



Smart Pet Care System Using Arduino Iot Cloud

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Abstract: Automation can be done independently by machines, but it can be enhanced with monitoring and controlling features with the help of IoT. As the world becomes increasingly interconnected, the Internet of Things (IoT) creates an extensive network of devices that regularly exchange data. While this interconnection is happening in businesses and throughout organizations on a global level, it's also happening in individual homes. Smart home devices and gadgets are becoming more popular with consumers who enjoy having all their devices interconnected to serve the purpose of increased convince, comfort, energy efficiency and most importantly personalization which is one of the focus points on this project, with the help of automation of electronics and IoT the experience becomes much more personalized for the user. We propose a pet feeder system which is used to remotely and timely provide pets with food. Along with their intake monitoring system. Most of the system will be automated and the pet eating habits can be monitored remotely. The system in final stages will consist of a food dispensing system with a mobile app and a web dashboard. Water dispensing can also be implemented based on product space and pet consumption habits.

Index Terms - Automation, IOT, Interconnection, Dashboard, Instrument panel.

I. INTRODUCTION

Welcome to the Smart Pet Care System, a cutting-edge solution designed to make the pet feeding process simpler and more efficient. Our project is dedicated to providing pet owners with a smarter, more automated way of caring for their furry friends. By utilizing the latest technology and an intuitive user interface, our system ensures that your pets are well-fed, healthy, and happy, even when you're not at home. The Smart Pet Care System is a highly advanced feeding device that is capable of dispensing pet food in a specified quantity at specific periods of time, which can be easily controlled and customized through a web dashboard or mobile app. With our system, you can effortlessly measure out the right portion sizes for your pets, set a feeding schedule that works for their unique needs, and enjoy peace of mind knowing that they are being properly nourished. Our Smart Pet Care System is a product of extensive research and development, incorporating state-of-the-art technology to offer the most innovative and reliable solution on the market. By using the latest sensors and algorithms, our system can detect when your pet is near the feeder and dispense the appropriate amount of food, without the need for human intervention. We understand that your pets are an essential part of your family, and that's why we've designed the Smart Pet Care System to make pet feeding as easy and stress-free as possible. Our system is built to integrate seamlessly into your lifestyle, with a sleek and modern design that complements any home décor. At Smart Pet Care System, we are committed to providing pet owners with the best possible care for their pets. Our team is dedicated to delivering exceptional customer service and ensuring that every aspect of our system is of the highest quality. We believe that our innovative solution will make a positive impact on the lives of both pets and their owners, and we're excited to be at the forefront of this revolution in pet care. In conclusion, the Smart Pet Care System is an advanced solution that simplifies the pet feeding process, ensuring that your pets are well-fed and healthy even when you're not around. With our intuitive user interface, cutting-edge technology, and commitment to excellence, we're confident that our system will revolutionize the way you care for your furry friends. Join us on this journey of innovation and discover the joy of hassle-free pet care!



Fig 1&2: 3D Render of the device and Smart pet care device

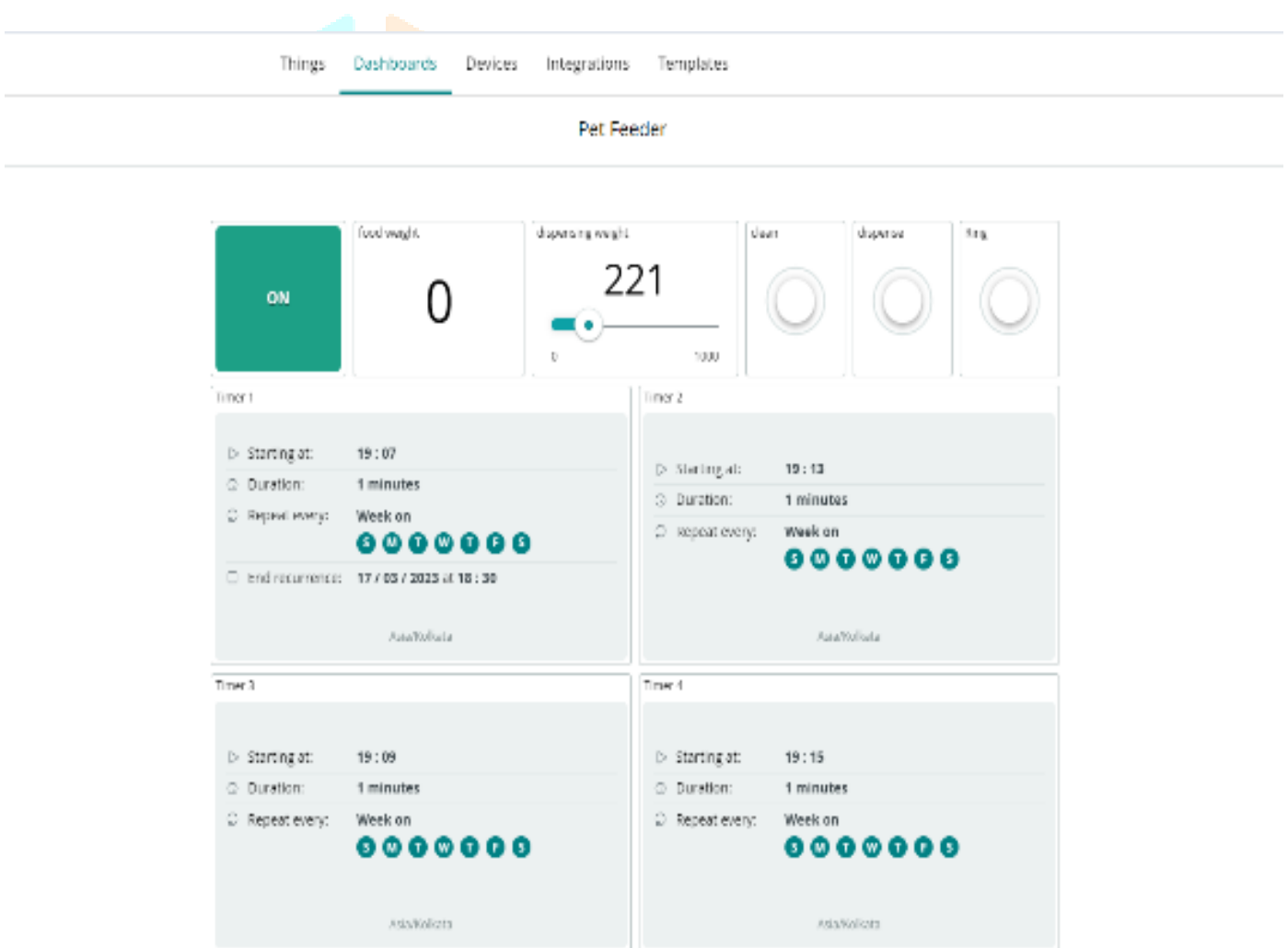


Fig 3:- Web Dashboard

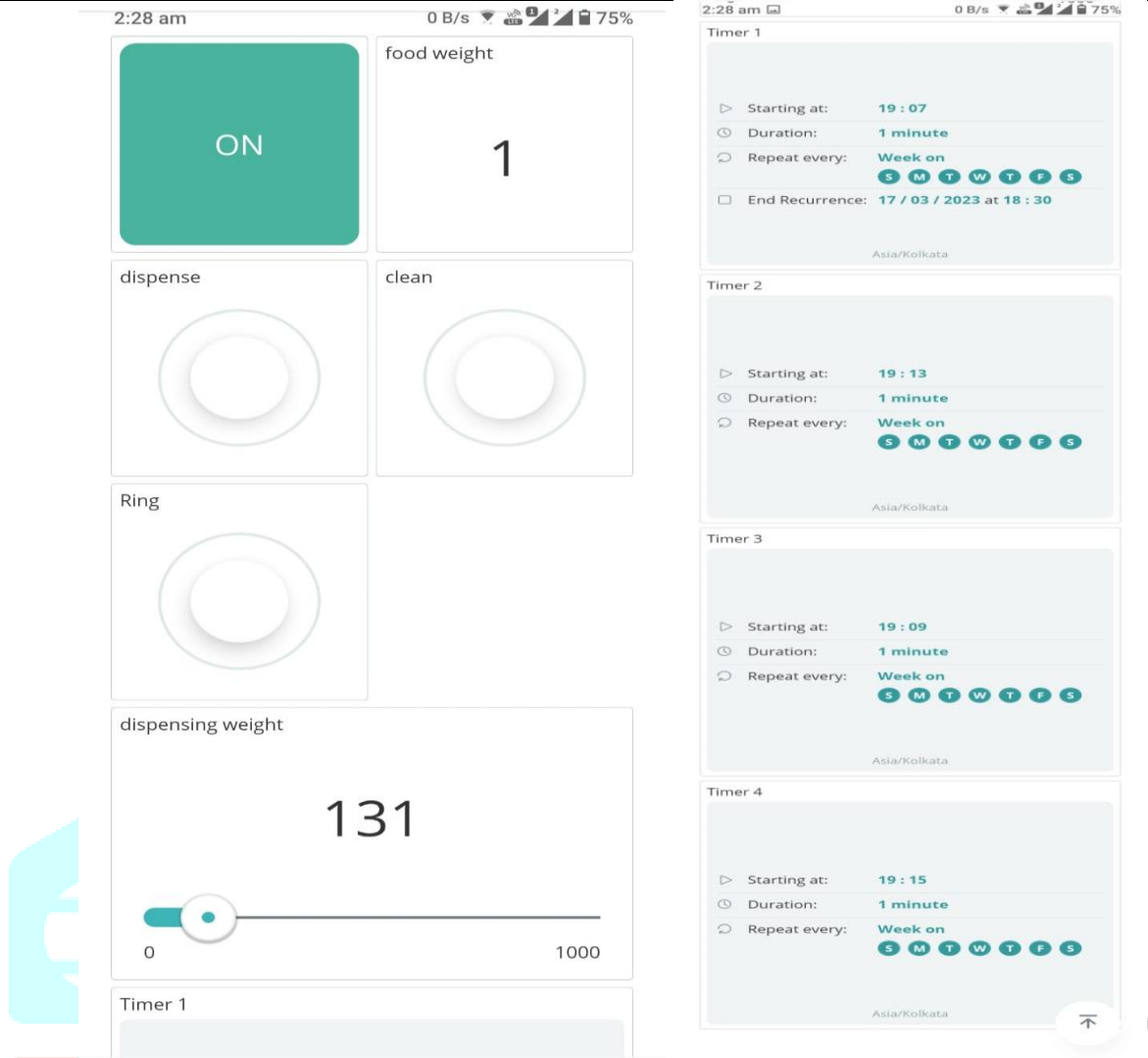


Fig 4&5:- Mobile Dashboard

II. CIRCUIT DIAGRAM AND HARDWARE USED

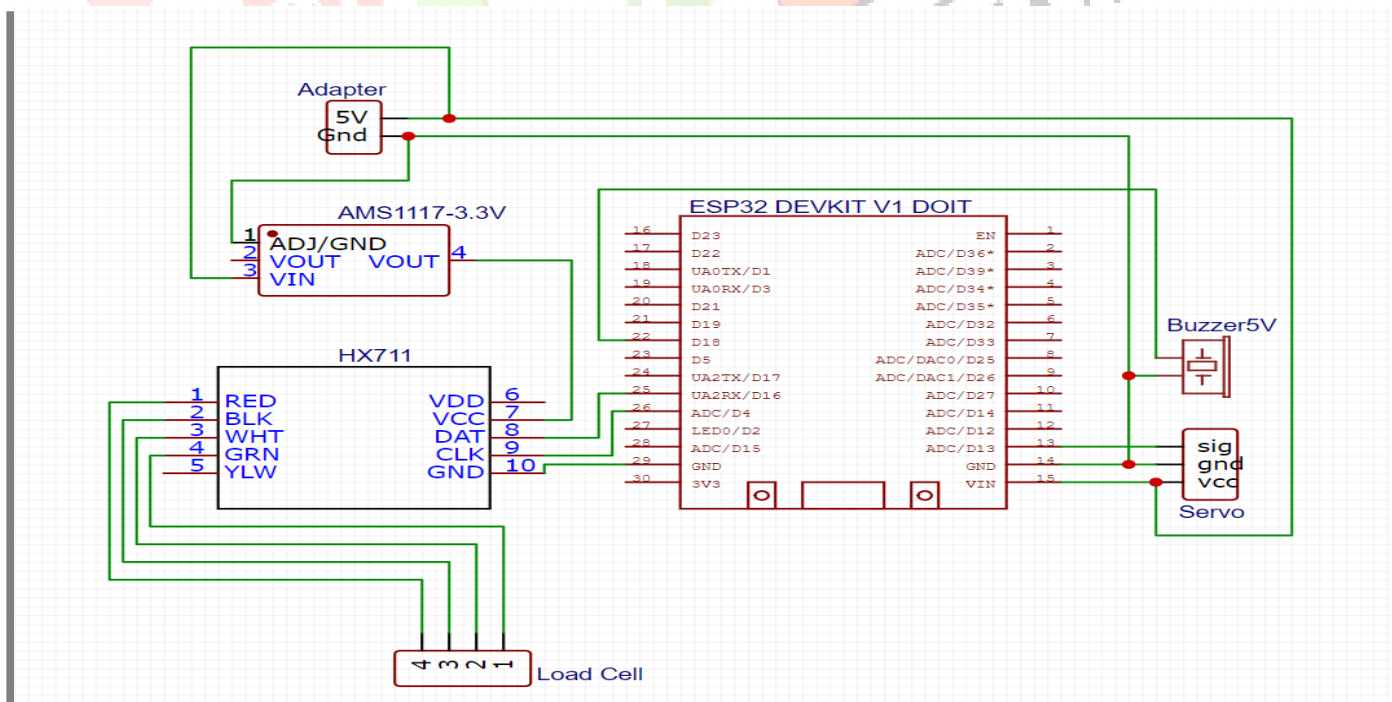


Fig 6:- Circuit Diagram

This Smart pet care system is custom designed both in terms of shape and size as well as the electronics and the hardware are embedded on a custom PCB. This outer casing of this device is totally 3D Printed. The device is easy to install and portable and it has a long battery life, however it is not rechargeable. This device is very power efficient and a battery can be added in the future to make it more useful.

The important components used to make this device are ESP32D Wroom Module, 10KG Load Cell, Hx711 Amplifier and a Buzzer. These components play a key role in the functioning of the Smart pet care system, which makes it very easy to use.

III. WORKING OF THE SYSTEM

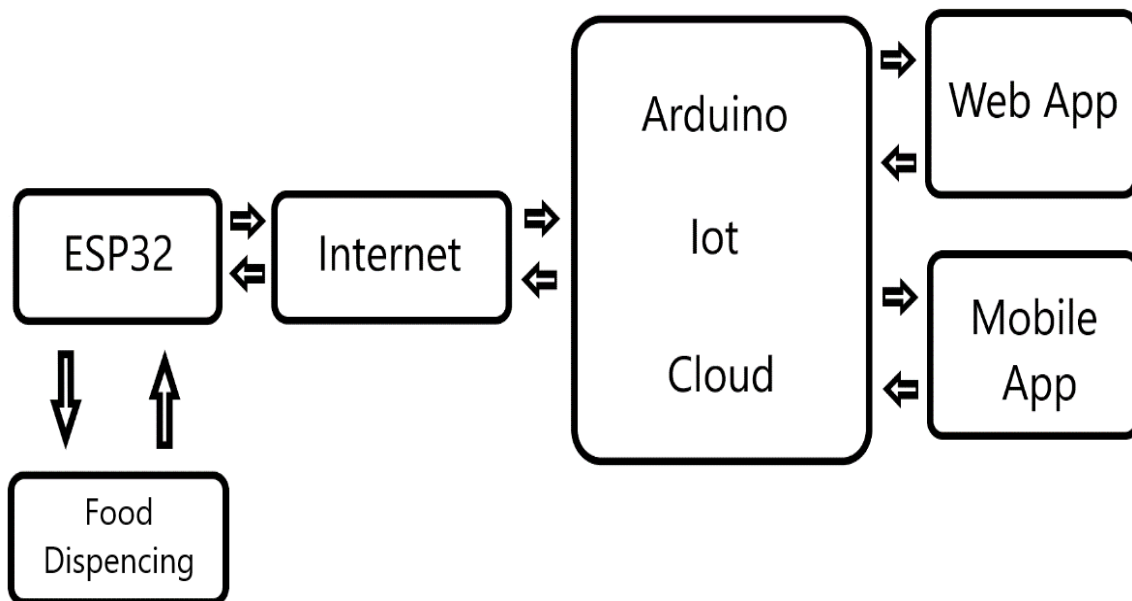


Fig 7:- Flow Chart to explain the working of the Device

- After the assembling the device. The device needs to be powered on. The device automatically connects to the given Wi-Fi. And the cloud server.
- Once this is done the user needs to program the device and the schedules using the web dashboard or the mobile app.
- In order to operate the device the user logs into his account and then configures the device.
- The user sets the quantity of food which needs to be dispensed by the device each time.
- The user selects the timeslots (using the 4 schedulers present in the app) at which the device needs to dispense the food, in the given quantity.
- The user then needs to load the device hopper with the required food.
- The user can also manually dispense the quantity of the food using the dispense button in the app.
- The app constantly shows the amount of food present in the bowl.
- The app also has a clean feature, with which the device automatically cleans itself by ejecting any accumulated particles.
- The dispensing of the food is triggered by the cloud servers based on the user's settings. Once this is triggered, the cloud servers send data to the microcontroller in smart pet food dispenser, using MQTT.
- The device then checks the weight of the food in the bowl using a load cell. Which is placed under the bowl.
- If the bowl is full the device will not dispense any food. And if the quantity is less than the required quantity, the device rotates the servo motor which then rotates the shaft dispensing the food in a mechanical motion.
- Once the quantity of the food reaches the specified amount the device starts beeping. And the pet is informed.
- The device stops beeping only after the pet eats all the food.

IV. RESULTS AND DISCUSSION

The device has been successfully made along with the dashboard. The user is able to perform all the necessary function using the provided web dashboard and app interface.

This result can be explained in three states which are as follows:-

1. Initial state:



Fig - 8:- Device in Normal State

2. Loaded State:



Fig - 9:- Hopper Filled with sample food.

3. Dispensed State:



Fig - 10:- Dispensed food with a buzzer alert.

V. APPLICATIONS

- Help people monitor their pet's locations and behavior.
- Keep track of their health.
- Assist in training and analyze their activity levels.

VI. CONCLUSION

Nowadays we can see lots of new devices invented with the aid of IoT. We believe that IoT also can change the pattern of the existing structure of the pet care system. We have proposed a new pet care system that can feed the pets while the owners are absent at their homes and can monitor their movement and status and also control its defecation pad through the owner's smart phones. The proposed system is distinctive from others in terms of that the proposed system is based on IoT technologies, which uses lots of sensor and wireless communications. Therefore, the proposed system is not restricted in space and time only if the wireless communications are provided.

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