

# PROJECT PROPOSAL

# SMART PET

# FEEDER



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## INTRODUCTION

For pets to remain healthy and happy, proper diet and care are essential. Many pet owners face challenges in maintaining consistent feeding schedules due to busy lifestyles or other commitments. This can lead to issues like overfeeding, underfeeding, and increased pet food costs. To address these challenges, we propose the development of a smart pet feeder that automates the feeding process, ensuring that pets receive the right amount of food at the right time. To give pet owners a practical and effective solution, our smart pet feeder will incorporate functions like pet detection, portion control, scheduled feeding, and remote monitoring.

## BACKGROUND AND CONTEXT

### Explanation of the Problem / Opportunity

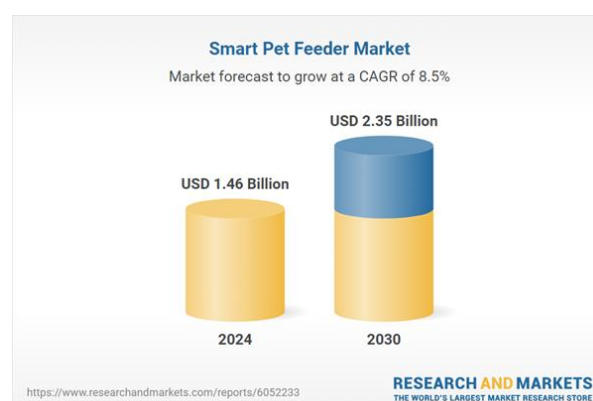
Traditional feeding methods rely on manual dispensing, which can be inconsistent and time-consuming. Current automatic pet feeders may lack advanced features like individual pet recognition, customized feeding schedules, and remote monitoring. In addition, some pet owners may be physically disabled, which makes it difficult to feed their pets. Therefore, there is a need for a system that can automatically dispense the correct amount of food at the right time.

### Literature Review / Prior Research

Smart pet feeders utilize various technologies to automate and improve pet feeding. IoT-based systems enable remote control and monitoring, often incorporating sensors for precise food portioning (e.g., weight sensors) and pet proximity detection (e.g., ultrasonic sensors). Deep learning and computer vision techniques are increasingly used for pet recognition, ensuring multiple pets are fed. These systems aim to address issues like overfeeding and underfeeding while providing convenience for owners. [2]

### Why is this project necessary and timely?

A smart pet feeder is necessary to provide a reliable, automated, and data-driven solution for modern pet care. It ensures pets receive proper nutrition, promoting their health and well-being by delivering consistent feeding schedules and appropriate portion sizes. It provides remote feeding management, convenience, and peace of mind for owners. Additionally, proprietors can manage food supplies and budgets with the use of data analysis and forecast.



This need is further underscored by the growing market for smart pet feeders, driven by increasing pet ownership and a focus on pet wellness. Market research indicates significant growth in this sector. For instance, the global smart pet feeder market size is expected to reach USD 2.35 billion by 2030, expanding at a CAGR of 8.46% from 2025 to 2030 (GlobeNewswire).

## OBJECTIVE

This project's primary objective is to develop a smart pet feeder that automates the feeding process, addressing the challenges faced by busy or physically disabled pet owners. The system aims to provide regular and correct food amounts to pets, ensuring their health and well-being. To achieve this, the project includes several key objectives:

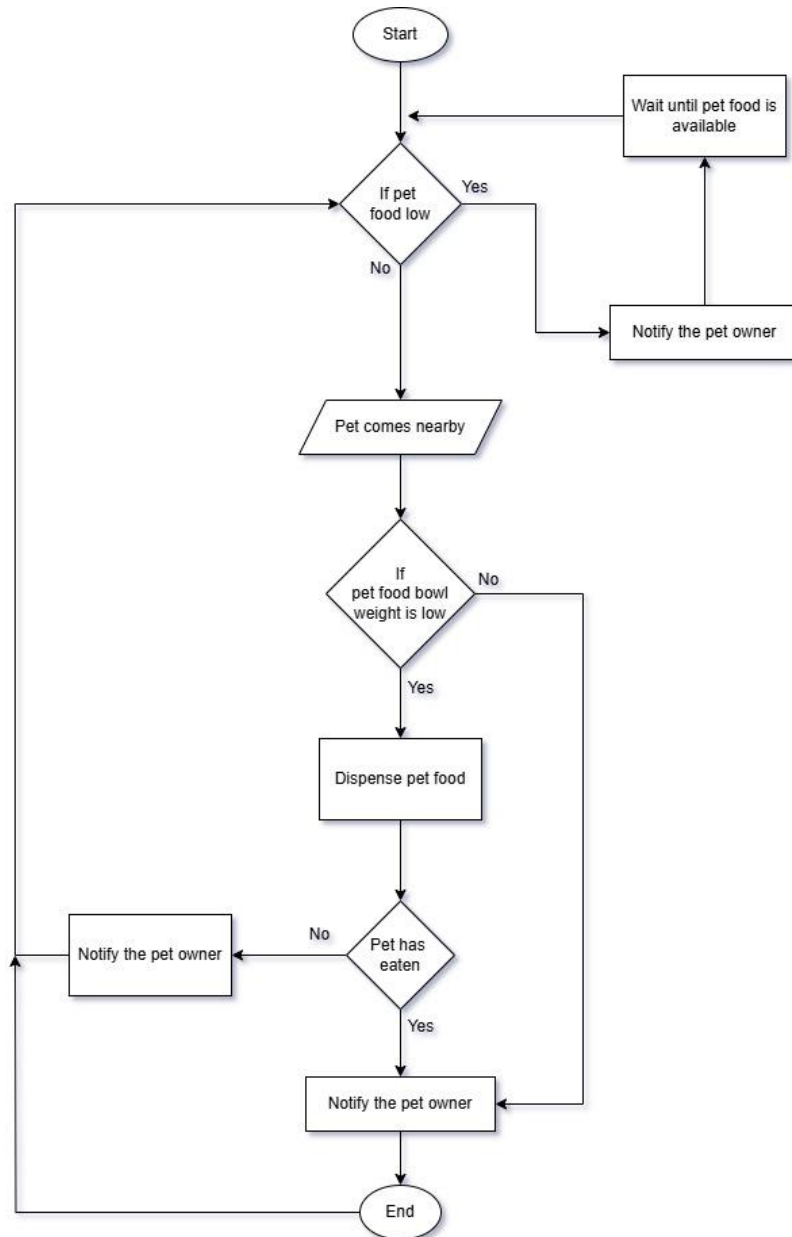
- Automate food dispensing based on pre-set schedules and individual pet identification.
- Implement computer vision techniques for pet recognition.
- Incorporate a weight sensor to control food portions accurately.
- Enable remote control and monitoring through a mobile application.
- Track pet feeding patterns to provide insights into their habits.
- Design components that are easy to clean, promoting hygiene and minimizing power consumption.
- User can manage food supplies and budgets with the use of data analysis and forecast.
- Provide an intruder warning for added security

## PROJECT SCOPE

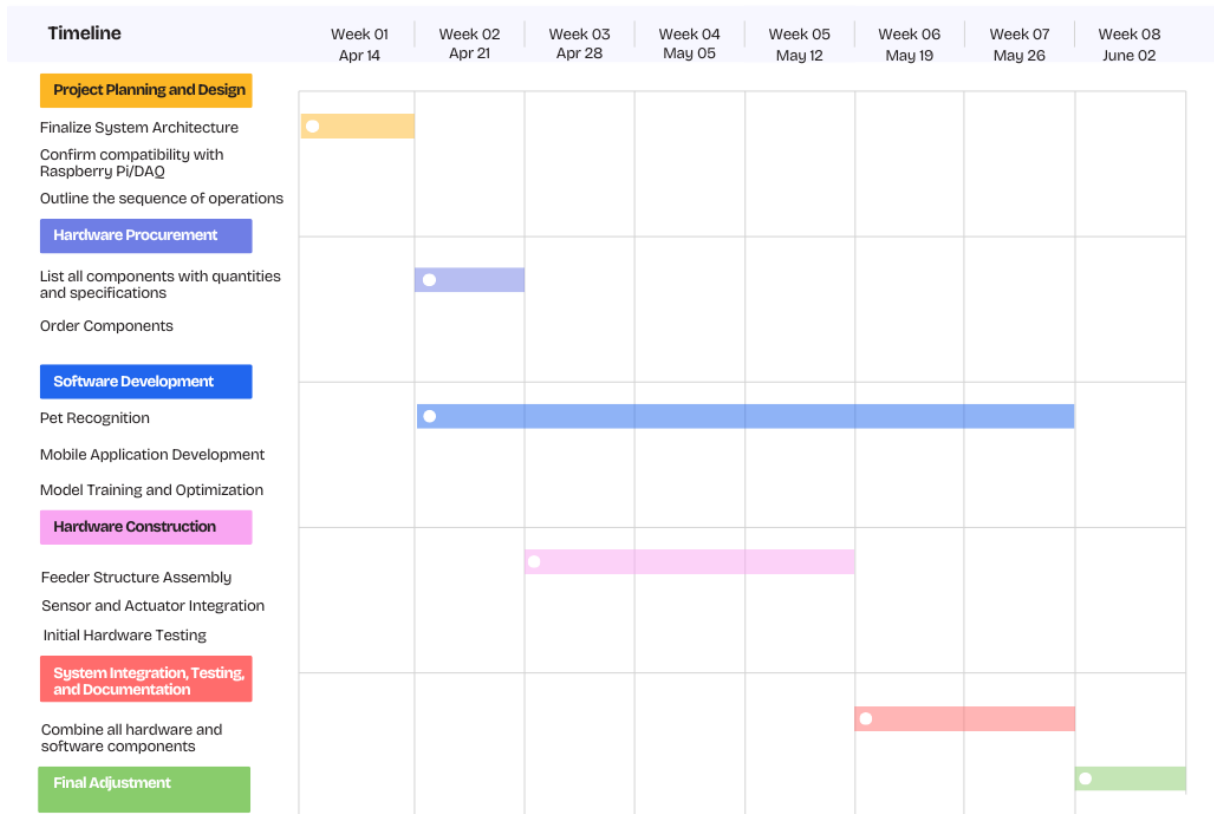
The scope of this project is focused on the development of a functional smart pet feeder prototype. This covers the feeder's construction and design as well as the creation of the software and algorithms required to run it. This involves the integration of hardware components such as the Raspberry Pi, DAQ card, sensors, and actuators. Additionally, a mobile application will be developed to enable remote control and monitoring of the feeder. Lastly, extensive testing and assessment will be carried out to guarantee the system's functionality and performance.

## METHODOLOGY

Hardware components, including sensors (weight, ultrasonic, camera) and actuators (servo motors) will be integrated with a Raspberry Pi and DAQ card. Software development will involve programming for data acquisition, actuator control, and mobile app communication. AI/ML techniques are used for pet recognition.



## TIMELINE



## CONCLUSION

The goal of this project is to create a smart pet feeder that offers pet owners a complete solution for handling their pet's nutritional requirements. The smart pet feeder will have capabilities like portion control, pet recognition, automated feeding, and remote monitoring by combining cutting-edge technology like computer vision, machine learning, and the Internet of Things. This will decrease food waste, give pet owners convenience, and enhance the health and well-being of their pets. The successful completion of this project will open the door for further advancements in the rapidly expanding field of smart pet care technologies.

## REFERENCES

- [1] O. E. Castillo-Arceo, R. U. Renteria-Flores, and P. C. Santana-Mancilla, "Design and Development of a Smart Pet Feeder with IoT and Deep Learning," pp. 63–63, Nov. 2024, doi: <https://doi.org/10.3390/ecsa-11-20487>
- [2] H. Kumar, Bharath, B. N. M, G. G. S, and Meghana Gowri G, "AUTOMATIC PET FOOD DISPENSER USING DIGITAL IMAGE PROCESSING," IJARCCCE, vol. 12, no. 5, May 2023, doi: <https://doi.org/10.17148/ijarcce.2023.125139>

[3] M. Razali and M. Lazam, "Smart Pet Feeder System and Big Data Processing to Predict Pet Food Shortage," Turkish Journal of Computer and Mathematics Education, vol. 12, no. 3, pp. 1858–1865, 2021, Available: <https://pdfs.semanticscholar.org/c75f/f58f2bb079dd0839edd98eeced9d01c93565.pdf>