Betta Fish Farming Information System Based on Android Applications

A Hendrizal 1*, I Lesmana 2, M A Wibowo 3, M Fauzi 1, Budijono 1
1) Aquatic Resources Management Department, Fishery and Marine Science Faculty, Universitas Riau
2) Aquaculture Department, Fishery and Marine Science Faculty, Universitas Riau
3) Marine Science Department, Fishery and Marine Science Faculty, Universitas Riau
*Corresponding Author: andri.h@lecturer.unri.ac.id

Abstract. The challenge in developing an ornamental fish culture in Indonesia is the lack of a trusted source of information that can be used by the wider community. This lack of information became the reason for the failure of ornamental fish culture, including betta fish. This study aims to design an Android-based betta-fish culture information system that can be used by the wider community. The method used in this study is a mixed-method, through the development of an android application to gather information about betta fish farming. Data collection related to biology aspect and factors that influence betta fish culture is done through secondary data collection. All information collected will be entered into an android-based information system. Android applications will be developed using the Java programming language by using the android studio as the official integrated development environment (IDE) for Android application development. The results of the Android-based betta-fish culture information system design will be displayed on the main menu form consisting of betta fish potential, cultivation (details of cultivation and their needs), list of betta fish varieties, and betta fish trading. This application is expected to help the community to access information on betta fish culture to be more productive and efficient. Android based betta fish information system will help ornamental fish breeder to get information needed for success breeding.

1. Introduction

Indonesia is one of the countries in Southeast Asia which is known to have great potential for ornamental fish. Ornamental fish is a type of fish that lives in fresh water and sea which has an interesting body shape and color [1]. Betta fish is a type of ornamental fish that lives in fresh water. There are at least 49 types of Indonesian Betta fish that have been identified [2]. This type of fish has high economic value because it has beautiful colors and various forms [3].

Indonesia, as one of the natural habitats for betta fish, has great potential in the development of betta fish farming. Developing ornamental fish culture such as betta fish, face a challenge because of the lack of trusted source of information that can be used by a wider community. Research by [4] states that ornamental fish cultivation must pay attention to water quality, food, disease prevention to certification. The potential of ornamental fisheries in Indonesia requires support in the form of collecting information on research results so that they can be collected and managed properly using an information system. The use of this information can be useful for many parties [5]. For example, the general public can use this information to determine the prospects for ornamental fish business. The use of information technology in disseminating research results related to ornamental fish cultivation has not been optimally utilized.

Mobile phone has become one of the important aspects for human. The advance technologies in mobile phone made human life easier and smarter. Fishery is also one sector that also influenced by mobile phone development. [6] show some mobile application that has been developed in fisheries sector.
Table 1. Android Application in Fisheries Sector

| No | Application Name    | Features                                      |
|----|---------------------|----------------------------------------------|
| 1  | Fishing point       | Showing best fishing times and weather condition |
| 2  | Fish brain          | Fishing locations, News feed about fishing    |
| 3  | Fish hunter pro     | GPS tracking. Fishing planning                |
| 4  | Fishing and hunting | Advise best fishing time                      |

Ornamental fish breeder, especially betta fish, could use the mobile application for successful breeding. It is not only provide guidance but also a tools to enhance the farming fish experience and expand the knowledge of ornamental fish farming. In Indonesia, the effect of advance technologies for fisheries are still wide open for more exploration.

2. Method
The methodology used to design an android application for betta fish farming begins with secondary data collection through literature studies. This stage helps collect data and information regarding the results of research in the field of betta fish farming. All information collected will be entered into an android-based information system. Android applications will be developed using the Java programming language by using the android studio as the official integrated development environment (IDE) for Android application development. The next stage is designing an information system based on an android application using Rapid Application Development (RAD). The stages of developing an android application using the RAD method are: Identification of the requirement plan, system design, implementation (coding) and testing.

3. Result and discussion
3.1. Biological Aspects of Betta Fish
Betta fish is one of the original ornamental fish from Indonesia. Betta fish habitats is in the tropical regions of Sumatra, Kalimantan and Malaysia [2]. The systematics and classification of ornamental bettas [7] are as follows:
- Kingdom: Animalia,
- Phylum: Chordata,
- Subphylum: Vertebrates,
- Class: Osteichthyes,
- Order: Perciformes,
- Suborder: Anabantoidei,
- Family: Belontiidae,
- Genus: Betta,
- Species: Betta sp.

Betta fish have a high economic value because of their attractive color. This attractive color is caused by chromatophore pigment cells in the skin of the fish [8]. In addition, betta fish are also popular because their cultivation does not require a large area of land [3]. Male bettas have an attractive body color, longer fins and a slimmer body [2].

3.2. Factors Affecting the Survival of Betta Fish
Betta habitat characteristics: pH 6.5-7.5; water hardness 5-12 dH, water temperature 24-30 C, able to live in oxygen-poor areas because it has a maze [7]. Feed is one of the factors that need attention in the cultivation of Betta fish. Betta fish feed during maintenance is mosquito larvae, water fleas, worms and infusoria [2]. The problem in betta fish farming is the high rate of seed mortality due to the type of feed that is not suitable for digestion and mouth size [3]. Therefore, it is necessary to pay attention to the suitability of the feed size with the mouth size of the Betta fish. Betta fish that often eat silk worms have
rapid growth. This is because of the high fat content. Meanwhile, betta fish that consume blood worms show a very active reaction and eat them quickly. This is because of the fishy smell of blood worms [8].

3.3. Android Application Design
The android application design will be carried out in stages according to the RAD. The purpose of developing this android application is as a center for information and data related to Betta fish cultivation. This application is made so that the dissemination of information related to betta fish cultivation can be done quickly and efficiently.

Furthermore, a system requirements analysis is carried out. The android application will present information on betta fish cultivation related to biological aspects and factors that affect the cultivation of Betta fish. This system will present data related to the type of feed and chemical physics factors related to Betta fish.

The third stage is the design process. In this process, buttons and information functions will be designed. The design of the interface is carried out with the aim that the data that has been inputted becomes an informative input display.

The last stage is testing. At this testing stage, all the functions and features in the application are carefully observed.

| No | Test Case                        | Expected Result                                      | Result     |
|----|----------------------------------|------------------------------------------------------|------------|
| 1  | Splash screen                    | Viewing main page                                    | Matched    |
| 2  | Menu of Biology Aspect           | Viewing biology aspect of Betta Fish                 | Matched    |
| 3  | Menu of Aquaculture Factor       | Viewing factor that affect Betta Fish aquaculture, including disease. | Matched    |
| 4  | Menu of Betta Fish Aquaculture Tools and Needs | Viewing tools and needs for Betta Fish aquaculture | Matched    |
| 5  | Contact and Suggestion           | Viewing contact information and suggestion from visitor | Matched    |
Figure 1. Design of Betta Fish Android Application

Android based information system in fishery sector is still limited and has to be explored. This information system can be used by the breeder to know about the water quality, biological aspect of betta fish and any other information needed for successful breeding. Whether amateur or profesional ornamental fish farmer could log in to the android based information system for more productive and efficient farming.

4. Conclusion
The greatest development of mobile phone technologies affect almost every sector, including fisheries. Fisheries sector is still understimated which means there are still many potential to be explored. From this research we can conclude that the development of betta fish aquaculture information system could be a tool to help wider community to develop the ornamental fish farming, especially Betta fish. Android based betta fish information system will help fish breeder to get information needed for success breeding.

Reference
[1] Fauzan, M., Sugihartono, M., Arifin, M.Y. 2018. Perbedaan Waktu Pemeliharaan Telur dan Larva Oleh Induk Jantan Terhadap Daya Tetas dan Kelangsungan Hidup Larva Ikan Cupang (Betta splendens). Jurnal Akuakultur Sungai dan Danau Vol. 3 No 2 Tahun 2018 Hal 76-81.
[2] Kusrini, E., Sudarto, Kusumah, R. V. 2010. Aspek biologi dan reproduksi ikan cupang alam (Betta bellica) dan potensi budi dayanya. Prosiding Seminar Nasional Ikan VI: 197-200.
[3] Asniati, Manik, I.G.A., Wardoyo, S.E. 2013. Kajian Berbagai Jenis Pakan Terhadap Pertumbuhan Benih Ikan Cupang Bagan (Betta imbelis var. Sumatranensis). Jurnal Sains Natural Universitas Nusa Bangsa Vol. 3 No. 1 Januari: 86-100.

[4] Monvises, A., Nuangsaeng, B., Sriwattanarothai, N., Paniijpan, B. 2009. The Siamese Fighting Fish: Well-known Generally But Little Known Scientifically. ScienceAsia 35: 8-16.

[5] Reniban, L. E. 2019. Sistem Informasi Inventarisasi Sumberdaya Perikanan Kabupaten Maluku Tenggara Dengan Metode Rapid Application Development. Jurnal Teknik Komputer AMIK BSI Vol. 5 No. 2: 241-249.

[6] Amrita, C. M. & Karthickumar, P. 2016. Need For Mobile Application in Fishing. International Journal of Science, Environment and Technology Vol 5 No 5: 2818-2822.

[7] Ladyescha, D., Nugroho, R.A., Dharma, B. 2015. Uji Efektivitas Ekstrak Cair Daun Ketapang (Terminalia catappa Linn.) Sebagai Antibakteri Terhadap Ikan Cupang (Betta sp.) Yang Diinfeksi Bakteri Salmonella enterica serovar Thypi. Prosiding Seminar Sains dan Teknologi FMIPA Unmul: 27-34.

[8] Susantie, D., Manurung, U. S., Kase, I. O.k. 2018. Tingkah laku ikan cupang (Betta splendes) terhadap pakan yang berbeda. Jurnal Ilmiah Tindalung Vol. 4 No 2 November: 83-88.