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# Use of internet of things (IOT) on fish feeding tools with nodemcu

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**Abstract:** In everyday life whether in the city or in the countryside, there are lots of fish keepers in both large, medium sized ponds or small ones. Raising fish is an activity
people who are very popular from the past until now, because ease of maintenance and care that makes most people want to cultivate fish. Fish kept in considered pond must give time to feed so that the fish requires a regular and continuous feeding schedule. ESP8266 NodeMCU is an integrated chip component that designed for today's connected world. these chips offers a complete, unified Wi-Fi networking solution that can used as an application provider or to sell all functions Wi-Fi networking to other application processors. One of its uses namely as an Automatic Fish Feeder Using ESP8266 Based on the Internet of Things (IOT). By using the components of the tool above as well as some supporting software When the tool runs, the fish feeder can automatically work in accordance with the schedule options that have been previously arranged, and capable displays data to web pages in the form of notifications when feed has been given and when the reservoir is empty or exhausted.
**Keywords**: Feeding, ESP8266 NodeMCU

## 1. Introduction

Snakehead fish is a type of freshwater fish that has delicious meat and is in great demand by consumers. In addition, snakehead fish also contains healthy nutrients such as protein, omega-3 and vitamins. The Indonesian government is also increasingly encouraging the development of snakehead fish farming because of its considerable economic potential. Several regions in Indonesia which are famous for snakehead fish farming are Central Java, West Java, East Java, West Sumatra and North Sumatra [1]

Commercial feed in the form of pellets with a percentage of 6% -7% can be used as the main feed to replace trash fish with a frequency of feeding done 2 times a day, namely in the morning and evening, and of course there are many other benchmarks depending on the situation and condition of the fish. And also if it is too excessive in feeding it can result in water quality

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pollution which comes from snakehead fish excrement or it can be said to be the result of the process of disposing of feed (waste) from snakehead fish.

As technology advances, the advantage of internet connectivity is the ability to access electronic devices such as Internet of Things (IoT) based fish feeders which can be accessed online through websites or programs provided by service providers. The remote control system makes it easy to remotely control the Internet of Things (IoT) based fish feeder. IoT (Internet of Things) is a concept that aims to continue to expand the benefits of internet connections. By using an internet connection connected to the NodeMCU ESP8266. In this system, the user can send control commands via blynk, which will then be received by device I and executed according to the received command. Users can connect this widget to their IoT hardware via an internet connection using Wi-Fi, Ethernet or Bluetooth protocols [2]

## 2. Methods

### 2.1.Internet of Thing

The Internet of Thing is a concept where certain objects have ability to transmit data over a network and without a network. IoT began to develop rapidly after the availability of wireless technology, microelectromechanical systems (MEMS), and of course the internet. The Internet of Thing is also often identified using RFID as a communication method. The history of the development of the Internet of Thing began in 1989, then 1990 and so on. A scientist named John Romkey developed a device that was no less sophisticated than a toaster that could be turned on or off via the internet. In 1994 WearCam was created by Steve Mann. Then in 1997 Paul Saffon briefly explained his invention of sensor technology and its future. Then in 1999 Kevin Ashton created a concept for the Internet of Thing. In 1999, machines based on Radio Frequency Identification (RFDI) were discovered around the world. This is the invention that is the beginning of the popularity of the IoT concept. Then in 2000, the famous brand LG announced its plans and released IoT technology, namely smart cabinets. Then in 2003, the already mentioned FRID began to find an important place in the era of technological development in America through Savi. IoT came back in 2005 when famous media such as The Guardian and Boston Globe began to quote a lot of scientific articles and the development process of IoT. By 2008 several companies had agreed to launch IPSO to market the use of IP on the target network taking over the IoT itself [3].

### 2.2.ESP8266

The ESP8266 microcontroller is manufactured by a company called Espressif Systems in Shanghai, China. One of the advantages of ESP32 is that it already has WiFi and Bluetooth, so it is very easy to learn how to create IoT systems that require wireless connections. This module can be used for other applications such as system control, monitoring and other applications. ESP32 has a deep sleep function that saves power by turning off the module when not in use [4].

### 2.3.Servos MG996R

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The MG996R servo is a type of servo motor, which is a device designed to control or monitor mechanical movements with high precision. The structure of the servo motor consists of a DC motor, a potentiometer and a controller. The MG996R servo can move its axis through a certain angle, usually from 0 to 180 degrees. Some of the general specifications of the MG996R servo include maximum torque, rotation speed, operating voltage and operating current. This servo is often used at 4.8V to 6V and has a maximum torque of around 10-12kg/cm [5].

### 2.4.LCD 16x2 + I2C

LCD is a display medium that produces good character displays, and lots of them. The 16x2 LCD screen can display 32 characters, 16 characters on the top line and 16 characters on the bottom line. I2C LCD is an LCD material which is serially controlled synchronously by the I2C/IIC (Inter Integrated Circuit) or TWI (Two Wire Interface) protocol. Of course, LCD material is transferred in parallel, both the information and control paths[6].

### 2.5.Buzzers

An alarm is an electronic component that can produce sound vibrations in the form of sound waves. The detector produces vibrations and sound when a certain electrical voltage is applied to it, depending on the shape and size of the detector [5].

### 2.6. Blynk (Smartphone)

Blynk is an application for iOS and Android OS to control Arduino, NodeMCU, Raspberry Pi and other applications via the Internet. This application can be used to control hardware, display sensor data, data storage, visualization and other applications.

### 2.7. Snakehead Fish Feed

Snakehead fish can eat 2-3 times a day in the morning, afternoon and evening. However, the frequency of feeding can be adjusted according to the size of the fish and the water temperature. The amount of feed must be adjusted to the size of the fish. Overfeeding can cause water pollution, while underfeeding can inhibit fish growth. The Snakehead is a predatory fish that feeds on small fish, shrimp and insects in the wild. Therefore, the feed must contain a lot of protein. Snakehead fish food is usually in the form of pellet food with a protein content of around 40-50% [7].

### 2.8.Mobile Communications

According to the book "Wireless Communication" Mobile phones can be defined as electronic devices used for two-way radio communication via a cellular network of base stations called base stations. Cell phones differ from landline phones, which only operate within a limited range via a base station connected to a landline network, much like a home or office telephone,

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offering telephone service. In addition to telephones, modern cell phones support many additional services and accessories, such as SMS, e-mail, Internet, games, wireless Bluetooth and infrared short-range communications, cameras, radios, MP3 players and GPS. Low-end phones are often referred to as feature phones, while premium phones with advanced processing capabilities are referred to as smartphones[8]

## 3. Results and Discussion

The implementation method in this study is generally divided into 5 stages as shown in the following diagram:

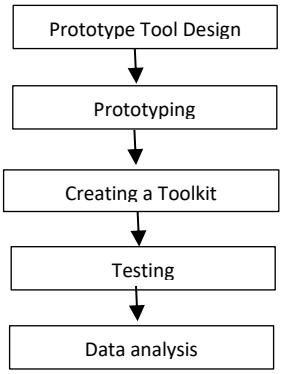


Fig 1: Research Workflow

### 3.1. Circuit Block Diagram

The block diagram of the designed system, as shown in Figure 2

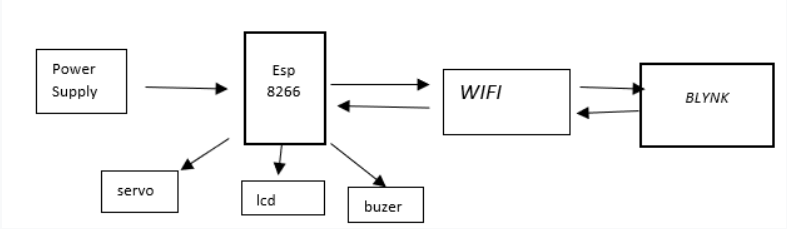


Fig 2: Circuit Block Diagram

The description of the block diagram above is as follows:

1. The power supply sends power to the Nodemcu Esp8266 so that all circuits can run.

2. Nodemcu Esp8266 sends data via Wifi then sends data to the Blynk Smartphone Application.

3. Blynk returns data via Wifi to Esp8266.

4. Esp8266 drives the Servo then sounds the Buzzer, and displays a message on the I2C LCD

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### 3.2 Display of the BLYNK Application on a Smartphone

Displays Feeder scheduling controls using the BLYNK application which can be downloaded via Google Playstore or Appstore. The display of the blynk application on a smartphone of the designed system, as shown in Figure 3.

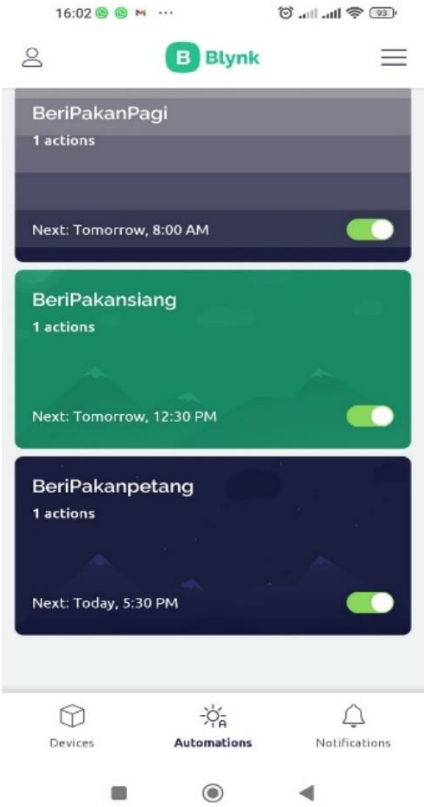


Fig 3: Display of the BLYNK Application on a Smartphone

### 3.3 Overall Tool Set

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This suite includes the components necessary to design tools to make the data engine work the way it should. In this circuit, bradboard, 9 volt battery, and stepdown are added as a power supply.

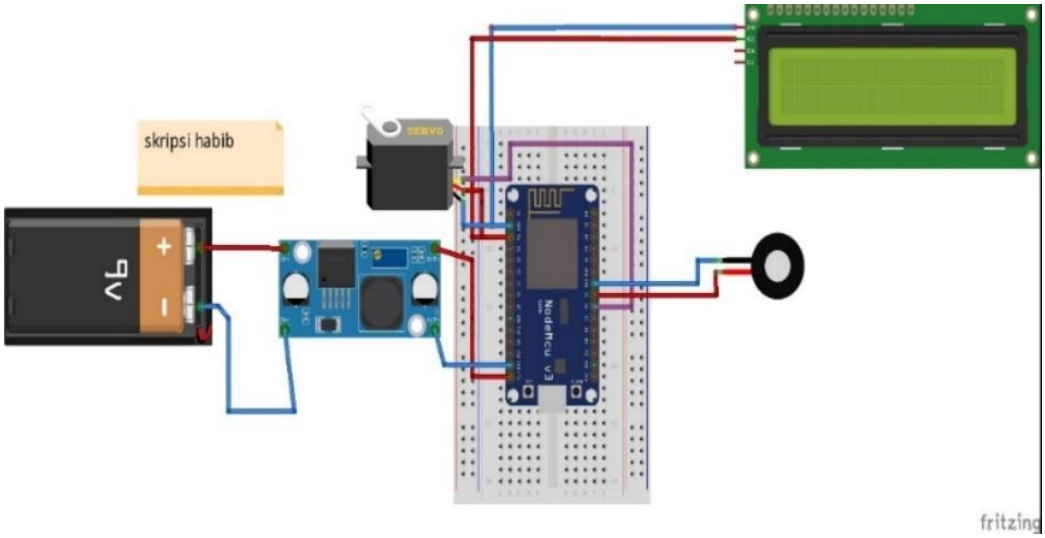


Fig 5: Overall Tool Set

## 4. Implementastion and Testing

The hardware design consists of mechanical hardware in the form of a prototype that more or less represents the implementation in the field and electronic hardware. The mechanical hardware design consists of panels made of acrylic boards to place electronic components.

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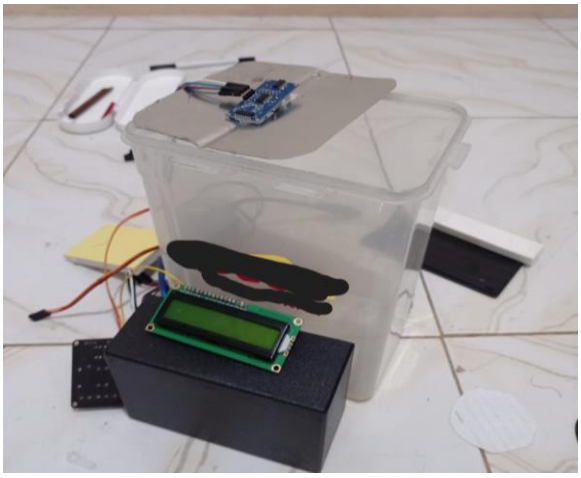

Fig 6: Hardware Set

## 5. Conclusion

After carrying out various tests on the design of the Giving Tool Internet of Things Based Automatic Fish Feed, both devices hardware and software, some conclusions can be drawn as follows following. This report has resulted in a Fish Feeder Kit Internet of Things (IoT) Based Automation in the aquarium. And where is the center The control tool is NodeMCU ESP8266. This tool has three methods of feeding fish, viz automatically or that has been made a schedule, giving instructions or sending messages through the blynk application to the microcontroller and buttons manually, the way we press the button then the feed will come out by itself. Internet Of Things (IOT) Based Automatic Fish Feeding Tool, In the process of monitoring or monitoring, we can see from the blynk application, so we don't have to worry anymore when we are busy inside feeding.

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