IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 09, Issue 5 (May. 2019), ||S (IX) || PP 61-66

Auto Fish Monitoring System

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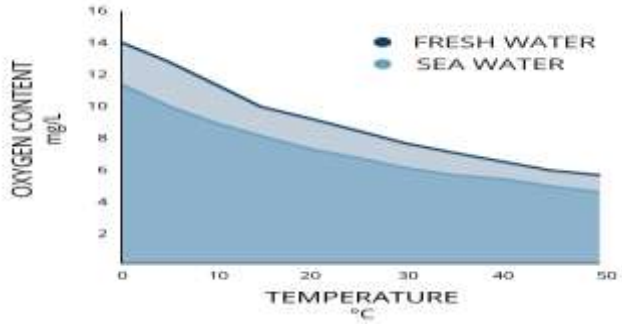
***Abstract**: Fish like many living organisms have specific tolerant range of various environmental parameters, thus fish farming of specific types of fish species requires certain conditions that have to be reached necessarily. Moreover, the people that work in the fish farming ponds have to be engaged in all day activities to maintain the living habitat of fish. Therefore, monitoring and taking actions to maintain the fish habitat for certain fish species inside the fishing ponds remotely is an important task. In this paper, we present an upgrade on a functional Internet of Things (IoT) system for monitoring fish farming ponds. The IoT system consists of various sensors that measure important factors of the water like temperature, pH value and water level and the data from these sensors can be accessed by an application through firebase.*
***Keywords**: Iot, aquaculture, fish farming , cloud compting.*

I. Introduction

Research in aquaculture is an input to increase stabilized production of aquatic animals like fishes. The main aim of the project is remote monitoring of the fish farming system by using the various sensors to reduce the risks related to the production of fishes. In this processes we use sensors like pH value, temperature and level sensors. By using these sensors all the work is automated and it will also be easy to monitor the fish farming parameters remotely from other location. Fish farming refers to farming variety of marine species such as shellfish, sport fish, bait fish, ornamental fish, crustaceans, mollusks, algae, sea vegetables, and fish eggs to breed, rear and harvest in different water environments such as ponds, rivers, lakes, and ocean. Fish are cold-blooded animals, regulating their body temperature directly by the water environment. Changes in water temperature affect the amount of dissolved oxygen in the water and fish oxygen consumption. Although the fish can withstand a broad water temperature range, any sudden, extreme changes in water temperature will have a considerable impact on fish physiology. A chilling injury will cause the fish to rush into, paralysis with a loss of balance, leading to death. The reason may be the respiratory center, or osmotic regulation is affected at high temperatures. As the water temperature increases the fish suffer respiratory arrest. Fish World magazine found that the amount of dissolved oxygen in water increases or decreases with the seasons. When the water temperature rises, fish metabolic rate will be increased and results in less dissolved oxygen in the water. Low water temperature decreases fish metabolic rate and increases amount of dissolved oxygen in the water. If the amount of dissolved oxygen in water is reduced to below a certain limit fish growth will be hindered. When the amount of dissolved oxygen becomes lower than the fish survival conditions the fish will die. In general fish farming the acidity and alkaline of the water should be maintained between 6 to 8. Too acidic or alkaline will cause adverse effects, acid erosion of the gill tissue, tissue coagulation necrosis, increased mucus secretion, abdominal congestion and inflammation. If the PH value is less than 4.5, the fish will die. Graph below shows how oxygen content in water decreases the temprature increases.



II. Literature Survey

(1)Remote Temperature Monitoring Using LM35 sensor and Intimate Android user via C2DM Service by Prof. (Dr.) Yusuf Mulge:

This paper presents an embedded wireless sensor network prototype for remote room temperature monitoring. This network will be used for management of fire rescue operations. It will give the Android registered user freedom to continuously monitor the remote room temperature and in this way it provides better fire controlling technique. The proposed system provides an android user interface for registered user to access the current temperature and a flash/beep message in case of fire. LM35 sensor sense the remote room temperature and temperature status is transmitted to the smart phone via GPRS. Remote room temperature data transfer between the smart phone and application server that is connected to temperature sensor via USB cable is done using Google's C2DM service. The application server which analyzes the temperature data, then inform a registered user for taking proper action in case of fire. This work aims at monitoring of remote room temperature. Thus, provides opportunity to quickly respond to fire emergencies.
https://ijcsmc.com/docs/papers/June2013/V2I6201313.pdf

(2) Cloud Computing for Internet of Things & Sensing Based Applications by Prahlada Rao B. B, PayalSaluja, Neetu Sharma, Ankit Mittal, Shivay Veer Sharma:

Internet of Things (IoT) is a concept that envisions all objects around us as part of internet. IoT coverage is very wide and include variety of objects like smart phones, tablets, digital cameras, sensors, etc.

Cloud computing is a model for on-demand access to a shared pool of resources (e.g. compute, networks, servers, storage, applications, services, and software).Cloud based platforms help to connect to the things around us so that we can access anything at any time and any place in a userfriendly manner.

In this paper, it describes how Internet of Things and Cloud computing can work together can address the Big Data issues. It also illustrates about Sensing as a service on cloud using few applications like Augmented Reality, Agriculture and Environment monitoring.This paper proposes that the Cloud Computing model is a good fit for IOT applications with thedynamic computational requirements of environmental monitoring and modeling.

https://www.researchgate.net/publication/261422509_Cloud_computing_for_Internet_of_Things_sensing_based_applications

(3)Water Monitoring IOT System for Fish Farming Pondsby Prof. D-r. Eng. Naumoski A.:

Fish like many living organisms have specific tolerant range of various environmental parameters, thus fish farming of specific types of fish species requires certain conditions that have to be reached. Moreover, the people that work in the fish farming ponds have to be engaged in all day activities to maintain the living fish habitat. Therefore, monitoring and taking actions to maintain the habitat's sustainable environment for certain fish species inside of fishing ponds over distributed machine to machine communication, which will shorten the time needed for some basic actions, is the main motivation for this paper. In this paper they present an upgrade on a functional Internet of Things (IoT) system for monitoring fish farming ponds. The IoT system consists of various sensors that measure important factors of the water quality like temperature, light intensity or water level, as well as small board computer that processes the data and sends sound and visual notifications to the fish farming manager.

This system lacks the ability to process the data to the end-user via web or mobile platform due to remote distance of the fish farming ponds and their location dependencies.

https://stumejournals.com/journals/i4/2018/2/77/pdf

(4)IoT for Aquaculture 4.0 byCharlotte Dupont, Philippe Cousin, Samuel Dupont:

While aquaculture and IoT have exponentially grown in the world in the last years, the combination of both domains still remains at its early stage. Although water monitoring is at the center of the aquaculture activity, its complexity can often push fish farmers to neglect it. IoT for aquaculture needs to be smart, affordable, easy to deploy, reliable and highly efficient. In this paper they describe the results from European research projects that build the foundation of a new aquaculture 4.0. This technical paper majorly focuses on the following factors:

- The world-wide development of aquaculture
- The importance of the water quality monitoring
- The need of IoT for a new aquaculture
- The cost effectiveness on IOT based water monitoring, etc.

http://www.eglobalmark.com/iot-aquaculture-4-0/

(5)IOT based Automation of Fish Farming byS. Usha Kiruthika,Dr.S. Kanaga Suba Raja,R. Jaichandran:

The proposed work supports remote monitoring of the fish farming system based on Internet of Things (IOT) for real-time monitor and control of a fish farming system.Objective is to provide an automatic fish farming monitoring system thereby saving time, money & power of the farmer. IOT technologies have revolutionized farm production in the country. In the fish farming processthey have used various sensors like pH value, temperature and level sensors. By using these sensors all the work is automated and it will also be easy to monitor the fish farming remotely from other location.

This article discussed physical measures such as temperature, level, PH value using the A / D signal processing, via Wi-Fi wireless transfer to the terminal server. The data messages are analytically processed, sent to the server database and displayed on a computer terminal.
http://jardcs.org/papers/v9/3034.pdf

III. Problem Statement

Fish farming involves raising fish commercially in tanks or enclosures such as fish ponds, usually for food. The main aim of the project is remote monitoring of fish farming system by using the various sensors through an application to reduce the various risks. In this process we will use sensors like pH value, temperature and water level sensors. By using these sensors all the work is automated and it will also be easy to monitor the fish farming remotely from other location

IV. Flow Diagram

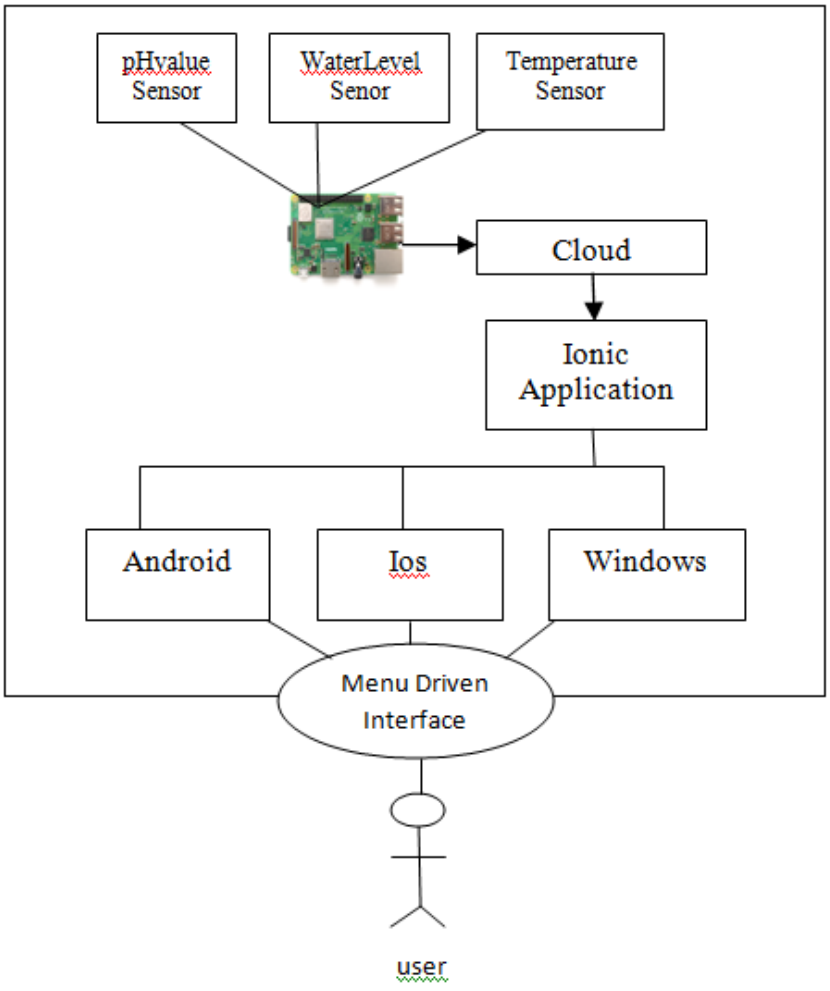
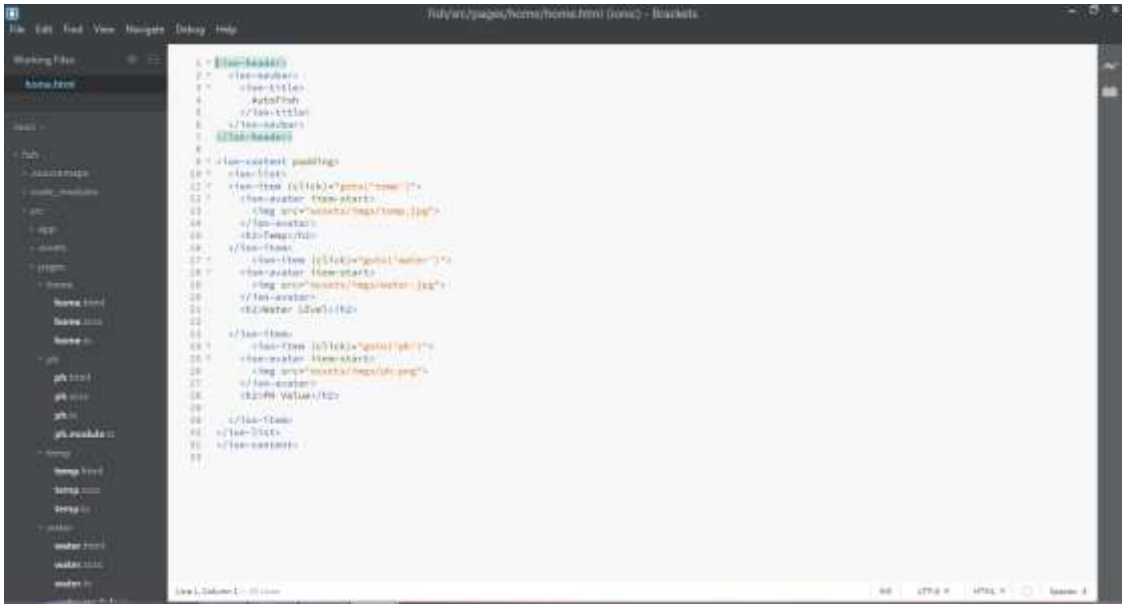


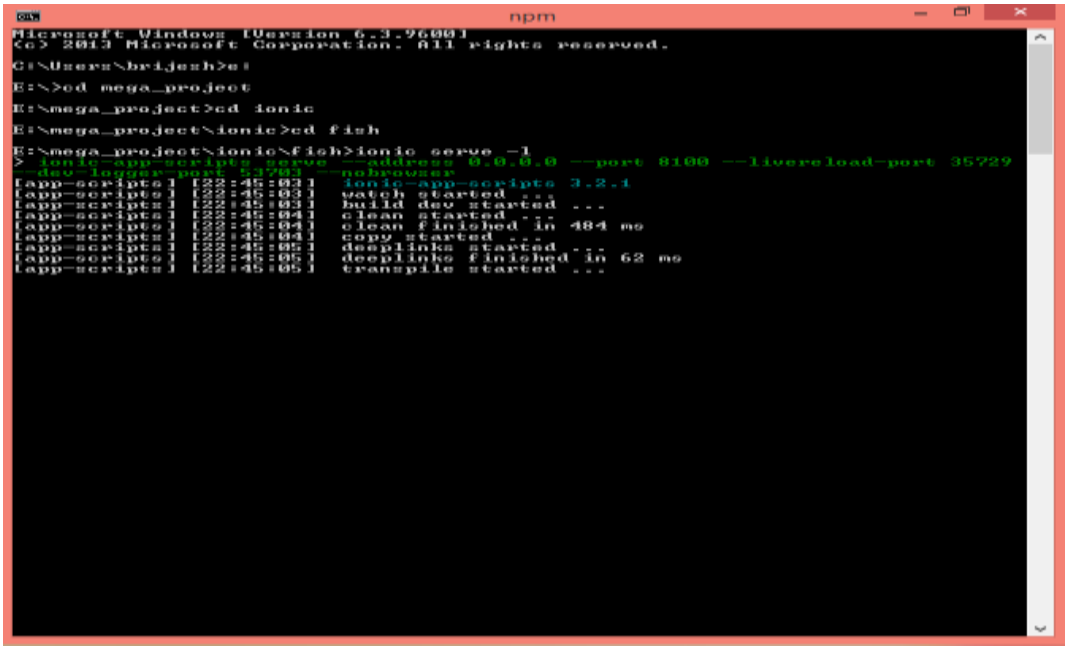
Figure depicts the menu driven interface used by the user to interact with the autofish monitoring system. Since we are using the ionic tool for creation of the applications we can use the application on various platforms such as android, ios and windows. This application provides a menu a driven interface as it provides us a menu to view three parameters of water in fish ponds i.e. temperature, water level, pH value. So, we can view the data from the respective sensors connected to the raspberry pi coming through the cloud in the autofish application as seen in the above figure above.

V. Implementation

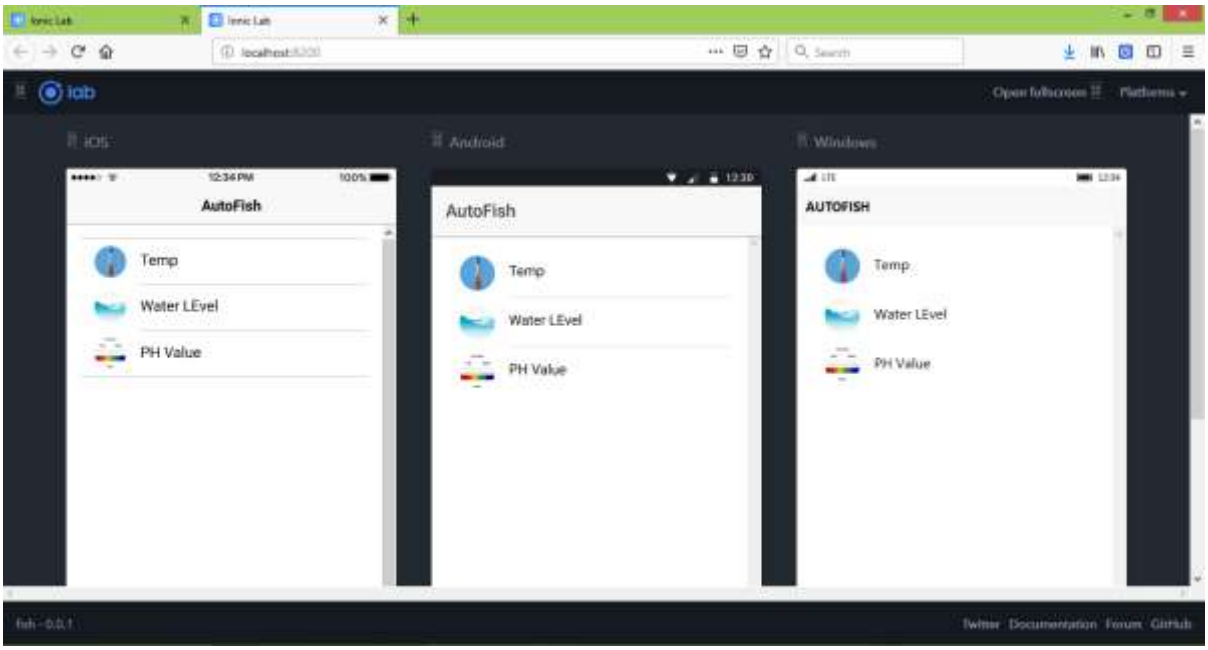
The domain of this project is IOT . To access the values provided by the sensors, we access it using ionic application. The coding for ionic application is done using Brackets Editor as shown below:



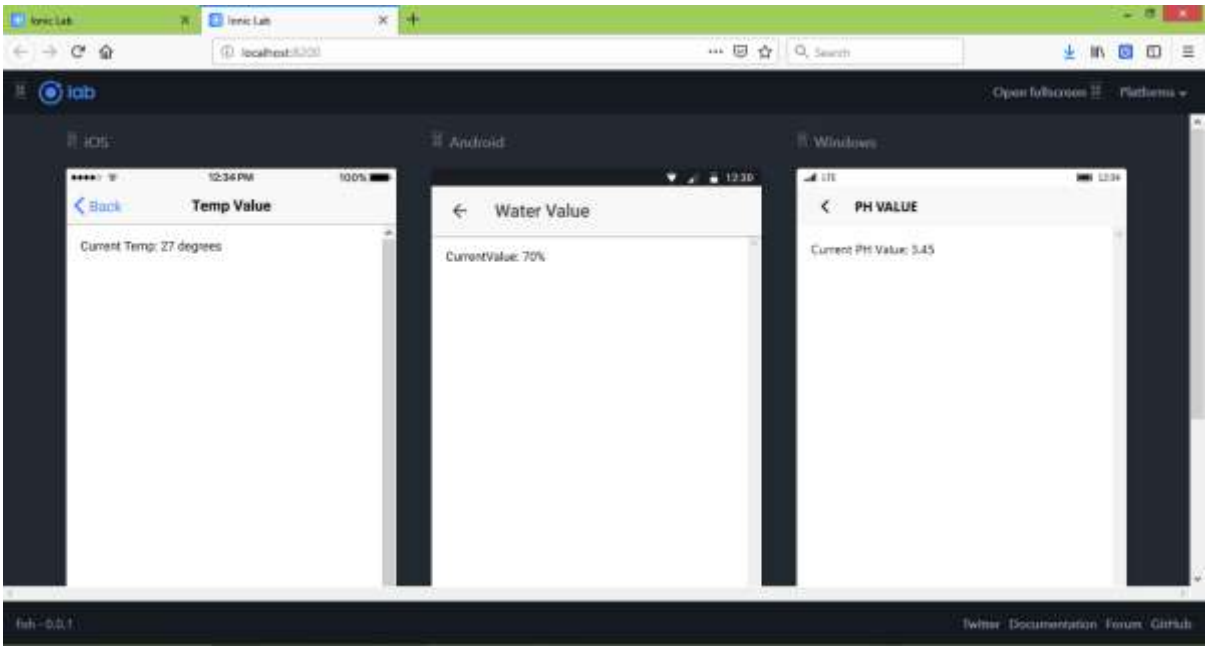
We have built up the application using various modules using ionic framework which incorporates HTML, SCSS, TYPE SCRIPT.
We can open this application by applying following commands on the command prompt as shown below:



Ionic lets us achieve hybrid app development so, this application has been implemented by us for IOS, ANDROID, WINDOWS.



So, now we can click on the respective icon to view the required values as shown below:



So this is how the implementation has been carried out.

VI. Result Analysis And Discussion

Commercial aquaculture development includes a considerable number of commercial, biological, engineering, precision measurement and calculation areas. Technological development can produce more accurate control and higher economic efficiency.

Our project has resulted into an autofish monitoring system where we can remotely access temperature, pHvalue and water level of water in fish ponds using respective sensors and data connectivity.

So, we have analyzed that we have created an ionic application interface and started the raspberry pi by installing the raspbian operating system in it.

VII. Conclusion And Future Scope

Commercial aquaculture development includes a considerable number of commercial, biological, engineering, precision measurement and calculation areas. Technological development can produce more accurate control and higher economic efficiency.

We have proposed an approach of autofish monitoring system where our main aim is to remotely access temperature, pH value and water level of water in fish ponds.

To extend this project by adding cameras in water tanks.

Also provide the same idea for pearl farming.

To convey same idea in the domain of agriculture to get the pH value of soil in farming**.**

References

[1]. Arshak, K., Gill, E., Arshak, A. And Korostynska, O. Investigation of tin oxides as sensing layers in conductimetricinterdigitated pH sensors.
[2]. Dyck, A.J. and Sumaila, U.R. Economic impact of ocean fish populations in the global fishery.
[3]. Graham, M. And Haarstad, H. 4 Transparency and Development: Ethical Consumption through Web 2.0 and the Internet of Things.
[4]. https://ionicframework.com
[5]. https://developer.android.com
[6]. https://pimylifeup.com