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NodeMCU ESP8266 Cat Feeding and Monitoring Tool Prototype using Telegram

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Article Info	ABSTRACT
	Currently, many pet owners, especially cats, cannot feed their beloved cat regularly because they have activities outside the home. Therefore, an automatic cat feeding and monitoring system based on NodeMCU ESP8266 was designed using a telegram to make it easier for humans to feed their favorite animals. This research was conducted by designing an automatic cat feeding device and providing information to the owner via a telegram that was connected to the cat owner's smartphone. Telegram will receive a message when the food has been issued according to the schedule in the form of the time of removing the food and the weight of the food. Telegram will also notify you when a cat approaches and is eating.

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1. INTRODUCTION

Cats are one of the most common carnivorous mammals kept by many people. Apart from being cute, cats can also be directed. Most people keep cats as pets [1,3,7]. Types of cats that are usually kept as pets are Angora cats, Persian cats, and street cats. Usually, cats that can be used as pets at home are 3 months old, because 3 month old cats can already be vaccinated, and can already be fed cat food.

For cat keepers who have a lot of activities and have to leave the cat at home for a long time so that they cannot prepare food for the pet cat, a tool that can feed the pet cat automatically is needed, because with this tool the pet cat still gets food according to its diet so that cat is well cared for. From the problems above, an idea emerged from the author on how to design a feeding device and monitor the rest of the cat's feed using telegram. Therefore, the author plans to make an automatic cat feeding place through a scientific writing task entitled "Design and Build an Automatic Cat Feeding and Monitoring System based on NodeMCU ESP8266 using Telegram". The function of this tool aims to make it easier for cat owners who have difficulty feeding their cats when they are not at home. This cat feeding tool can work automatically and can also be controlled via telegam connected to an internet connection where this tool uses a servo motor to open food containers according to a predetermined time. Then, it will display the time, the weight of the food removed, and the distance of the cat that approached on the telegram page that had been created.

2. RESEARCH METHOD

The research method used in the compilers of this writing, namely [2,5,6]:

1. Literature Study The intended literature study aims for authors to study and collect data from various sources such as books, journals, and the internet where the contents of these sources are used as references in writing.
2. Design The author designs the components of an electronic circuit, which is designed according to the input, process, and output of the tool to be made.
3. Trial The trial aims to prove that the tool that has been made by the author works and produces output as desired.

3. RESULTS AND DISCUSSION

The NodeMCU ESP8266 voltage source is obtained through a charger or power bank. NodeMCU ESP8266 will initialize the pins of the components used and read the program in which the SSID and password of the WiFi network are used. After the NodeMCU ESP8266 is active, all components will turn on automatically and the user will receive a message via telegram if all components are ready for use.
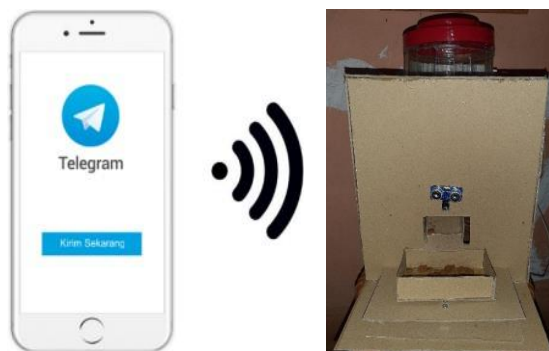

Figure 1. Design of Animal Feeding Equipment

Then we open the telegram application on the smartphone and enter the chat that has been created under the name "Animal Feeder" to monitor animal feeders automatically. After that, click "start" to start, it will automatically display "good connection" and "tool ready to use".
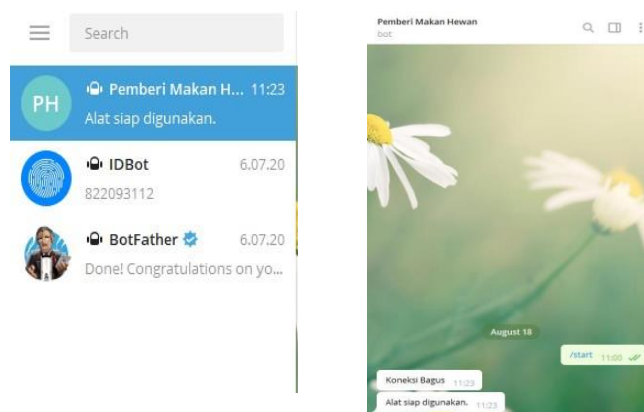

Figure 2. Telegram Initial View

After all the components and tools are ready to use, we just have to wait according to the time that has been set in the NodeMCU ESP8266 program. When the time comes, the user will receive a notification via telegram as shown in Figure 3.

Figure 3. Notifications when Food comes out

If there is an object that is approaching, the user will get a notification as shown in Figure 4.
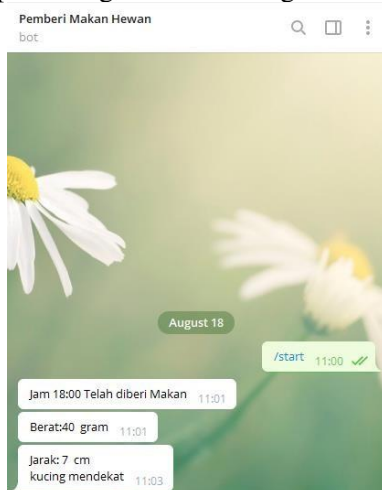

Figure 4. Notifications when a cat approaches

3.1 Testing Tool

In this section the tool will be tested in 3 days according to the specified time. The weight of the food that comes out of the tool will be compared with the weight of the food when it is weighed using a digital scale.

Table 1. Tool Testing Day 1

No.	Food Time Go out	Food Weight on Loadcell	Food Weight on Digital scales	Distance Cat Approaching
1.	07:00 WIB	26 g	34 g	7 cm
2.	12:00 WIB	26 g	32 g	11 cm
3.	18:00 WIB	28 g	36 g	8 cm

In Table 1 it can be seen that each food that comes out at a predetermined time has almost the same weight. The first day of weight released on loadcell average of 26 g. The difference in weight in the loadcell occurs because of the difference in pressure when the food is about to come out of the container, besides that the shape of the food also affects the size of the wet food. Meanwhile, when compared to a digital scale, the weight of the food is around 34 g. Usually this happens because the dining area is not balanced when measured using a loadcell, resulting in an unstable measurement that causes a large difference in weight. When looking at the distance of an approaching cat, it is quite stable when compared to a ruler.

Table 2. Tool Testing Day 2

No.	Food Time Go out	Day 2		Distance Cat Approaching
		Food Weight on Loadcell	Food Weight on Digital scales	
1.	07:00 WIB	28 g	35 g	10 cm
2.	12:00 WIB	26 g	35 g	9 cm
3.	18:00 WIB	31 g	35 g	8 cm

The second day of using this cat feeder, the weight released was quite stable. The time for removing the food was right and the difference in the weight of the food removed was almost the same. The distance when the cat approaches is very stable so there are no errors.

Table 3. Tool Testing Day 3

No.	Food Time Go out	Day 3		Distance Cat Approaching
		Food Weight on Loadcell	Food Weight on Digital scales	
1.	07:00 WIB	38 g	38 g	9 cm
2.	12:00 WIB	35g	35 g	10 cm
3.	18:00 WIB	36 g	36 g	6 cm

The third day of the experiment the weight of the food that came out was very stable, this was proven in Table 3 The weight of the food that comes out of the loadcell does not vary much every time that has been determined. The comparison between the weight of the food measured using a loadcell and a digital scale is already the same. The distance measured when the cat approaches is very stable and precise.

4. CONCLUSION

From the prototype of this tool, it can be concluded that the Automatic Cat Monitoring and Feeding System Design tool based on the NodeMCU ESP8266 uses RTC DS3231 to set the time for automatic food to come out at 07.00, 12.00, and 18.00 via a servo motor that opens at 400. removed will be weighed using the HX711 sensor or loadcell. Pet owners will receive notifications via telegram that has been connected to a smartphone with a display of the day, date, month, year, hour, and minute, as well as the weight of the food issued in grams. This tool also detects the presence or absence of an approaching object using an ultrasonic sensor. The ultrasonic sensor will detect when an object is approaching with the provisions of less than 20cm, the cat is approaching and is eating. Notifications will be sent via telegram. Based on the descriptions that have been explained, the author has: some suggestions for improving this tool, namely: Adding an LCD to the device so that it can still be monitored without using a smartphone. This tool can be added to the control system on the telegram, so that it can issue food without waiting for the specified time. The ultrasonic sensor can be replaced with a camera so that it can provide real and precise object information in the form of images. You can add sensors to food storage and notifications to Telegram, so you don't have to always check food

REFERENCES

[1] Alvian Rahmat., Ir. Sulistiyanto Nanang, MT., Zainuri Akhmad, ST., MT (2014), PROTOTIPE PENIMBANG GULA OTOMATIS MENGGUNAKAN SENSOR BERAT BERBASIS ATMEGA16, Skripsi Universitas Brawijaya.

[2] Mulya, Renaly Rahardian (2016), OTOMATISASI PENENTUAN HARGA BERDASARKAN BERAT DAN VOLUME BARANG PADA JASA PENGIRIMAN, Skripsi Universitas Airlangga.

[3] Novriandy, Rakhmad (2014) APLIKASI PENGOLAHAN DATA PENSIUN PEGAWAI NEGERI SIPIL (PNS) DINAS PENDIDIKAN PADA BADAN KEPEGAWAIAN DAERAH DAN DIKLAT KOTA PALEMBANG. Other thesis, Politeknik Negeri Sriwijaya.

[4] Penjelasan Tentang Hewan Kucing dan Jenis-jenisnya PenjelasanTentang id.wikipedia.org/wiki/Kucing. 2019.

[5] Razi, Fakhrur (2017) RANCANG BANGUN ALAT PEMBERI MAKAN KUCING ANGGORA SECARA OTOMATIS. Skripsi Politeknik Negeri Padang.

[6] Silvia, Ristani Pungky (2017), APLIKASI PEMBERI MAKAN KUCING BERBASIS INTERNET OF THING (IOT), SkripsiUniversitas Telkom. Bandung.

[7] Susanto Edi, Dwi Nuri Putri Dharma, Mohammad Iqbal (2013), PROTOTIPE PENIMBANG GULA OTOMATIS MENGGUNAKAN SENSOR BERAT BERBASIS ATMEGA16, Seminar Nasional Aplikasi Teknologi Informasi, Universitas Gunadarma.