikipedia Fish Link |
| domain | VARCHAR | 50 | Fish Domain |
| kingdom | VARCHAR | 100 | Fish Kingdom |
| phylum | VARCHAR | 100 | Fish Phylum |
| family | VARCHAR | 100 | Fish Family |
| species | VARCHAR | 100 | Fish Species |
| genera | TEXT | N/A | Fish Genera |

**Software Specification**

|  |  |  |
| --- | --- | --- |
| **Software Component** | **Required Specification** | **Compatibility Status** |
| Operating System | Windows 10 | Compatible |
| Programming Language | Javascript | Compatible |
| IDE | Visual Studio Code | Compatible |
| Database | MYSQL Workbench 8.0 CE | Compatible |

**Hardware Specification**

|  |  |  |
| --- | --- | --- |
| **Hardware Component** | **Recommended** | **Minimum** |
| Operating System | Windows 10 | Windows 10 |
| Processor | Intel Core i5 | Intel Core i3 |
| RAM | 8GB or higher | 4GB |
| Storage | 256GB or higher | 256GB |