

**Fish Care- A Modern Solution for Fish Farmers**

**BY**

**Khan Muhammad Al Araf**

**ID: 172-15-10166**

**Md Mahfuzur Rahman**

**ID: 172-15-10157**

**AND**

**Md Riad Shah**

**ID: 172-15-9855**

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering.

Supervised By

**Mr. Asif Uz Zaman Asif**

Lecturer

Department of CSE

Daffodil International University

Co-Supervised By

**Shadaab Kawnain Bashir**

Lecturer

Department of CSE

Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

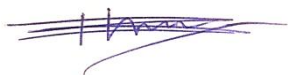
**DHAKA, BANGLADESH**

**JUNE 2021**

## APPROVAL

This Project/internship titled **“Fish Care – A Modern Solution for Fish Farmers”**, submitted by **Khan Muhammad Al Araf**, ID No: 172-15-10166, **Md Riad Shah**, ID No: 172-15-9855 and **Md Mahfuzur Rahman**, ID No: 172-15-10157 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **June 3, 2021**.

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Faculty of Science & Information Technology  
Daffodil International University

Aniruddha Rakshit

---

**Aniruddha Rakshit**

**Senior Lecturer**

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

**Internal Examiner**



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**Dr. Mohammad Shorif Uddin**

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Department of Computer Science and Engineering

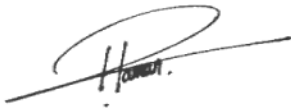
Jahangirnagar University

**External Examiner**

## DECLARATION

We hereby declare that, this project has been done by us under the supervision of Mr. **Asif Uz Zaman Asif, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

### Supervised by:



---

**Asif Uz Zaman Asif**  
Lecturer  
Department of CSE  
Daffodil International University

### Co-Supervised by:



---

**Shadaab Kawnain Bashir**  
Lecturer  
Department of CSE  
Daffodil International University

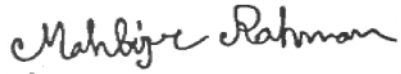
### Submitted by:



---

**Khan Muhammad Al Araf**  
ID: -172-15-10166  
Department of CSE

Daffodil International University



---

**Md Mahfuzur Rahman**

ID: -172-15-10157

Department of CSE

Daffodil International University



---

**Md Riad Shah**

ID: -172-15-9855

Department of CSE

Daffodil International University

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## **ABSTRACT**

Fishing in Bangladesh is the main source of animal protein and the second dominant economic activity in Bangladeshi agriculture. According to industry estimates, fish production will reach 5.02 million metric tons in 2020-21. The Bangladesh fisheries sector has been earning a considerable amount of foreign exchange. In 2013-14, the country earned 4,776.92 basic BDT by exporting 77.33 thousand MT of fish and fishery products. These are the highest export earnings in the last 10 years, as of 2017. In fiscal year 2016-17, the sector earned BDT 4,287.64 crore from exporting nearly 68.31 thousand tonnes of fish and fishery products. (B.V., 2020) The problem is over pollution and imbalance of the elements in water decrease the productivity of fish in every single year. Even the owner of the fisheries does not have the idea about the reasons. To make a significant change in increasing fish productivity and digitizing fish farming, we have chosen this research-based project. After research we have made an android based application that can act as an advanced fish care tool or as fish doctor from which we can get knowledge about fish details and get to know about the water we are using for farming our fish is being suited perfectly.

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# CHAPTER 1

## Introduction

### 1.1 Introduction

This report will communicate about the features and the technique to fabricate the application that we think and function admirably to arrive at the last acknowledgment. This assertion particularly remains in nuances for objectives, perception of construction, scope, fundamental essentials, and toward the end report and notice the strategies that are set.

One of the most vital disappointment for our modern technology that is day by day our technology is being improved heavily day by day even we are planning to stay in the moon or in the mars. Then again we human being created modern applications to make our life easier. Eillon Mask even created Space X to create other planet as livable as our mother earth. But the question is how much technological experiment we did in last 12 years to improve our agricultural growth? On the perspective of other countries, it is not a decent number for sure except Nordic countries and few other rich countries. Still by comparing with other technological investment it's not enough. Then again for the 3<sup>rd</sup> world country like us do not even invest enough on this section where agricultural sector full fills our 1<sup>st</sup> basic right that is food. That's why this project is an effort to obtain sustainable development goal by working based on agricultural project.

### 1.2 Motivation

Now, we look at the scenario in google play store there are **2.87 million** apps available for download on the Google Play Store. Now the question is how many of them is for improve our agricultural fact? We are not sure but the number will surely disappoint us again. Well as we are the student of Computer Science and engineering we have researched about the least careful agricultural sector and that is Fish. As there is no specific fish care based application in play store for our farmers we have decided to create an android based application in our language. Now the question is does the application can solve all the fish farming based problem? Technically no but yes there is

something extraordinary can be done by this application. That is all the basics about the fish farming can be known by this application.

### **1.3 Objective**

Our project will ensure the quality of water and fish of the pond. Here we are providing all the information of the fish. We can get to know about the quality of water from the application. After getting the value of the pH and other elements of the water it will give a suggestion for the fish so that the farmer will be able to prevent the death rate of the fish and get the cure too. Again the application will provide the quality food system for different fish. Suggestion for fish medicine are also given in the application. For the emergency of fish problem fish helpline is also given in the application. And lastly by using internet farmers can know the latest news about fish farming and fish farming technology(Arju, 2019).

### **1.4 Expected Outcome**

This project can help farmers to have all the information about fish farming so that in the long run this project will decrease the death rate of fish farming. This project will help the farmer to be updated with the generation and new technology. Over all this project will act as a fish doctor that will change the fish farming experience.

### **1.5 Report Layout**

This undertaking contains six sections.

**Chapter 1:** In the primary section called Introduction, we will discuss the Introduction, inspiration, destinations, anticipated outcome, and plan of the report.

**Chapter 2:** In the second part entitled Background, we will expound on the presentation of the task, related works, Comparative investigations, difficulties of our undertaking.

**Chapter 3:** The third part called Requirement detail. Contains business measure demonstrating, prerequisites investigation, and assortment, displaying and depiction of utilization cases, plan necessity of our task.

**Chapter 4:**In the fourth part called Design Specification, where we will discuss Front-end Design, Back-end plan, and execution prerequisites for our task.

**Chapter 5:**In the fifth section, whose name is Implementation and Test. Here, we will talk about the execution of Database execution, association, and testing execution.

**Chapter 6:**In our 6th section, the last part called the Conclusion and future extent of our task. In this part, we will discuss the Discussion and Conclusion, and Scope for Future Development. Around there, we talk about our application and its different issues, arrangements, and venture utilizations.

## CHAPTER 2

### Background

#### 2.1 Introduction

As Fish is one of the most common sector of getting protean for our human body fish firming exists in the world from the very beginning. After that fish firming has become a largest source of income for our country and also all over the world. Now a days it has become one of the most earning export import business too.

Let's go back to 20 years before internet has seen the best of its revolution at that time the existing farmers of our country was illiterate. But now in 2021 the technology and literacy rate are higher than before. But still if we have a look in the total income we have gained from the fish firming field it's decreasing year by year which is a biggest threat for our GDP and the whole fish firming sector. Let's have a look a statistics of earning money from sector fish(Sultana, 2019).

Year	Source-wise production		Other fish products		Total
	Quantity (MT)	Value (Crore Taka)	Quantity (MT)	Value(Crore Taka)	
20017-2018	36167.77	3527.07	32767.93	782.87	4309.94
2016-2017	39705.85	3682.26	28599.83	605.38	4287.64
2015-2016	40726	3598.67	34612	684.15	4282.82
2014-2015	44278	3937.60	39246	723	4660.60
2013-2014	47635	4118.80	29693	658.12	4776.92

**Table 1.1 : Fish Production in Bangladesh**

Well this doesn't describe the whole scenario. According this scenario as far we see the facilities and the area of fish firming by owner is increasing day by day but the production rate of the fish firming is decreasing. Our application is standing exactly standing for this. To give a solution and a proper guideline to our fish farmers to produce our optimal needed fish firming goal.

## 1.2 Related Work



**Fig 2.1 : Related Work**

As we know that fish farming in Bangladesh is not a new issues and it has never been new from the beginning of the human history and the farmers are having problem since they collect fish. So that from the beginning of the application based problem solving developers has made several of the application to solve the problem that we had about fish farming. A few of application about fish farming are found in google play store. The best of them are mentioned here.

In those all the application contains the information about the specific of the fishes.



Those applications really help me to gain knowledge about the lacking of the application and what new should be added in my project.

## 2.3 Comparative Studies

Let's have a look in the fisheries information of our country so that we will have an idea how large is the industry and how much opportunity we have to work on this sector.

### FISHERIES RESOURCES INFORMATION ON BANGLADESH (fisheries.gov.bd, 2021)

Water Area			
(a)	Closed Water Body (Culture based)		7,97,851 ha.
	i) Pond & Ditches :		3,91,753 ha.
	ii) Oxbow lake :		5,488 ha
	iii) Shrimp Farm :		2,58,681 ha
(b)	Open Water Body (Capture based)		39,27,142 ha
	i) River & Estuaries (without Sundarban)		8,53,863 ha
	ii) Beel		1,14,161 ha
	iii) Kaptai Lake		68,800 ha
	iv) Flood Plain :		27,12,618 ha
(c)	Marine Fisheries		
	i) Territorial Water :		2,680 sq. n. miles
	ii) Exclusive Economic Zone :		41,040 sq. n. miles
	iii) Continental Shelf		24,800 sq. n. miles
	iv) Coast line :		710 km.

2.	Fish Production	42,76,641 mt.
	i) Open Water (capture) :	12,16,539 mt.
	ii) Closed Water (Culture) :	24,05,415 mt.
	iii) Marine Fisheries	6,54,687 mt.
3.	(a) Export of Fish & Fish Products	
	i) Quantity	68,935.72 ton.
	ii) Value (BDT)	4309.94 crore
	iii) Contribution to export earning :	1.5%
	(b) No. of Fish Processing Plants :	100
	(c) No. of EU approved Plants :	76
4.	Contribution in GDP	3.57%
5.	Fish Intake/Demand	
	i) Per capita Annual Fish Intake :	21.90 kg.
	ii) Annual Total Fish Needed :	42.38 lakh mt.
	iii) Contribution in Animal Protein supply :	60% (App.)
6.	Fish Hatchery/Nursery	
	i) Fish hatchery :	926 (Govt. No 102)
	ii) No. of Fish Nursery :	926 (Govt. No.102)
	iii) Fingerling Production :	236.2 lac

**Table 2.3 : Fish income and details in Bangladesh**

## 2.4 Challenge

To reach in our final goal there we have faced some challenges. The challenges are given bellow :

1. Not all the information is found in internet.
2. Getting the confirmation from the authentic sources is tough because all the website doesn't contain similar information.
3. As there are a number of variations found in internet we verified the information from the government institution for fishing during this corona time which is not that much easy.
4. User friendly UI and make it understandable for the farmers was one of the primary challenge.

# CHAPTER 3

## REQUIREMENT SPECIFICATION

### 3.1 Business Process Modeling

As our primary purpose of building this application is to help the fish farmer we have created an easy and most fitting model. User go to the application and see the home page and the home page basically contains 7 different buttons. 6 of them is on the pepose helping farmer. And last of them is for copyright.

Now come to the point the fish information page contains 10 different button to get the information about fish. The button “Fish Food” contains the information about the food of the fishes. “Fish disease” Button stands for providing the fish disease informations. “Help Line” Button stands for the contact number of all the government institute. “Fish Suggestion” button stands for giving the suggestion about the water that is the most vital part of our application. It will take the input value from the user about PH value, Nitrogen value,Oxygen value, Temperature value after getting the value from these our application will give a smart solution for the pond. That will reduce the water pollution and make the fish healthy keep the fish safe from disease lastly prevent the death rate of the fish.

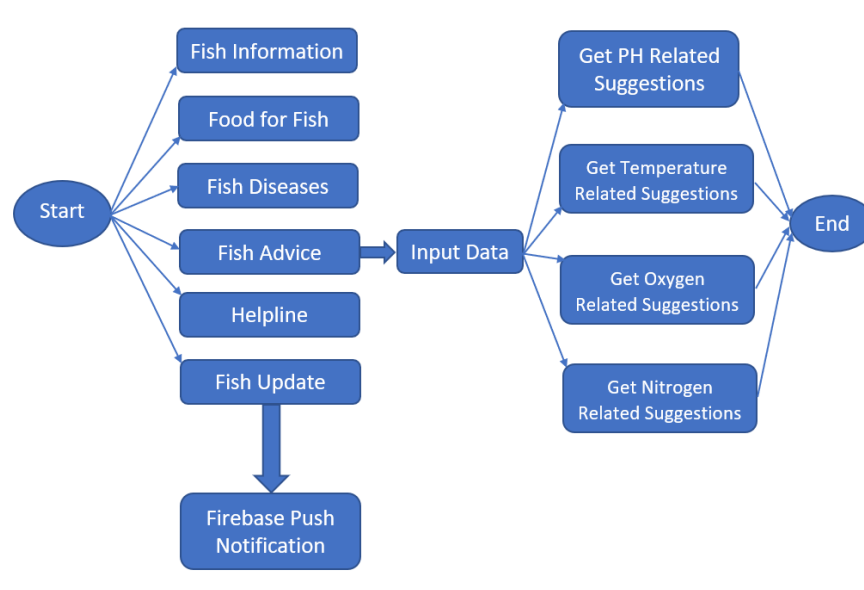


Fig : 3.1 Business Process Modeling

## 3.2 Requirement Analysis and Collection

### 3.2.1 Software Requirements:

**Android Studio IDE:** Android Studio is Android's true IDE. That offers custom devices for Android designers including rich code altering, debugging, Testing and Profiling Tools.

**Android Virtual Device:**AVD is an Android Virtual Device (AVD) a gadget setup running on the Android emulator. Gives virtual Android climate explicit to the gadget where we can introduce and test our Android Solicitation.

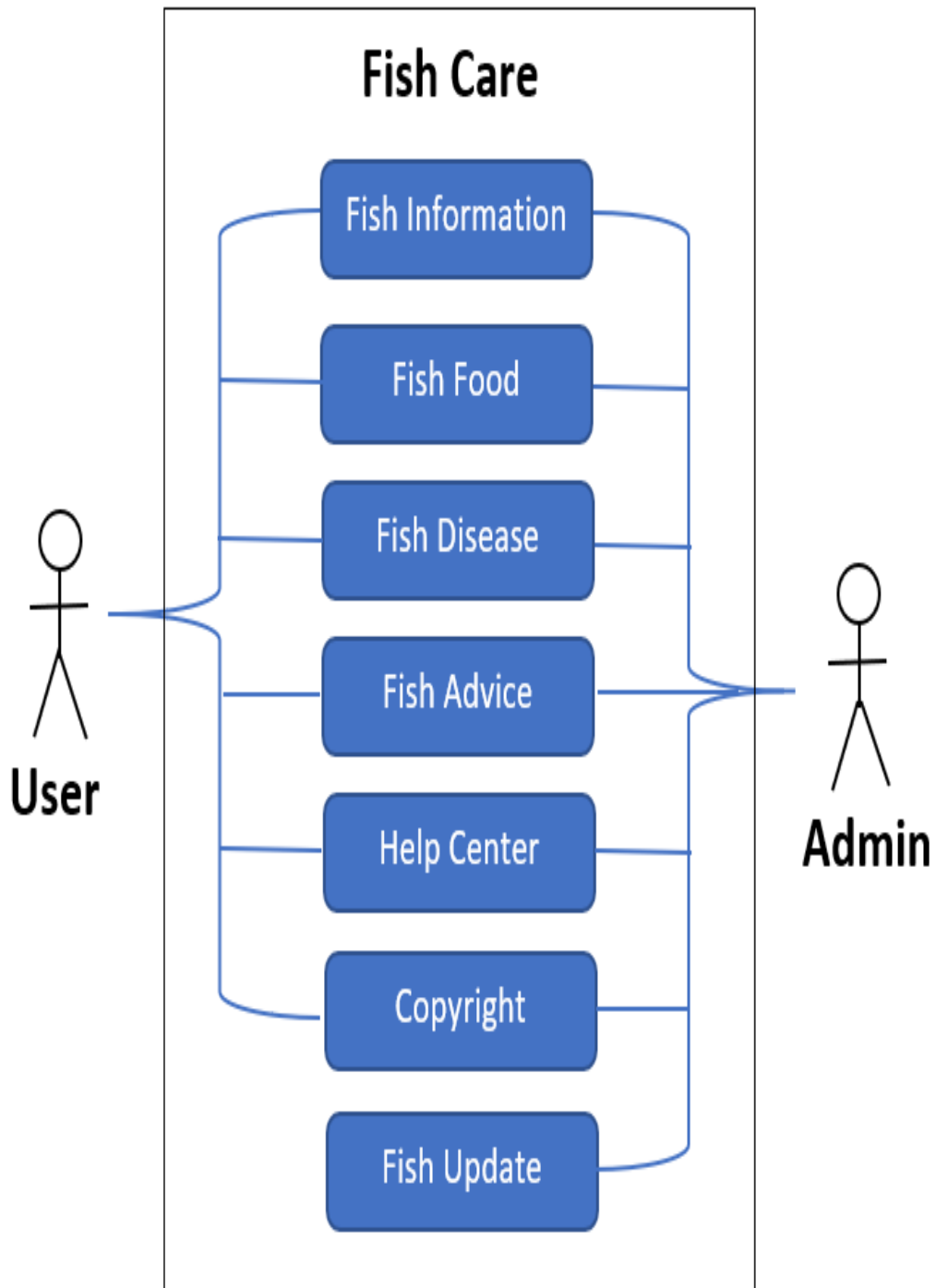
**Database (Firebase):** Firebase Cloud Messaging (FCM) gives solid The force saving association between the worker and the gadget permits you to Convey and get messages and warnings on iOS, Android and the Web, the URL is free. You can send warning messages (most extreme 2KB) and information messages (4KB) limit).

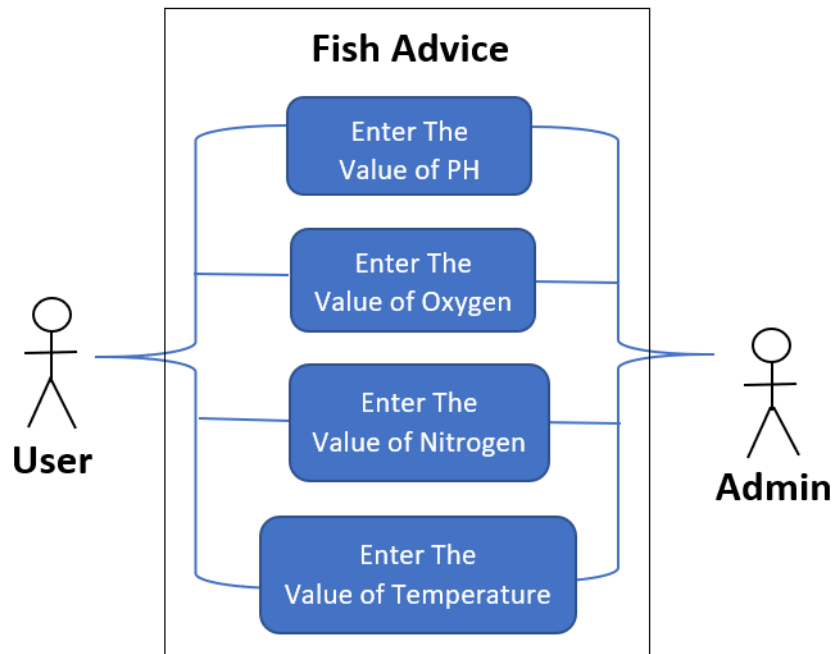
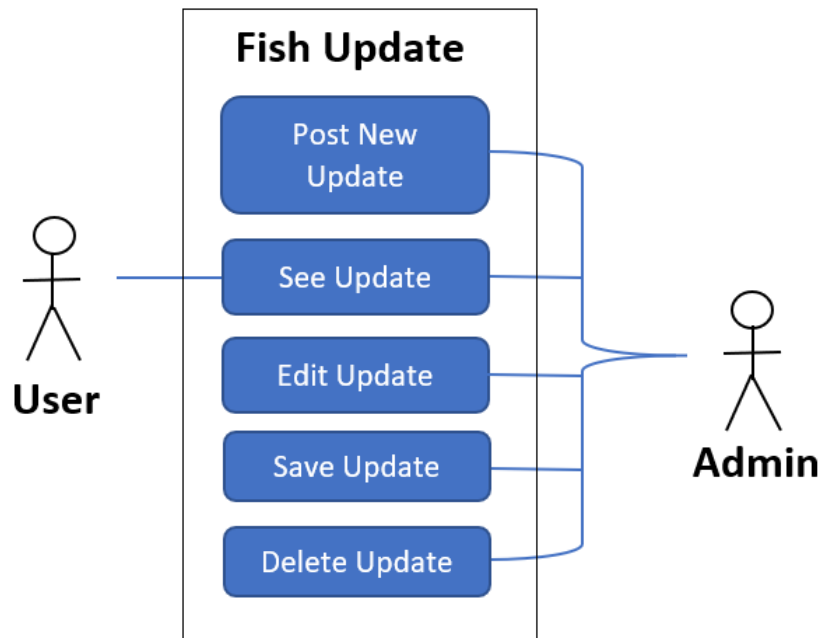
**Adobe XD:** Adobe XD is Adobe's prototyping apparatus for the client experience and collaboration architects. Adobe XD highlights are utilized to make wireframes, models and screen plans for advanced items, like sites and cell phones applications.

### 3.2.2 Hardware Requirements:

- Operating system: Windows 7,8,10.
- Android supported device.
- Computer configuration:
  - RAM-8GB (min)
  - Hard Disk- 150GB (min)
  - Processor- 1.5GHz (min)

### 3.3 Use case Diagram :





**Fig : 3.3 Use case Diagram**

### 3.4.1 Use case details:

#### Use case of Fish Information:

**Table: 3.4.1**

<b>Use case name</b>	Fish Information
<b>Use case details</b>	User will see the information about the fish.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	None

#### Use case of Fish Food:

**Table: 3.4.2**

<b>Use case name</b>	Fish Food
<b>Use case details</b>	User will see the information about the fish food.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	None

#### Use case of Fish Disease:

**Table: 3.4.3**

<b>Use case name</b>	Fish Disease
<b>Use case details</b>	User will see the information about the fish Disease.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	None



**Use case of Fish Advice:**

**Table: 3.4.4**

<b>Use case name</b>	Fish Advice
<b>Use case details</b>	User will see the information about the fish Disease.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	Must put the value from user and app will give a result.

**Use case of Help Center:**

**Table: 3.4.5**

<b>Use case name</b>	Help Center
<b>Use case details</b>	User will see the Numbers of fish institute.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	None

**Use case of Copyright:**

**Table: 3.4.6**

<b>Use case name</b>	Copyright
<b>Use case details</b>	User will see the copyright information.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User
<b>Post-condition</b>	None

**Use case of Fish Update:**

**Table: 3.4.7**

<b>Use case name</b>	Fish Update
<b>Use case details</b>	User will see the Latest information about fish.
<b>Pre-condition</b>	Open application
<b>Actor</b>	User- To see the update, Admin- Provide update.
<b>Post-condition</b>	None

## CHAPTER 4

### DESIGN SPECIFICATION

Basically an application contains two design specification. They are,

- Front-End Design.
- Back-End Design.

#### 4.1 Front-End Design

Front-End design basically contains the basic structure of the application on the other hand we can call it as it is the android or app based implementation of our UI. Then again it can be call the user view of the application which is designed by XML.

##### 4.1.1 Splash Screen



**Fig 4.1.1: Splash Screen**

Splash Screen is the beginning page of our application where it has been starting with a short graphical animation view which is getting ups and downs between 5 dp to 15 dp

size in the screen. This action only given for the decoration purpose there are no other specific task was given there.

#### 4.1.2 Home Page



**Fig 4.1.2 : Home page**

The home page Basically contains a page which is created with seven different buttons which will fulfill our optimization of our computer. The brief description of these seven button was already given to the previous chapter. Here we are going to describe the whole scenario with the graphical representation of the button and we will know how do the button works. So that the home page contains a simple design as we pick the farmers as our primary user so that an easy UI will help us to achieve our goal.

### 4.1.3 Fish Information(মৎস্যতথ্য)



Fig: 4.1.3 Fish Information (মৎস্যতথ্য)

The farmers should have gained enough knowledge about the fish that he is planning to firm. So that our application will enrich with the information about fish so that the farmer will be enriched by the information that he must know about the fish he may firm. Now the button “মৎস্যতথ্য” contain 10 different button. Every single button contains one of the fish information. We have dedicatedly selected 10 most popular fish of our country and these 10 buttons contains the information of these 10 most popular fish.

### 4.1.4 Fish Food (মাছেরখাদ্য)

Farmer should gain knowledge about the food system of the fish to get a better healthy fish from his firm. For that purpose we have designed the application format with 10 button for those above mention fish so that farmers will get to know what food he will buy for his pond and also the fish will rise quickly and the death rate will be decrease than before.



Fig : 4.1.3 Fish Food (মাছেরখাদ্য)

### 4.1.5 Fish Disease (মাছেররোগ)



Fig: 4.1.5 Fish Disease (মাছেররোগ)

As far Farmers get the information of the fish farmers will start fish firming and the first challenge he will get is the disease of the fish. A huge amount of fish died due to the various disease in every year. Even though technology has come to its best level still the most death rate of the fish is occurred for the common disease. That’s why we have given 14 different button here to describe about the common disease of the fish in our country.

#### 4.1.5 Fish Suggestion (মৎস্যপরামর্শ)



Fig : 4.1.5 Fish Suggestion (মৎস্যপরামর্শ)

The Button Fish suggestion as we discussed before that it is one of the most vital part of our project that it will take the value from the user as the value of the pH, Nitrogen, Oxygen, Temperature of the water after having this value the application will act as a doctor and let the farmer know what’s wrong with the water and the solution is also given with the condition. Here the operation of the button is quite easy bust vital it is working with simple condition with few tools as a text enter box where the farmers put the value and after giving the value it will show a suggestion with a text view.

Now 4 individual 4 several suggestions will give us 12 type of values from here. Such as the given value of the pH rate can be 3 kind of value. The given value could be good range value for fish surviving. Such as value 7 for pH is a perfect value for firming fish. It will display that the pH rate foe water is nice to survive. Again we have 3 several condition and 3 several values for the specific 4 item that is given here. Which will let farmers know about the condition of the water.

### 4.1.5.1 PH Related Suggestion

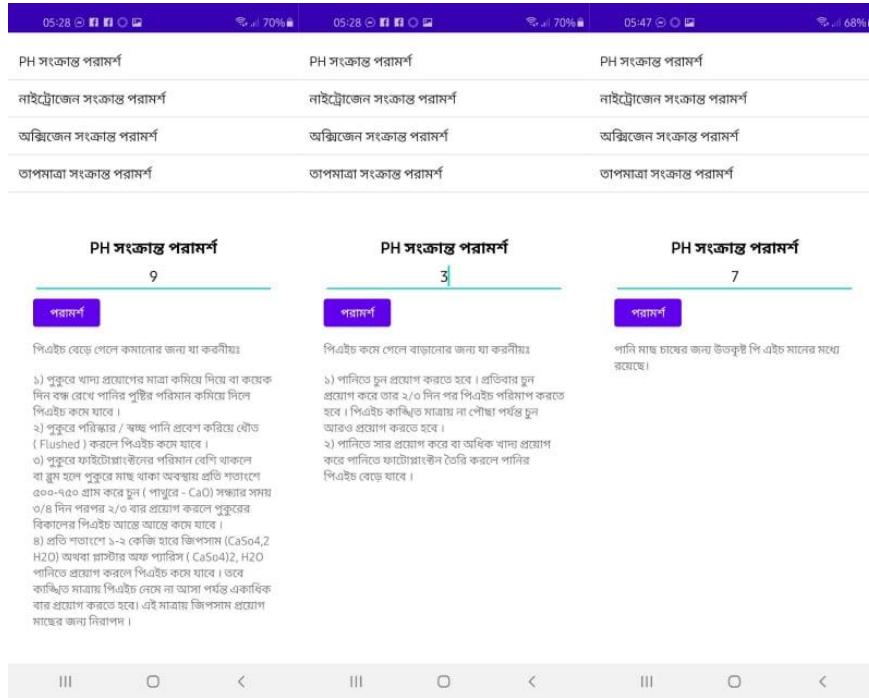


Fig: 4.1.5.1 PH Related Suggestion

### 4.1.5.2 Nitrogen Related Suggestion

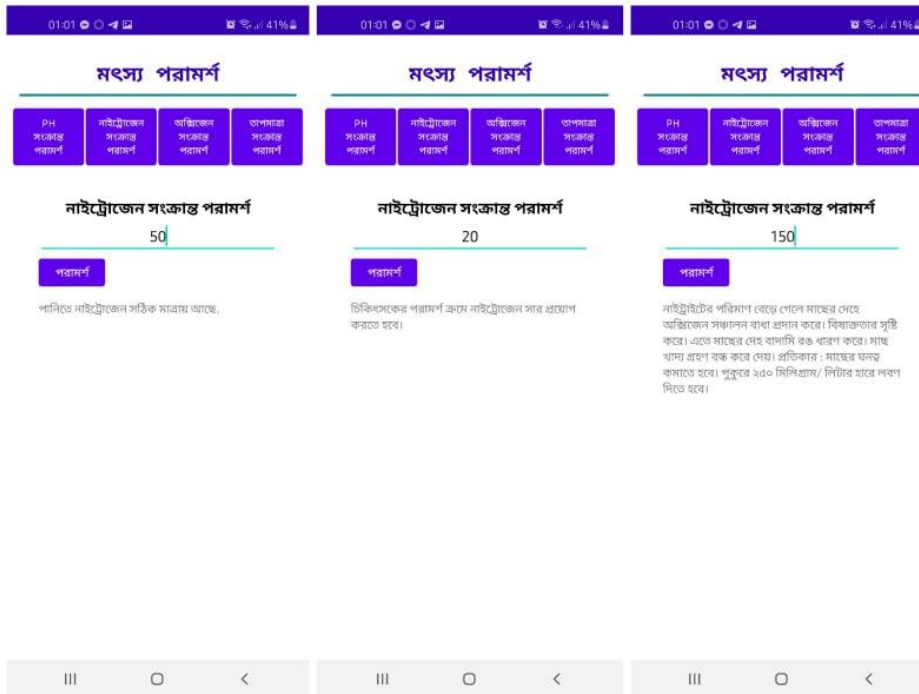


Fig: 4.1.5.2 Nitrogen Related Suggestion



### 4.1.5.3 Temperature Related Suggestion

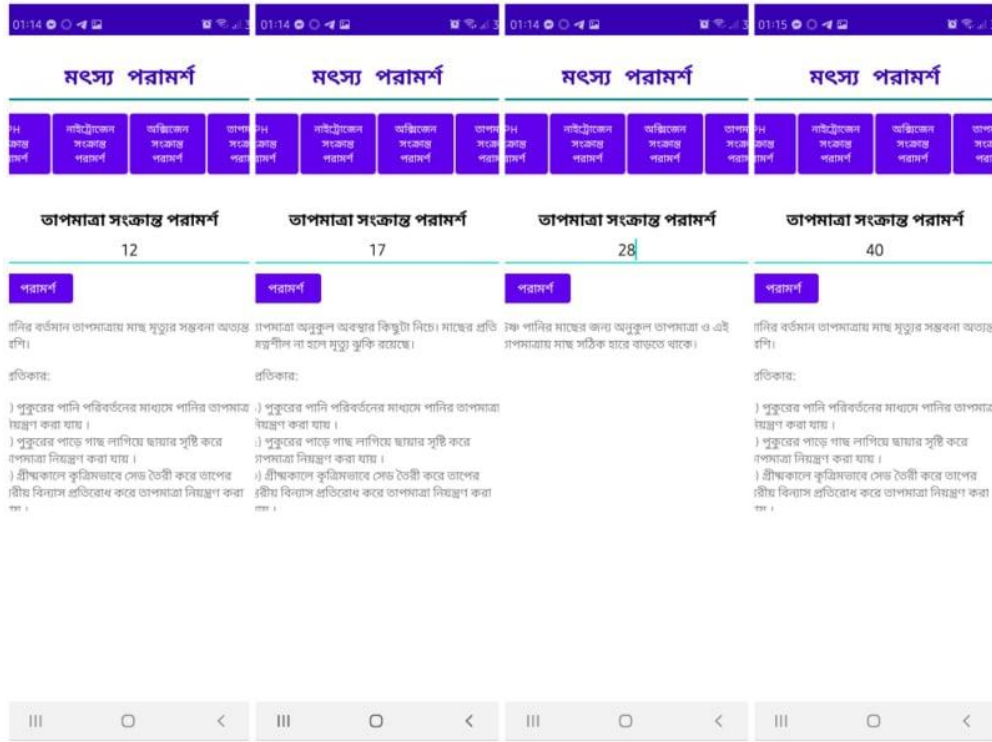


Fig : 4.1.5.3 Temperature Related Suggestion

### 4.1.5.4 Oxygen Related Suggestion

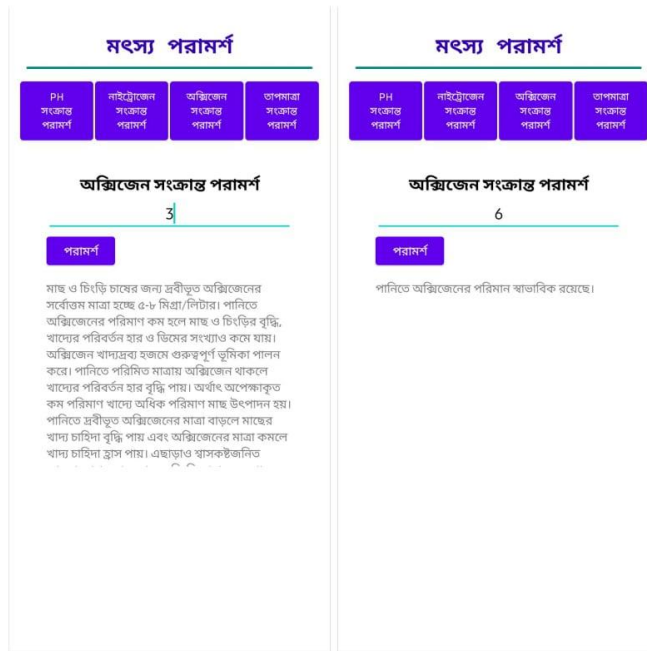


Fig : 4.1.5.4 Oxygen Related Suggestion

## 4.1.6 Help Line (সাহায্যকেন্দ্র)

Basically this button stands for the helpline number for contacting with the Mitsho Gobeshona Institute in Bangladesh. Having instant number is not quite easy in the necessary time. That's why the number fisheries of all the district is given in the button.

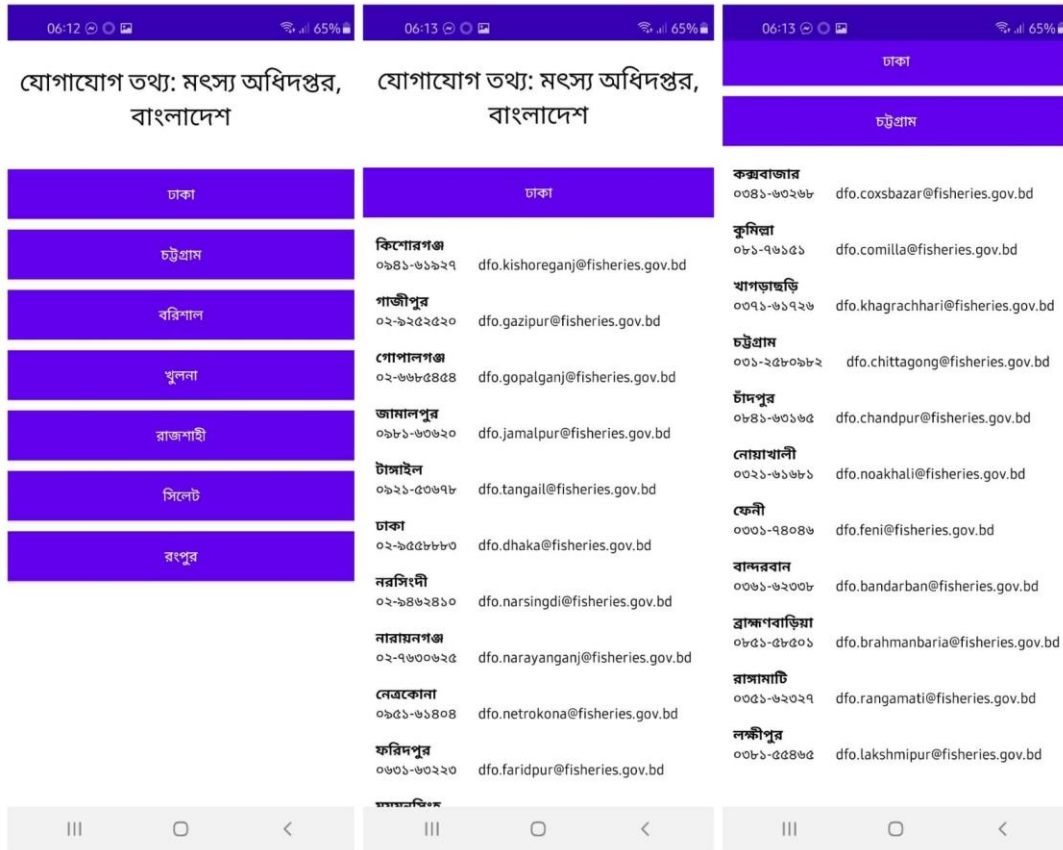


Fig : 4.1.6 Help Line (সাহায্যকেন্দ্র)

## 4.1.7 Copyright

Copyright button stands for the copyright information such as the version details the owner details and the build date and information is needed for the application is given here. So that we can also call it as it is the name plate of our application.

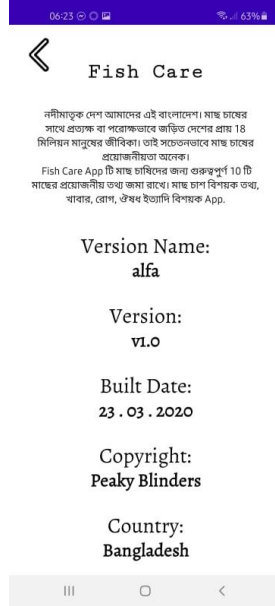
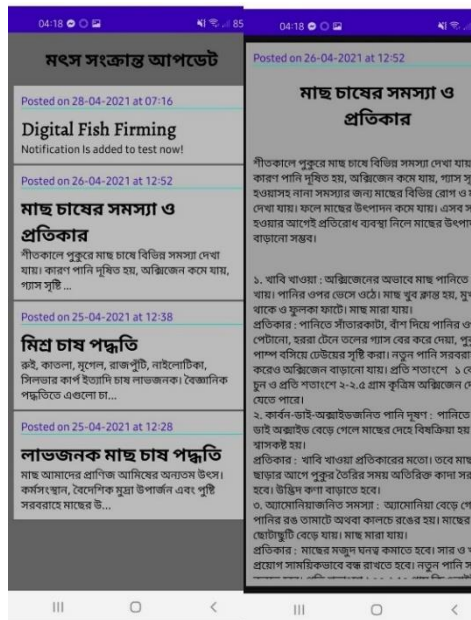


Fig : 4.1.7 Copyright

## 4.1.8 Fish Update (মৎস্যসংক্রান্ত আপডেট)

An Admin will update the new idea and data update about fish farming and the user will see the data update. Post will be given by admin and the user will only able to see it but yes the admin will able to update, delete and edit the post.



## 4.1.8 Fish Update (মৎস্যসংক্রান্ত আপডেট)

## 4.2 Admin Application Design

An extra application has been designed for admin panel where an admin can post any updated post or an admin can able to delete a posted post or admin can edit a post. To login as an admin the application will as the email and password in the beginning then after having the password from the admin it will show the admin operation page where admin can perform above mentioned activities.

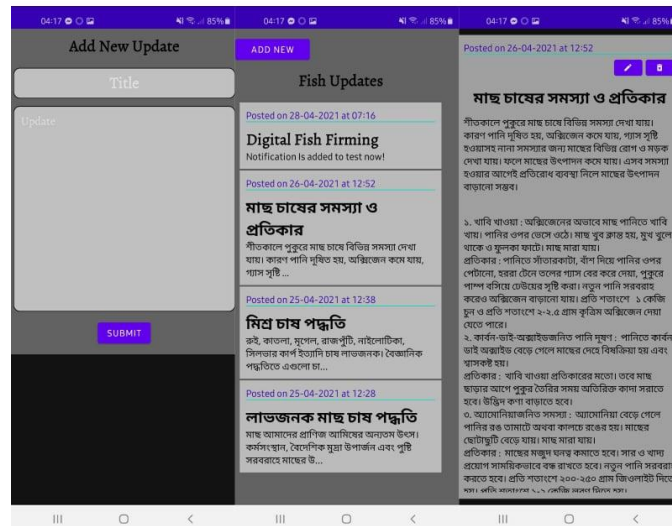
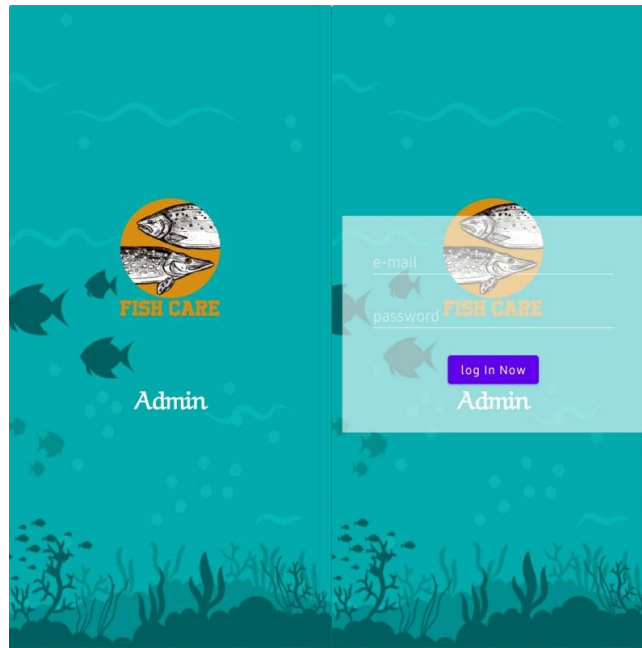
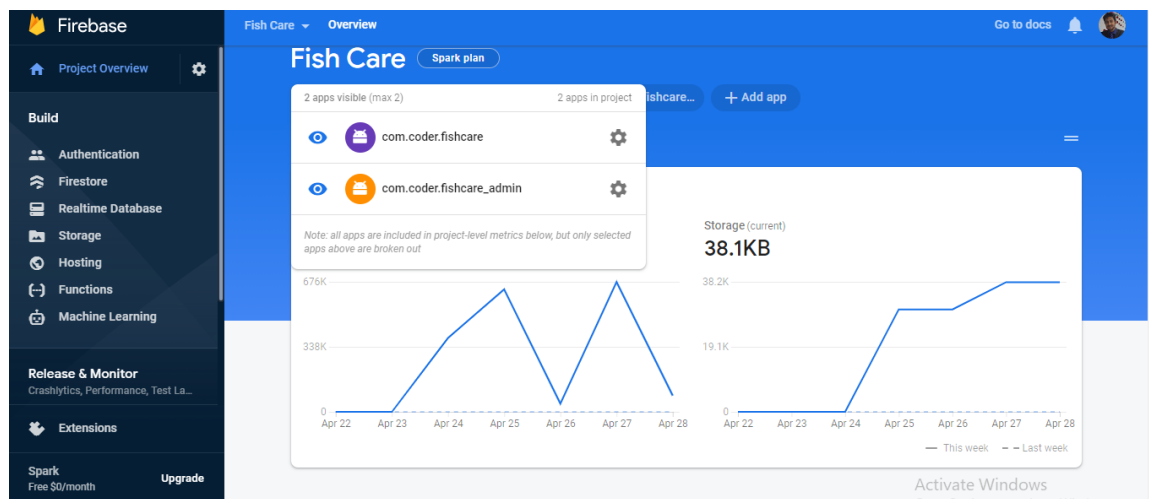
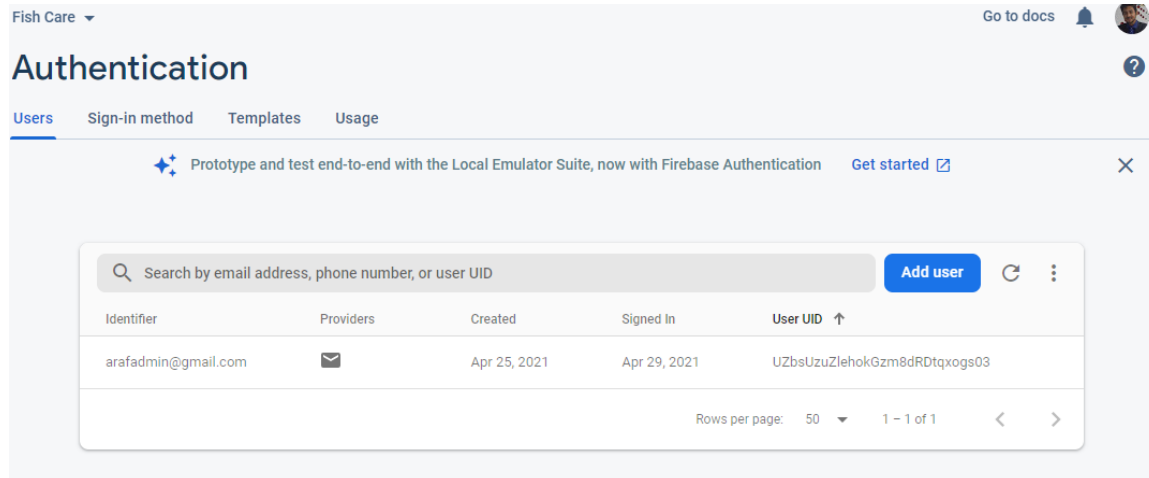


Fig : 4.2 Admin Application Design

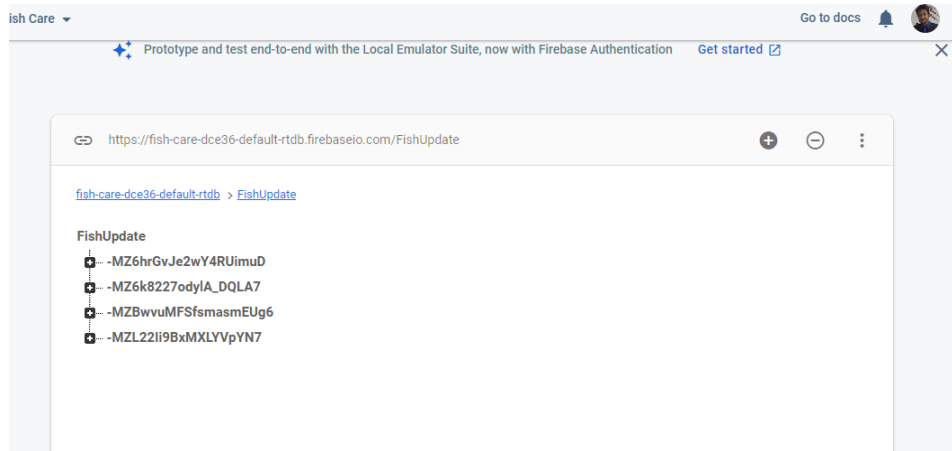
### 4.3 Back-End Design

Back end implementation had happened here is the authentication of the admin. So that an email and password is given here in the firebase to login authentication of the admin.

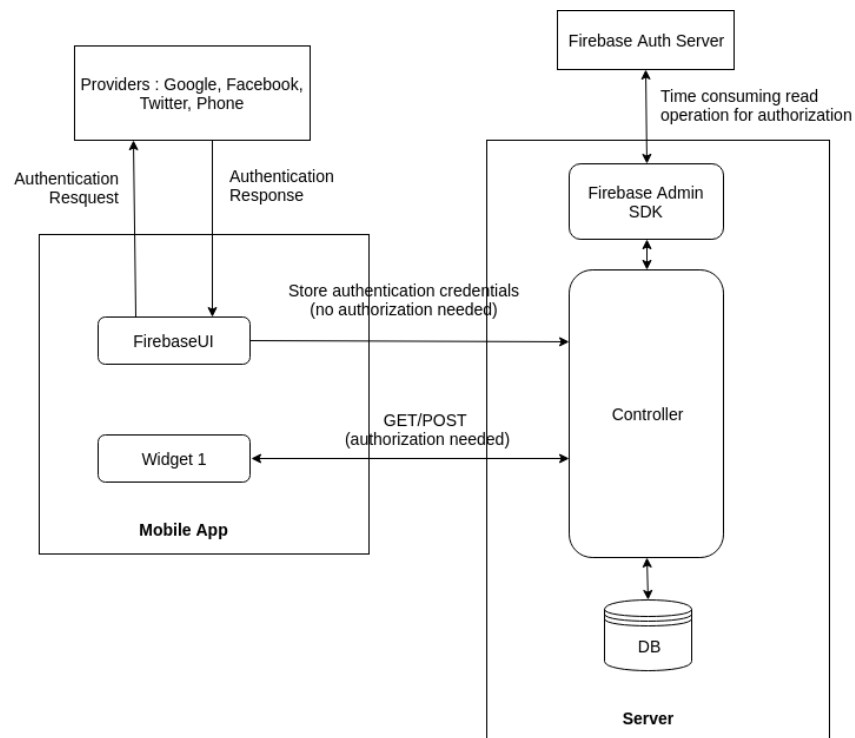


**Fig 4.3 : Back end authentication**

So here we see that the basic task of back end is authentication. After authentication the next task of back end is to create post. Through the admin panel data come to the fish update portion of our application and the back end part of our application working good in our application.



**Fig 4.3: Update working fine in database**



**Fig 4.3: Update working fine in database**

Provider will provide an email id or phone number to log in to the database and after that the operation of firebase will start. Where the admin can edit, update or delete any post. The operation UI is given here.

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

Database we have used here is the real time database. So that it is very specific that is we have implemented firebase base as our local database here. Data from the admin panel goes to the main application nicely. So that the database implementation is successfully implemented here.



**Fig 5.1 : Implementation of database**

## **5.2 Implementation of Interaction**

Interaction execution implies the simplicity with which a client can interface with the application. Have executed our application framework with a UI that responds rapidly. It will guarantee a superior client experience. We utilize some natural symbols, text see, button, spinner, and so forth Excellent and reasonable UI so clients can speak with the application without any problem.

## **5.3 Testing Implementation**

Android, there are three kinds of tests. Nearby unit testing, instrumentation testing and UI testing. A nearby unit test is performed on your neighborhood PC on the machine that has an Android studio introduced on it, and they are utilizing the JVM for short, they are utilizing Java on their PC, they are quick since you needn't bother with an emulator or anything with it. These are the kind of tests used to test code rationale (test dependent on crude Java code rationale). To broaden your test highlights incorporating test systems, like Mockito, to test Android API approaches your neighborhood unit tests.



## CHAPTER 6

### CONCLUSION AND FUTURE SCOPE

#### 6.1 Discussion and Conclusion

Before the conclusion one basic question is will my UI be able to give a solution about the problem of fish farming?

We believe that our project will be able to make a huge change in the fish farming sector. We have taken a real life problem to come out with a solution of that problem.

Well, a smart digital solution is always an optimal solution. Android based solutions have improved day by day but in the agricultural sector we haven't created enough technological opportunities at least from the perspective of Bangladesh.

Now helping farmers make us go to the water. As our goal was to help farmers with our application, we believe that our application will be able to fully fill our goal, though it may not be immediately but surely.

#### 6.2 Scope for Further Developments/Future Plan

As we know fish is one of our basic needs in our daily life, so that the need for fish will increase day by day without any doubt. In this purpose, we can make a huge development in this project. The future development and plan are given below:

1. This era is known as the era of IOT that means internet of things. We are planning to add machine learning with this project. First of all, we will implement some of the sensors and the values of the oxygen rate, pH rate, and temperature rate will be measured by those sensors and the sensors will send notifications to the mobile phone by internet.
2. A communication system with an admin will be created in this application in the form of a Helpline button so that farmers will be able to contact immediately with the experts so that the communication gap between experts and farmers will decrease.
3. In the future, when image processing will be working with the Android system, more than now, in that time we will develop a method or a new button which will work as a disease detector tool. The live image view of the fish will be taken by the camera and the camera will let us know that which disease has occurred in the fish.

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# PLAGIARISM REPORT

## Fish Care Final

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