# Step 1

## Understanding and Defining the Problem

### Problem Statement

The local animal shelter wants a low-cost automatic feeder to dispense food for both cats and dogs at specific times. The ideal system should monitor food consumption and alert surrounding staff if any blockage occurs; this could be an example of situations where the pet hasn’t eaten, or the feeder is low in its kibble supply. The shelter emphasized that they want simple and affordable technology, so components such as servo motors and sensors are appropriate parts of this system. Ultimately, the automatic pet-feeder allows the members at the local shelter to save time, cost and manpower.

### What Does a General Low-Cost Pet-Feeder Have?

1. Sensors
2. Timers
3. 3. Portion Control Management = The appropriate amount of food that is advisable to be consumed by both cats and dogs, set by the local shelter
4. Amount of Food Consumption Tracker

### What Features Does this Pet-Feeder Have?

1. Storage Container that stores the dry food (kibble)
2. Servo motor that dispenses set amount of food
3. Timer
4. Powered by electricity
5. Small display log to output messages or comments
6. Buzzer for letting out auditory alert
7. Attached food bowl for the kibble to be dispensed into

### What are the Inputs Needed in this System?

1. Weight Sensor = To verify if the proper amount of food (kibble) has been dispensed and the remaining amount of food left after a feeding time has lapsed.
2. Real-Time Clock = To check the current time and compare against the scheduled feeding time.
3. Food Level Sensor = To measure the amount of dry pet food (kibble) that is within the storage container that dispenses food into the pet eating bowl.

### What are the Outputs Within this System?

1. Servo Motor = Dispenses food by rotating the servo motor.
2. Alerts (Comments) = Presented in the display log when *food is not eaten* or there is *low level of food* in the storage container.
3. Buzzer = Auditory alert for the surrounding staff.
4. Display Log = For comments to be displayed.

### What are the Possible Assumptions or Limitations of this System?

1. The feeder only dispenses dry food of one kind.
2. The animal shelter can cover the cost of electricity for the feeder.
3. Staff are readily around to listen to alerts and the buzzer.
4. Only one pet is being fed at a time.
5. The pets do not have any allergies or problems with the kibble.
6. The pets being fed are all adults and not kittens or puppies.
7. There is a constant power supply.
8. There is a small capacity for food storage.

### Block Diagram of the System

