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Scheduling Uses the Blynk 2.0 Automations Feature for Effective Ornamental Fish Feeding

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ABSTRACT

Maintenance of ornamental fish can not be separated from the importance of regular feeding. Feeding which is still done manually will of course confiscate time and requires patience. However, the problem is when traveling that it doesn't Allows manual feeding. Matter this requires a system or tool that can provide fish feed automatically based on a schedule which is determined. One that can be used is with create Internet of Things (IoT)-based devices. There have been many developments in IoT-based devices gave birth to a variety of features that can be utilized in create automation tools in everyday life. Wrong one of which is a feature on the Blynk 2.0 application. on this application there is one feature that can be utilized in the process scheduling to perform one particular activity that very easy for users without having to be difficult to make a program commonly known as Automation feature. This feature will work continuously periodically according to a predetermined schedule. On research this will take advantage of these features in the manufacture of tools automatic fish feeding automation. scheduling feeding fish will utilize automation features at the same time can be monitored when the last feed was given. This study utilizes the NodeMCU ESP8266 as main controller and servo motor as driving tool feeder. The tool will be connected to the Blynk application via Wi-Fi network.

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1. INTRODUCTION

Maintenance of ornamental fish can not be separated from the importance regular feeding. It is certainly very affect the development process of ornamental fish the. Feeding is still being done regularly manual course will be time-consuming and require patience. However, the problem is when travel that is not possible to deliver feed manually. This requires a system or a tool that can provide fish feed automatically based on a set schedule. One that can used is to create a device based Internet of Things (IoT). IoT is widely used to create devices or tools that can make work easier man. Various IoT platforms are also currently increasing multiply. One of them is the Blynk application. Blynk is an Android-based IoT cloud platform iOS which can be used to control the device Arduino[1]. The development of the Blynk application is currently on version 2.0. In this latest version there is an interesting feature namely automations that can be used to perform scheduling activity. In this research will create a tool for feeding fish automatically based on time (hours) which is set via the Blynk application. On the Blynk app scheduling will be made for the provision of fish feed on an ongoing basis automatic. Schedules are made according to needs users added to the automation feature found in the Blynk application. Use of this feature will This is done through integration of the website version of Blynk and Blynk mobile version (Android or iOS) This automatic fish feeding device will utilizes the NodeMCU ESP8266 and its servo motor strung together with containers or feed containers made of plastic material.

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2. LITERATURE REVIEW

a. Previous Research

There have been several studies conducted on provision of fish feed, but have not implemented the system scheduling as discussed in this study. On research[2] discusses the feeding of fish through scheduling using the Real Time Clock module (RTC). Fish feeding is done on an hourly basis determined to be compared with the results reading from the RTC module. If the hour is right, then the feed is given. This research does not apply IoT. The tool cannot be monitored remotely. Apart from scheduling feeding, this study also checked temperature and water level. Research[3] also applies scheduling using the RTC module. Apart from using the RTC, on This study also uses ultrasonic sensors to check the availability of feed and servo motors for opens and closes the feed supply valve. Together with research[2], in this study also did not apply IoT so that feeding cannot be monitored from a distance Far. Still the same as previous research, on research[4] also used the RTC module to set up feeding schedule. In addition, this research also utilize a load cell to weigh the weight of the feed poured into the test pond. aside from that utilizing 2 (two) servo motors to open and feed valve. Research[5] also discusses feeding automatic fish by adjusting the amount of feed given the growth rate of fish. In this research also equipped with a sensor to read whether the feed is up or not and can give an alarm warning. In research[6] an automatic fish feeding system made not using IoT. Timing done manually in the program code. Besides feeding fish automatically, this research also check the pH of the water using a pH sensor as well measure the level of water clarity using the TDS sensor. Research [1],[7] have used the IoT concept in manufacture of automatic fish feeder. One make use of firebase realtime database and one using Blink. However, it is used to control remotely, not used for scheduling. Scheduling is done using the RTC.

b. NodeMCU ESP8266

The main controller used in this study is the NodeMCU ESP8266 microcontroller[8]. This module already integrated with IoT-based WiFi modules and has good level of accuracy [7]. The NodeMCU ESP8266 version used in research, namely version 3[9]. The following is the model NodeMCU ESP8266 which can be observed in figure 1.

Figure 1. NodeMCU ESP8266

c. Blynk 2.0

Blynk is a platform for mobile OS applications (iOS and Android) which are commonly used to control Arduino, Raspberry Pi, ESP8266, Wemos D1 modules and similar modules over the internet[10]. Blynk has gone through several versions. In this study, the version used is version 2.0 which has automation features[11].

d. Motor Servo

Servo motor is a motor that has a closed feedback system where the position of the motor will be informed back to the control circuit inside the servo motor[12]. In this study, this servo motor was used as a drive for fish feed containers. The type of servo motor used is the micro servo SG90[13]. The servo model used can be seen in Figure 2 below[14].

Figure 2. Micro Servo SG90

3. RESEARCH METHODS

In completing the research carried out through several stages, including:

a. Tool Design

Before making the device, it first starts with designing the model of the tool to be made. The following is a sketch of the tool design made which can be observed in Figure 3 below[15].

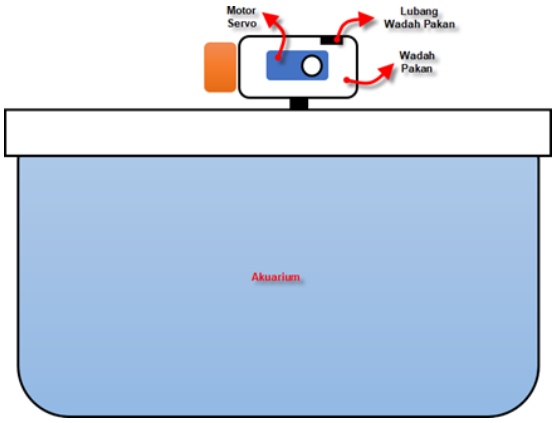


Figure 3. Tool Design

At the top there is a feed container which is directly connected to the servo motor and also connected to the NodeMCU ESP8266[16]. The feed container has a hole to put the fish feed in. The servo motor will rotate 90 degrees to spill fish feed at the time specified via the Blynk application[17]. After providing feed, the tool will report to the Blynk application that feed has been given on that schedule[18].

b. Network Schematic

The circuit scheme used is relatively simple, because it only consists of 2 components, namely the NodeMCU ESP8266 and a servo motor[19]. The circuit schematic can be seen in Figure 4 below[20].

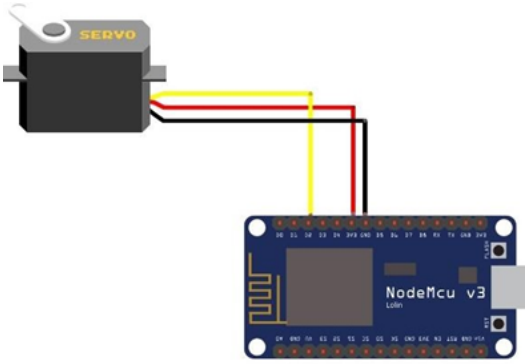


Figure 4. Network Schematic

c. Flowchart

The workings of the tools made in this study are illustrated through a program flowchart that shows the sequence of program processes[21]. The flowchart in question can be observed in Figure 5 below[22].

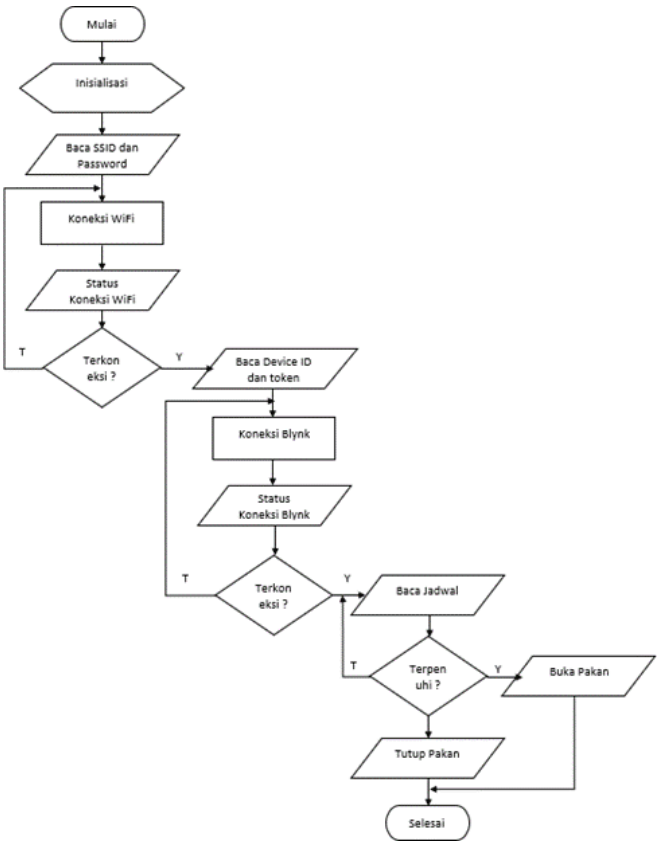


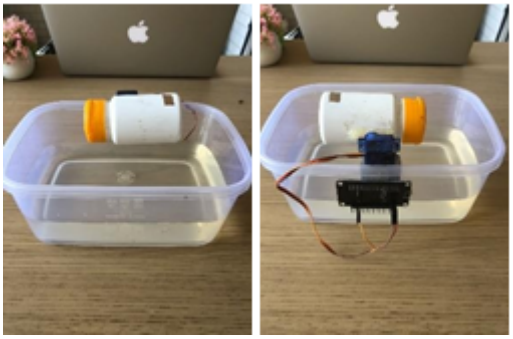
Figure 5. Program Flowcharts

4. RESULTS AND DISCUSSION

In this section, we will discuss the results of testing the tool both input and output as a whole to find out whether the device is running according to the function included in the program code[23]. Following are some of the test results and detailed discussion of this research.

a. Device Interface

Based on the results of the tool design in Figure 3, the following are the results of the tool which is made in small size but has the same function as the original size. The tool interface can be observed in Figure 6 below.



(a) (b)

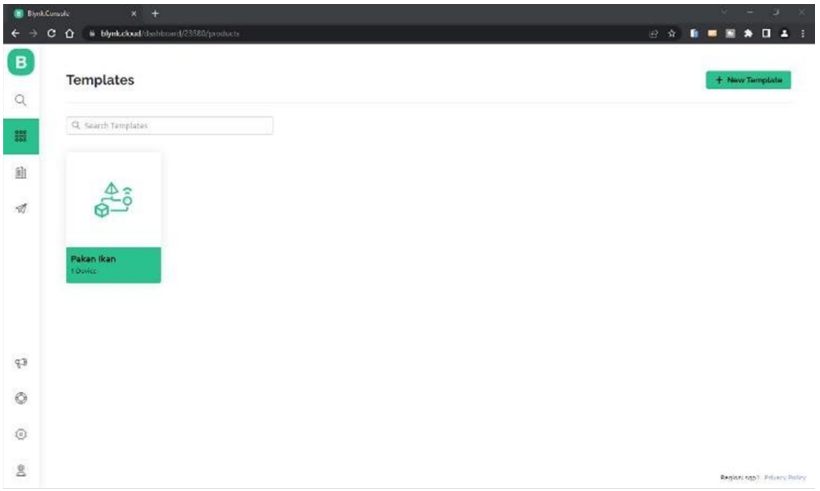
Figure 6. Tool interface

Figure 6a shows the front view of the tool, while Figure 6b shows the rear view of the tool. When the tool works to provide feed when the specified schedule is met, the container will rotate 90 degrees facing down and spill fish feed through the hole in the lid of the container[24]. The results can be seen in Figure 7 below.

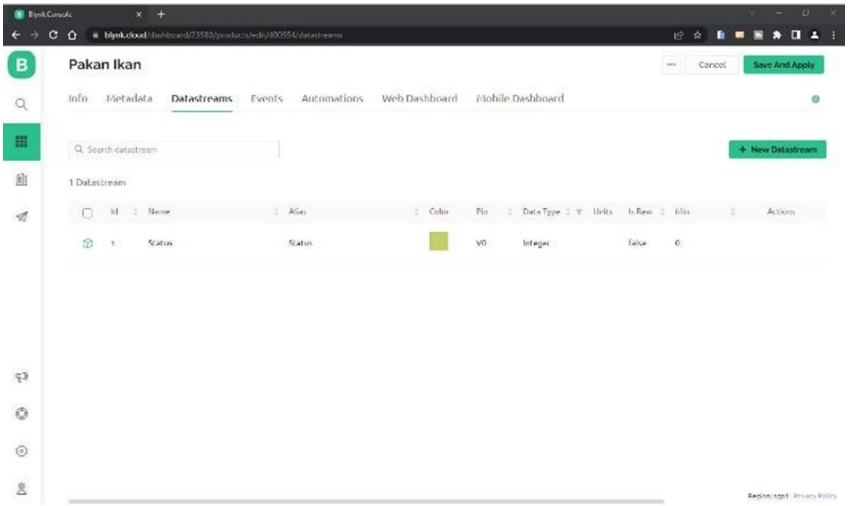
Figure 7. Feeding

b. Template Configuration and Blynk Datastream

Before scheduling on the Blynk application, you must first create templates and datastreams through the Blynk application. The template created is named Pakan Ikan with one datastream named Status. The template and datastream results can be seen in Figure 8 below.



(A)



(B)

Figure 8. Blynk Templates and Datastreams

Figure 8a shows the creation of a template in the Blynk 2.0 application, while Figure 8b shows the creation of a datastream on a template that has been made. This datastream will later change its status to 0 (close feed) or 1 (feed)[25].

c. Device Blynk

Furthermore, after creating templates and datastreams, you are required to make devices in the Blynk application according to the templates made before. The device name used is the same as the template name, Fish Feed. The results of making the device can be observed in Figure 9 below.

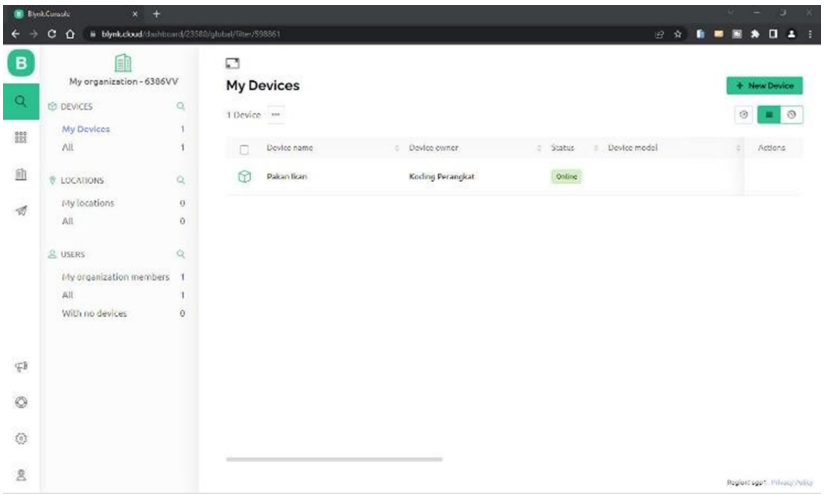
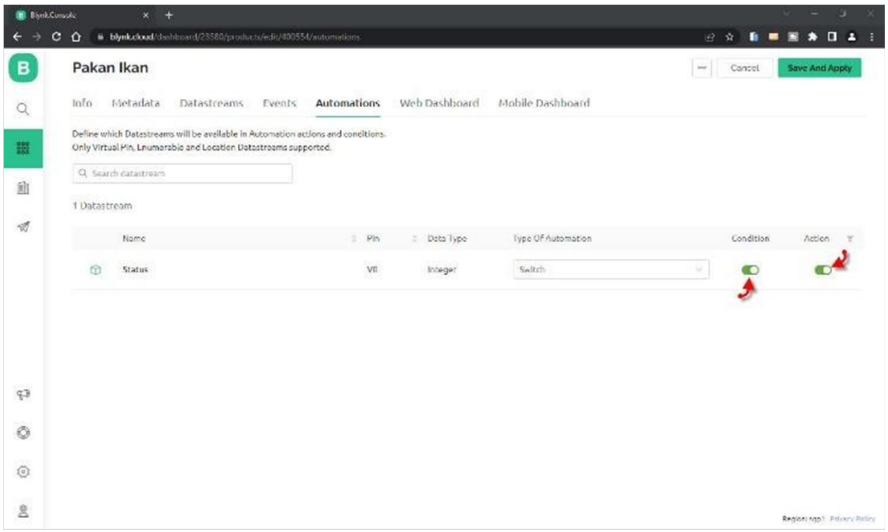


Figure 9. Device Blynk.

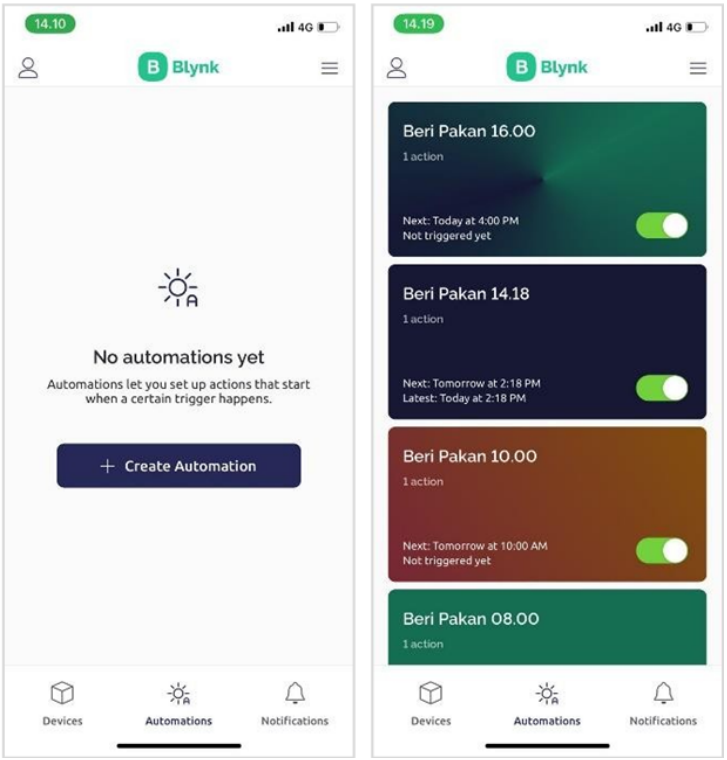
This device will read whether this automatic fish feeder is connected to Blynk or not.

d. Scheduling (Automations Feature) Blynk 2.0

The main step taken is to make a schedule through the automations menu in the Blynk application. The schedule created is a schedule for controlling the status of the device through the Status datastream that was created previously. The results of scheduling can be observed in Figure 10 below.



(A)



(B And C)

Figure 10. Scheduling with Blynk 2.0 Automations Feature

Figure 10a shows the settings that must be made to the datastream that is made so that the automations feature in the Blynk 2.0 application can be activated. Figure 10b shows the conditions before scheduling on the Blynk mobile application, while Figure 10c after scheduling. Here it is also shown that at 08.00, 10.00, 14.18 have been given feed. This can be seen in the information at the bottom of each schedule "Next Tomorrow at … " if you have been given food on that schedule, while at 16.00 has not been given feed with the status "Next Today at 4.00 PM"

e. Trial Results

The following are the results of several experiments conducted on the devices that have been made. The experimental results can be seen in table I below.

Tabel 1 Experiment Results

No	Percobaan	Jadwal	Jam Sekarang	Status Pakan
1	Percobaan 1	08.00	08.00	Buka
2	Percobaan 2	10.00	10.00	Buka
3	Percobaan 3	12.00	11.00	Tutup
4	Percobaan 4	14.00	14.00	Buka
5	Percobaan 5	16.00	15.30	Tutup
6	Percobaan 6	17.00	17.00	Buka

Based on the test results in table I, it shows that the scheduling was successful. When the schedule is determined according to the current hour, it will open the feed (feed), otherwise if it is not the same, it will be closed.

5. CONCLUSION

The conclusion that can be generated based on the results of testing the tool in this study is that scheduling through the automations feature in the Blynk 2.0 application was successfully carried out. This will certainly be very effective and facilitate the feeding of ornamental fish.

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