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## Project Proposal

# SMART KITCHEN INVENTORY TRACKING AND PROTECTING SYSTEM

## TEAM EXTERMINATORS

### MEMBERS:

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## Introduction:

We are designing a system to track the status of ingredient containers placed on kitchen pantry and the fridge. This system helps to protect containers on pantry from animals.

## Team Members:

Nimesha Dilini - IoT and hardware design  
Kavindu Gayantha – AWS cloud services  
Madushanka Kahawa - Mobile Application Development



## Problems:

### Which cooking ingredients running low?

There are so much of cooking ingredients on the kitchen pantry. So we couldn't able to identify which ingredient is running low. Sometimes when we went to grocery shop we forget which cooking ingredients are running low.

### When these ingredients expire?

Another problem is always you are not remembering the expiry date of each ingredient in containers.

### How to protect kitchen ingredient bottles from animals?



Most common problem in pantry system is to protect the bottle of kitchen ingredients from animals like mouse, cockroach etc.;

### Where is the bottle of black pepper?

Here is another problem I faced in kitchen. In most of cases mother is the person who knows the state of each cooking ingredients. And she knows where each type of spices are places on the pantry. One-day mother got sick and I had to cook. But I am not familiar with places that containers are placed, so that It takes so much time for me to find some type of spices. But It will be easy for me, if I had a tracker of those containers with an indicator in those containers.

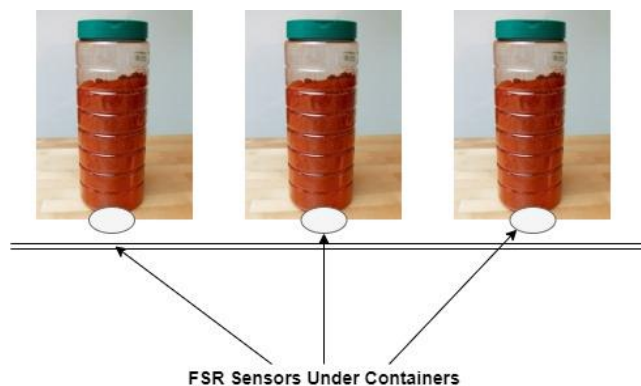
## Solution:

We are introducing a smart kitchen inventory tracking of spices and other containers in pantry and fridge. Also our system is able to protect kitchen items from animals. We design an IoT based system to track weight changes of each containers and showing, notifying updated features to user through a mobile application.

Here are the main features of our system,

### 1. Track inventory of kitchen items

provide real-time and automatic updates about the current availability of inventory. We are using weight measuring sensors (FSR-Force Sensitive Resistors) under each container. When the container weight decreases gradually those data are send to the AWS cloud.



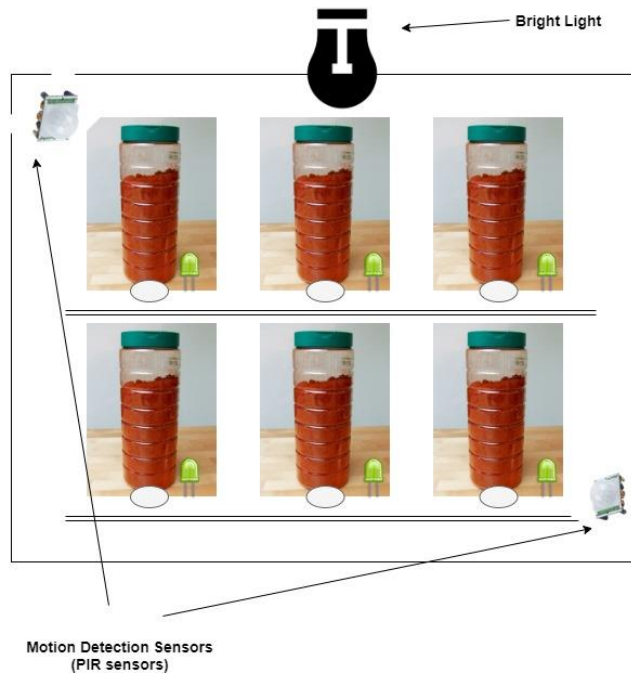
### 2. Expiration Notifications send to user – Mobile App

When the weight increases suddenly, that means user has refilled the container. So that system identifies this automatically and send data to cloud. The current date is saved as the date refilled and It can be used to identify weather items in container are expired or not.

User can manually add the estimated expire date of items by referring the refilled date. Notifications are send to user mobile app according to the instance.

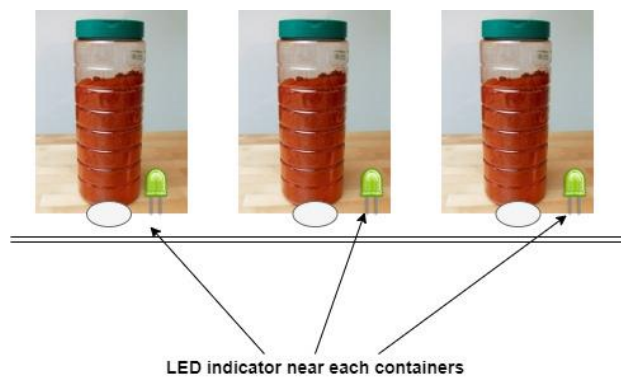
### 3. Protect the kitchen items from animals

We are using a PIR sensors to detect any motion of animals. User can set the protect time through the mobile app. As an example when user set the safe time from 11PM to 5AM, then the system identifies if there any motion occurs. If a motion detected in safe time, then a bright bulb lights up. This is only applicable to the pantry.



#### 4. Led indicator on each container

When unexperienced person is working in the kitchen, if user wants to find places where the certain spices are placed then he can select the spicy type through the mobile app and press find button. Then the led indicator near the container will lights up.

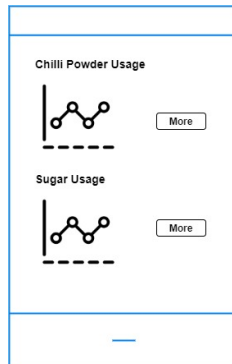


#### Mobile App

Smart Pantry			
Container	Weight	Last refilled on	
Chilly Powder	145g	12/02/2019	find
			Reset

## 5. Access historical inventory usage details – Mobile App

User can see the usage history of kitchen containers. From those data graphs user can identify the usage pattern control use of some ingredients. This can improve the healthiness of family and manage family budget



## 6. Create a list of ordering items (what user wants to buy from a grocery) – Mobile App

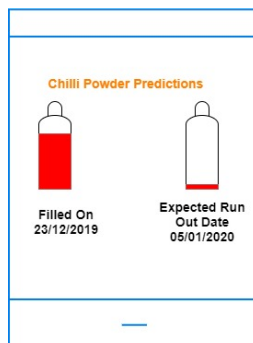
When kitchen items running low, then in some cases user buy wrong items from grocery. Therefore, user can create a list of items to buy through the mobile application.

### Shopping List #01

Chilli powder 200g  
Sugar 2kg

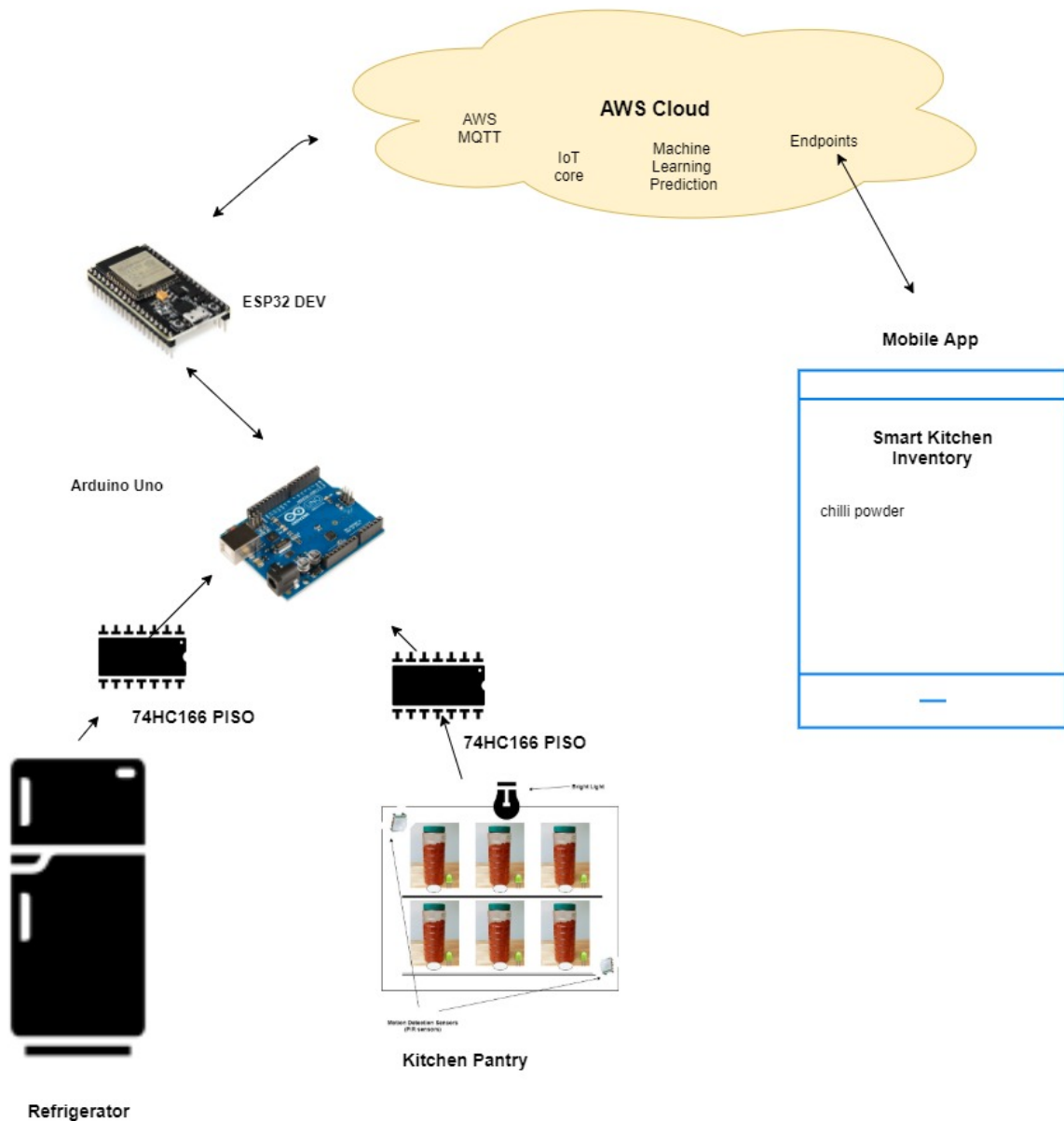
## 7. Predict the date of emptying – AWS cloud

We use a machine learning model to identify the usage of each ingredient in each container and predict the date of emptying it. Then user can identify when to buy items.



We can introduce this system to pantries and fridge that are already in user's kitchen. And this a better solution for women working with the busy life.

## Technical design:



## Hardware Components:

Esp32 dev Module  
Arduino-Mega Microcontroller  
74HC166 PISO  
FSR-402 sensors  
Led indicators  
Bright light  
Jumper Wires

## Software Design

### Mobile App:

Technologies – Flutter

AWS Cloud services - SNS

Arduino IDE

## Circuit Diagram:

