Design of an Educational Application for Conservation and Ornamental Fish Capture Areas Based on Android

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Abstract

This study aims to develop an educational application centered on the conservation and ornamental fish capture areas in the Pangkajene Islands Regency. Designed for the Android operating system, the application is intended to be user-friendly and accessible to the local community. The testing phase will involve unit testing and compatibility checks to ensure that all functionalities work correctly and that the application performs smoothly across different devices and operating systems. The application will offer detailed information about conservation zones and ornamental fish capture areas within the Pangkajene Islands Regency. It will cover the types of ornamental fish in the region and provide guidelines for protecting the aquatic ecosystem. By delivering this information, the application is expected to be a valuable resource for the community, increasing awareness of the significance of aquatic ecosystem conservation and deepening understanding of ornamental fish conservation practices. This research contributes to the fields of environmental education and technology by creating a digital tool that enhances public awareness and knowledge about local conservation efforts. Utilizing the Android platform ensures broad accessibility, making the information available to a wider audience. Furthermore, the thorough testing processes outlined in this study underscore the importance of application reliability and device compatibility, which are crucial for effective educational content delivery. The research demonstrates how technology can be leveraged to support conservation initiatives, encourage sustainable practices, and aid in biodiversity preservation.

Keywords: Android; Conservation Area; Educational Application; Ornamental Fish Capture Area; Pangkajene and Islands Regency.

Introduction

Conservation and ornamental fish capture areas play an important role in preserving the aquatic ecosystem and ensuring the availability of natural resources for current and future generations (Buonocore et al., 2021). Many species of ornamental fish can be found in ornamental fish capture areas and have a high economic value (Kasmi et al., 2022). The aquatic ecosystem plays an important role in maintaining the ecological balance and providing benefits to the community such as water sources, food sources, and tourism (Kasmi & Karma, 2016).

Although conservation and ornamental fish capture areas play an important role, many people still do not understand the importance of these areas and how to preserve the aquatic ecosystem (Kasmi et al., 2021). Information about conservation and ornamental fish capture areas is often not available or difficult to access by the community, and limitations in access and technology skills make the information less widespread (Mastuti et al., 2022). Therefore, the community needs to have access to quality and easily understandable information about conservation and ornamental fish capture areas (Abdullah et al., 2021).

The development of technology has had a great impact on human life (Muttaqin et al., 2022). One example is the development of mobile operating systems, such as Android (Husain et al., 2020). Android is the most widely used mobile operating system in the world and has many features and applications that can make human life easier (Iskandar et al., 2022). Android has experienced rapid development since its launch in 2008. Currently, Android has undergone

many improvements in terms of features, design, and security. In recent years, many educational applications have been developed for the Android operating system, making it easier to access information for the community. The development of Android also opens up opportunities for the development of more innovative and beneficial applications for the community, such as educational applications about conservation and ornamental fish capture areas.

Several studies related to conservation and ornamental fish capture areas have been conducted, but less focused on the development of educational applications for the community. Related studies usually include studies of the types of ornamental fish found in ornamental fish capture areas, the condition of the aquatic ecosystem, and conservation actions that can be taken. To address these issues, an effective solution is needed to make it easier to access and understand information about conservation and ornamental fish capture areas by the community. One solution that can be applied is to design an educational application about conservation and ornamental fish capture areas.

Method

Agile Method is one of the systems development methods that are widely used today (Albers et al., 2020). This method is based on the Agile Manifesto philosophy which emphasizes collaboration, adaptation, and development together . In the Agile method, the system development is carried out repetitively and continuously, ensuring that the final result meets the expectations and needs of the user (Li et al., 2020). The Agile Method is very suitable for use in the development project of an education application for conservation and ornamental fish capture areas in the Pangkajene Islands Regency based on Android. In the Agile method, the development team works together with the client or user to ensure that the developed application meets the expectations and needs of the user. Each development stage involves the user to ensure that the final result meets their expectations and needs.

The use of the Agile Method in this project will ensure that the developed education application for conservation and ornamental fish capture areas has good quality and meets the expectations of the user. The development team can adapt to changes in user needs during the development process and ensure that the developed application has relevant and beneficial features for the user. The use of the Agile Method will accelerate the development process and ensure that the developed education application for conservation and ornamental fish capture areas has good quality and meets the expectations of the user.

Figure 1. Agile Methodology

The Agile system development stages in the development project of an education application for conservation and ornamental fish capture areas in the Pangkajene Islands Regency based on Android include several stages such as planning, needs analysis, design, development, testing, and maintenance. In the planning stage, the development team creates a development plan for the application and ensures that the application meets the expectations and needs of the user. The next stage is the needs analysis, where the development team analyzes the user needs and determines the features that must be present in the application. Then, the development team designs the application and carries out the development. Testing is conducted to ensure that the application works well and meets the expectations of the user. Finally, the development team performs maintenance to ensure that the application continues to work well and meet the expectations of the user.

Plan

The aim of this application is also to assist the community in obtaining information about conservation and ornamental fish capture areas in the Pangkajene Islands Regency. This educational application expects to raise awareness among

the community about the importance of conservation and ornamental fish capture areas. This application is also expected to help the community understand information about conservation and ornamental fish capture areas in the Pangkajene Islands Regency. In addition, this application is expected to be a useful source of information for the community in understanding the importance of conservation and ornamental fish capture areas.

Needs Analysis

In the development of the educational application for conservation areas and ornamental fish capture areas in Pangkajene and Kepulauan Regency based on Android, the hardware requirements needed include a computer or laptop with the following minimum specifications: Intel Core i5 processor or equivalent, 8GB or more of RAM, and around 256GB or more of hard drive storage space. This device must have sufficient memory capacity and storage space to accommodate the data and files needed in the development process. In addition, a stable internet connection is also required to facilitate access to information and collaboration among members of the development team.

In addition, some of the software required include Integrated Development Environment (IDE) such as Android Studio, supporting software such as Git for managing source code, and user interface design software such as Adobe XD. The minimum specifications for an IDE like Android Studio include 8GB or more of RAM, around 256GB or more of hard drive storage space, and an operating system such as Windows 7 or a later version. The development team also requires software for testing and testing such as the Android Virtual Device (AVD) or physical hardware for testing the application on an Android device.

Design

The design of the conservation and ornamental fish capture area educational application system in Pangkajene and Kepulauan Regency can be applied using a Use Case Diagram. The development team will have a clear visualization of how the application will work and meet the needs of users. This also helps in ensuring that all required features will be implemented and ensures that the application will work efficiently and effectively. The following figure 2 shows the Use Case Diagram from the research.
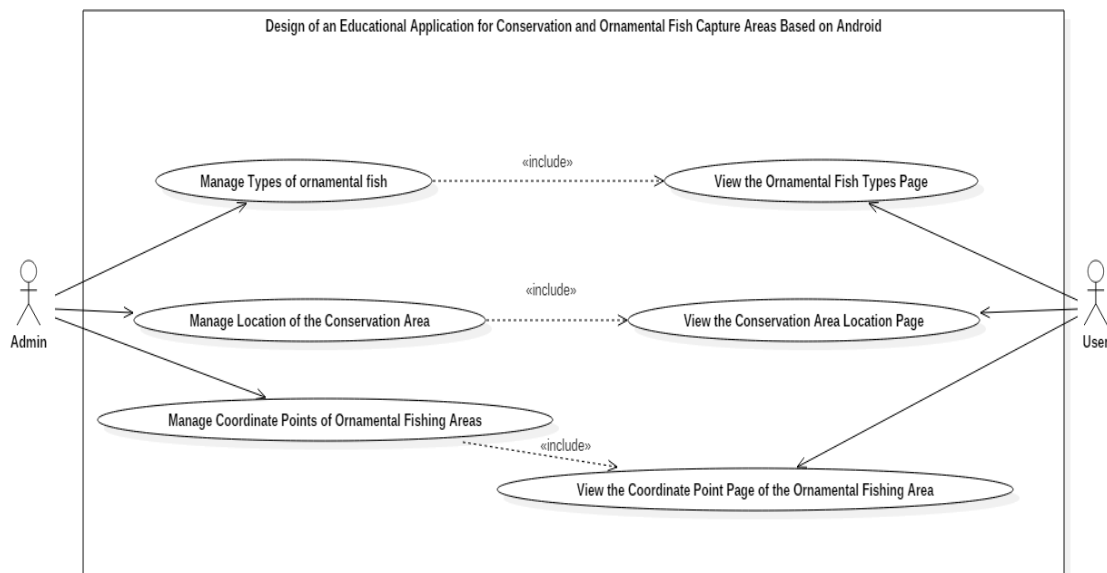

Figure 2. Use Case Diagram

Figure 2 provides a visualization of the role of each actor in the conservation and ornamental fish capture area educational application system. The Admin actor can manage and modify information in the system, such as adding or deleting ornamental fish types, and conservation areas, and coordinate points of ornamental fish capture areas. Meanwhile, the User actor only has access to view the information available in the system. This helps in maintaining

the integrity and security of the system's information and ensuring that the information displayed in the application is accurate and trustworthy.

Results and Discussion

Result

This system was developed using the Android Studio application with Kotlin programming language, resulting in a user interface that will be used by the user. Users can view information such as information on ornamental fish species, conservation area locations, and fishing point coordinates in Pangkajene and Kepulauan Regencies. A user-friendly interface and easy-to-use features will make it easier for users to access and understand information about conservation areas and ornamental fish catch in the area. With this application, the developers aim to raise public awareness about the importance of conservation areas and ornamental fish catch, as well as provide a useful source of information for the community.
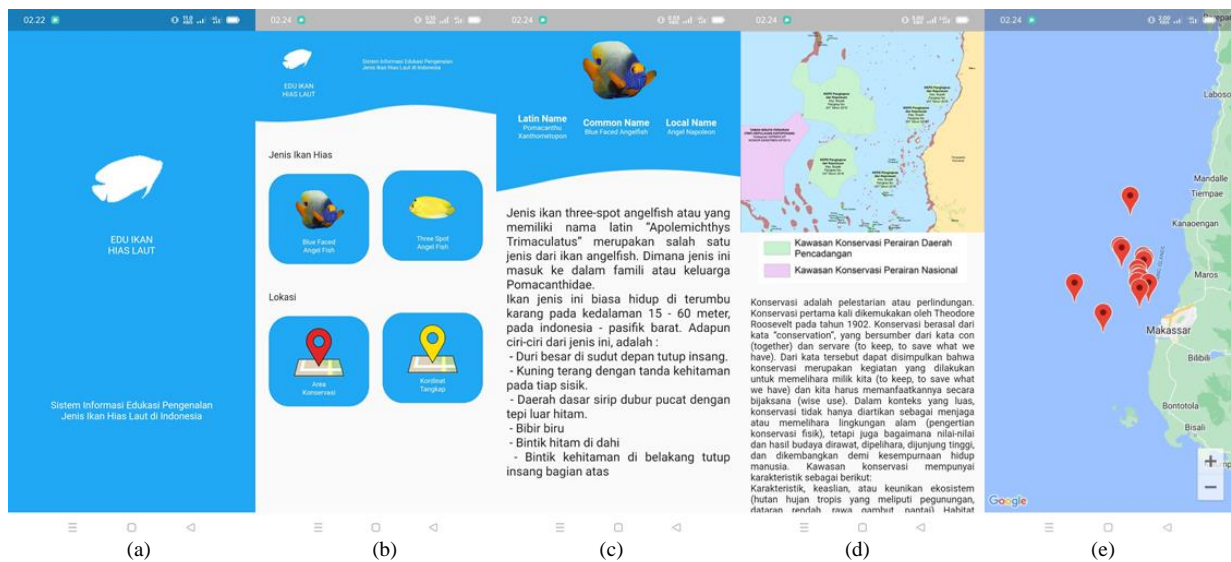

Figure 3. User Interface

Figure 3 illustrates five images, among them (a) displays the Splash Screen page when the user opens the application, (b) displays the main page showing information about the type of ornamental fish, the location of the conservation area, and the coordinates of the ornamental fish capture area. (c) displays the detail page of the type of ornamental fish such as Latin Name, Common Name, and Local Name, and contains a description of the type of ornamental fish. (d) displays information about the conservation area and a description of the conservation area. (e) displays the coordinates of the ornamental fish capture area.

System Testing

Testing the system is a crucial part of the development of an application. By conducting tests, it can ensure that the system functions as expected and meets the needs of users. In this research, two testing methods were used, namely Unit Testing and Compatibility Testing, to test the system.

Table 1. Unit Testing.

System Components	Description Test	Results
Manage Ornamental Fish Type Data	Perform tests on the process of adding, editing, and deleting, on the ornamental fish type page	Succeed
Manage Conservation Area Data	Test the process of adding, editing, and deleting, on the conservation area page	Succeed

System Components	Description Test	Results
Manage Ornamental Fishing Coordinate Point Data	Perform tests on the process of adding, editing, and deleting, on the page of the coordinate points of ornamental fishing	Succeed

The Unit Testing in Table 1 is an important step in the development of the conservation area and ornamental fish capture area education-based Android application. This test involves testing each smallest part or module of the application, to ensure that each part works well and meets the specified specifications. Based on the testing results in Table 1, it can be seen that the system does not have any errors and works optimally.

Table 2. Compatibility Test.

Component/Feature	Tested Devices/OS	Test Result
Splash Screen	Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, Oppo A5s	Pass
Main Page	Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, Oppo A5s	Pass
Detail Page	Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, Oppo A5s	Pass
Conservation Page	Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, Oppo A5s	Pass
Coordinate Page	Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, Oppo A5s	Pass

Compatibility Testing in Table 2 is a critical testing process to ensure that the Android-based conservation and ornamental fish capture area education application works well on various devices. The aim is to ensure that the application can run optimally and meet the specified specifications on various Android devices such as the Realme 3 Pro, Samsung Galaxy S9, Xiaomi Redmi Note 7, Google Pixel 3 XL, and Oppo A5s. The results of testing in Table 2 show that all components and features can be tested without any errors or bugs.

Discussion

The results of this research show that the development of an Android-based conservation and fish catch area education application can help to enrich people's understanding of the importance of conservation areas and fish catch areas. This is in line with the basic concept that educational applications can help to increase public awareness about environmental issues (Pedro et al., 2019). This result is also to the research of (Simmance et al., 2022) that education on fish species in conservation areas and information on fish catch areas can provide benefits in improving the well-being and awareness of the public.

Conclusions and Suggestions

Conclusions
Based on the results of this research, it can be concluded that the development of a conservation and ornamental fish capture area education application based on Android can help in enriching the public's knowledge about the importance of conservation and ornamental fish capture areas in Pangkajene and Kepulauan Districts. The user-friendly interface and easily used features make it easier for users to access and understand information about conservation and ornamental fish capture areas in the region.

The results of Unit Testing and Compatibility Testing show that the system runs well and meets the specified specifications. This indicates that the application is reliable and can be a useful source of information for the public. Overall, the development of this application helps in advancing the conservation and ornamental fish capture in Pangkajene and Kepulauan Districts, as well as enriching the public's knowledge about it.

Suggestions
Based on the results of this research, the following suggestions for the development of the Android-based educational application for conservation and ornamental fish capture areas are as follows:
1. Additional useful features for users, such as a location search feature for conservation and ornamental fish capture areas, and a fish species search feature based on Latin name, common name, or local name, should be developed.
2. Regular evaluations and improvements should be made to the system to ensure that the application works optimally and meets user needs.
3. Newer, better technology should be applied to allow for more efficient and effective application development.

4. Promotion and education should be carried out with the public about the importance of conservation and ornamental fish capture areas, and how the application can help them obtain information about these areas.

It is hoped that this Android-based educational application for conservation and ornamental fish capture areas will continue to grow and provide maximum benefits to the public.

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