

Food Buddy

By: North Vista Primary School

Team: N.I.C.E (NVTPS Innovative Coders Emerge)

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Agenda

TOPIC	Presenter
1. Problem Statement	Yu Heng
2. Our Solution: A.C.E.D Approach	Gopal
3. Food Buddy Platform & App	Gopal
4. Self-sustainable Flywheel Design	Gopal
5. Demo of Prototype	Gopal / Yu Heng / Jacob
6. Code Description	Gopal
7. Future work & Conclusion	Mihika

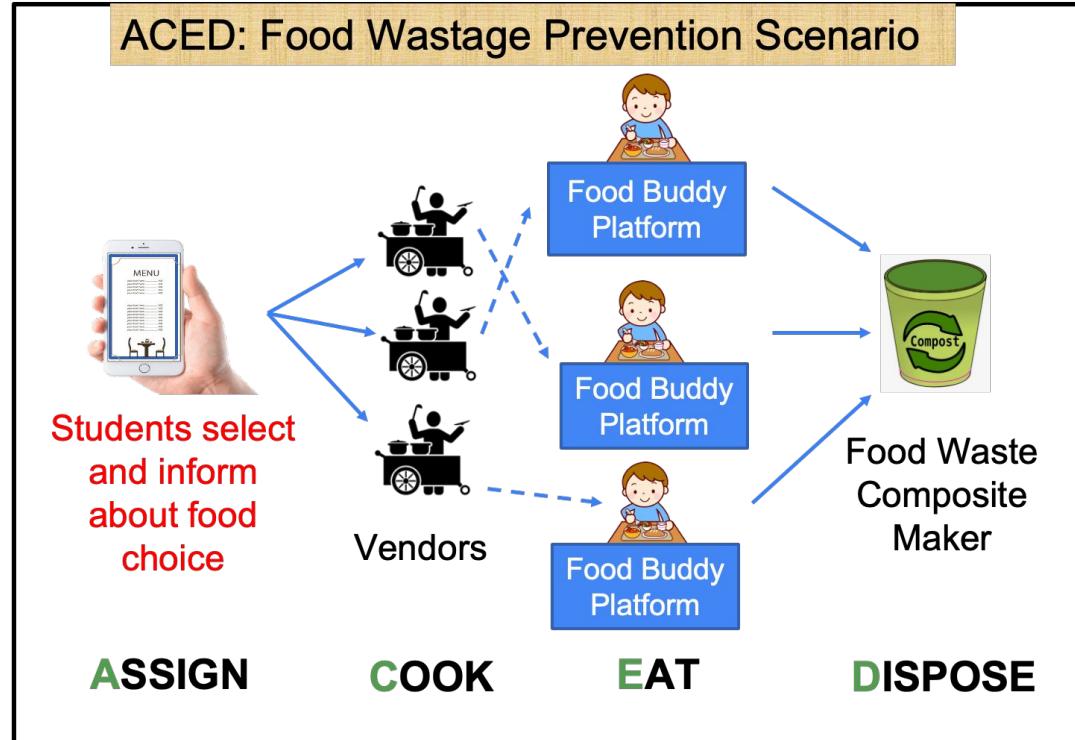
Problem Statement

Research shows that 8% of the world's food wastage happens in schools. Recycling food waste does not solve the problem of having to source more food which in turn affects our food security. Since Singapore exports most of its food supply, we need better ways to **prevent food wastage**.



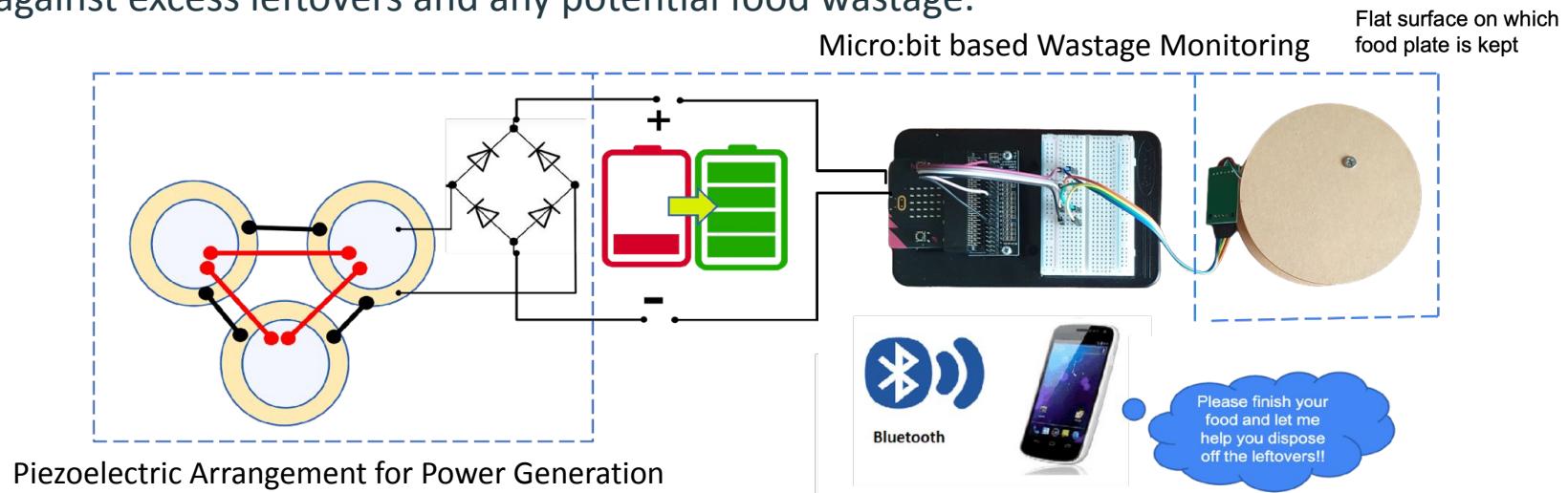
Solution: ACED Approach

Food buddy takes the A.C.E.D (Assign, Cook, Eat, Dispose) approach which is an end-to-end solution for preventing food wastage from food ordering to waste disposal.

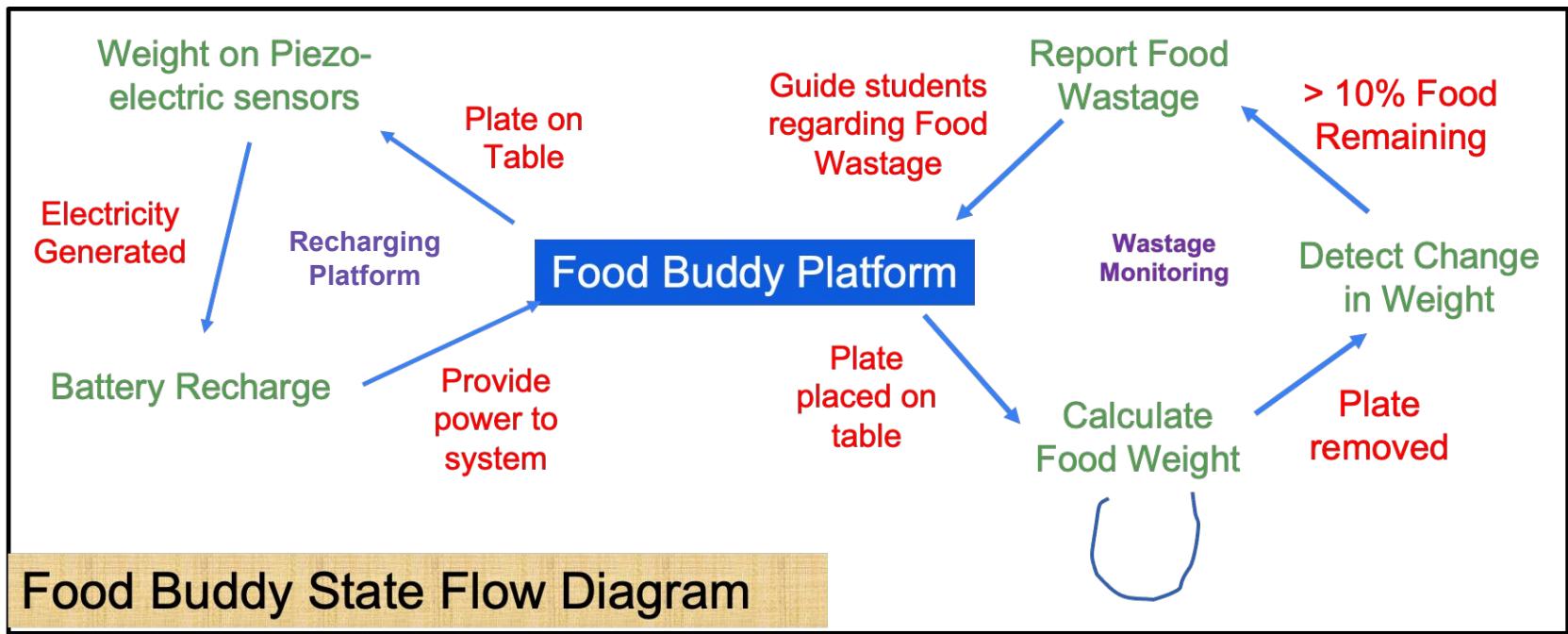


Solution: Food Buddy Platform

The food buddy platform takes a **self-sustaining approach** to power-up the micro-bit based setup which monitors food wastage, converting the weight of food laden plates into power. The micro:bit based food monitoring solution senses weight and warns against excess leftovers and any potential food wastage.



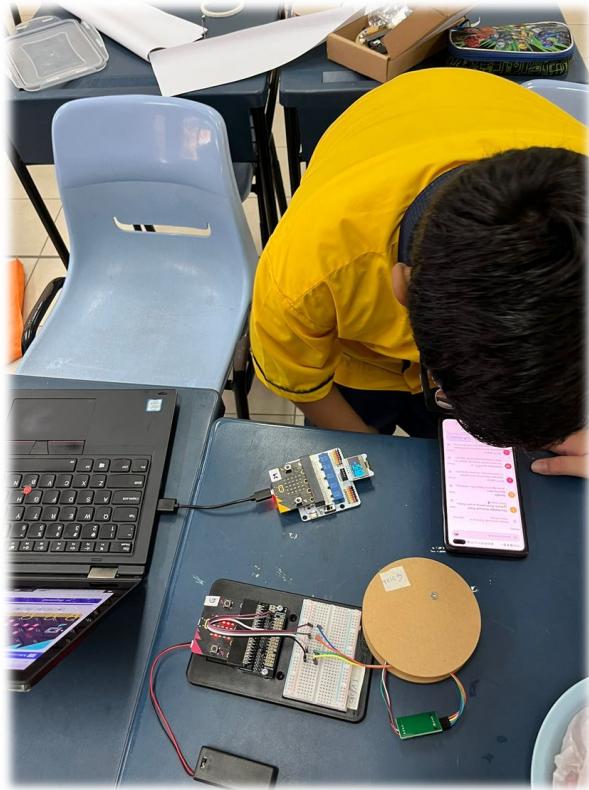
Solution: Self-sustainable Double Flywheel Design



Making and Testing of Prototype



Making and Testing of Prototype



DEMO of PROTOTYPE

Hardware / Software Used

- Micro-Bit (Weight Monitoring)
 - Bread-Board
 - HX711 ADC for Weight Scale
 - Piezo-electric Disc's
 - Diodes
- IOT-Bit (I/P: Radio, O/P: Telegram)
 - Micro:Bit
- MIT App Inventor
- Telegram Bot

CODE

Select Food UI

Login Page:

Username and Password Check

Login Page

Username :

Password :

Login

Select Food UI

Options Page:
Vertical Scroll

Day: Friday

Menu:

Choose what you want:

Chicken Rice
Laksa
Pizza
Pancakes



Chicken Rice

Day: Friday

Menu:

Choose what you want:

Chicken Rice
Laksa
Pizza
Pancakes



Laksa

Day: Friday

Menu:

Choose what you want:

Chicken Rice
Laksa
Pizza
Pancakes



Pizza



Pancakes

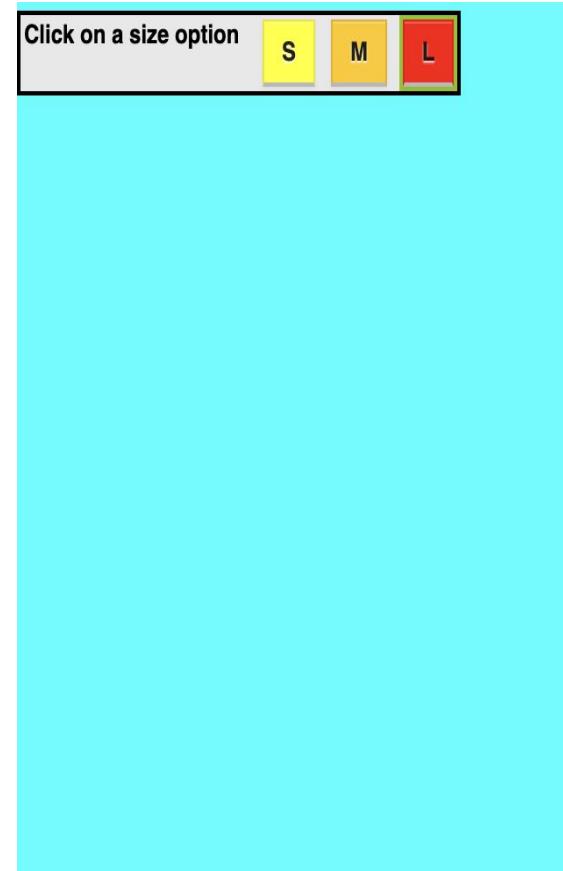
Food Select UI

Select a Size:

Small, Medium, Large

Buttons

(NOTE: The size page is the same layout for all food items)



Order Received UI

Different choices with different order number

Chicken Rice



Laksa



Pizza



Pancakes



MIT App Inventor UI

Order Summary and
Exit Page

Consumer: GopalRoy

Class: P5-2

Roll No. : 10

Thank you! Please logout and enjoy your meal!

Logout

MIT app inventor code

Login:



MIT app inventor code

Choosing
Food:

```
when Button_ChickenRice .Click
do open another screen screenName ChickenRice_Size

when Button_Laksa .Click
do open another screen screenName Laksa_Size

when Button_Pizza .Click
do open another screen screenName Pizza_Size

when Button_Pancakes .Click
do open another screen screenName Pancakes_Size
```

MIT app inventor code

Choose Size:

```
when Small .Click
do open another screen screenName ChickenRiceTab
```

```
when Medium .Click
do open another screen screenName ChickenRiceTab
```

```
when Large .Click
do open another screen screenName ChickenRiceTab
```

```
when Small .Click
do open another screen screenName PizzaTab
```

```
when Medium .Click
do open another screen screenName PizzaTab
```

```
when Large .Click
do open another screen screenName PizzaTab
```

```
when Small .Click
do open another screen screenName LaksaTab
```

```
when Medium .Click
do open another screen screenName LaksaTab
```

```
when Large .Click
do open another screen screenName LaksaTab
```

```
when Small .Click
do open another screen screenName PancakesTab
```

```
when Medium .Click
do open another screen screenName PancakesTab
```

```
when Large .Click
do open another screen screenName PancakesTab
```

MIT app inventor code

Logout Page

```
when Button1 .Click
do open another screen screenName Screen1
```

Micro:bit Code: Food Weight Monitoring

```
on start:
  radio set group [201]
  show icon [radio icon v]
  radio send string [Start weighing ...]
  set scale pins
    SCK [P1]
    DT [P2]
  read scale with zero load
  clear screen
  set flag to [0]
  set food_wt to [1]
  set plate_wt to [124]
  set leftover_wt to [0.05]
  set weight to [read scale in grams]
  radio send string [join "Starting Weight: " weight]
```

```
forever:
  set weight to [read scale in grams]
  show number [weight]
  set difference_wt to [weight - plate_wt]
  if [difference_wt <= 0.1 and leftover_wt <= food_wt + 0.1] then
    if [flag = 0] then
      radio send string [Sees you are done.]
    if [absolute of [leftover_wt + food_wt] <= 0.1] then
      show icon [smiley face icon v]
      radio send string [Congrats! ACED it.]
      radio send string [Leftovers->Composite]
      radio send string [You get points.]
      set flag to [0]
      set food_wt to [1]
      set leftover_wt to [0.05]
    else
      show icon [frowny face icon v]
      radio send string [Finish food pls.]
      radio send string [waste in composite.]
      radio send string [You loose points.]
      set leftover_wt to [0.05]
      set flag to [0]
      set food_wt to [1]
    end
  end
  if [flag = 0] then
    play sound [giggle v] until done
    set flag to [1]
  set weight to [read scale in grams]
  set food_wt to [weight - plate_wt]
  radio send string [join "Yum! Food Wt: " food_wt]
  set leftover_wt to [weight - plate_wt]
```

```
on button A pressed:
  clear screen
  reset
```

Micro:bit Code: Micro:Bit to Telegram

The image shows a Scratch script consisting of two main sections: "on start" and "on radio received".

on start:

- radio set group [201]
- set [receivedString v] to [Hi!]
- initialize ESP8266: Tx [P8] Rx [P12] Baudrate [115200]
- connect to WiFi: SSID ["GopalPhone"] Password ["G190812b"]
- send message to Telegram: API Key ["6299881655:AAEwjZwdmATj5gqW7c4b-BcsSbcv2l3Bn6g"] Chat ID [-974862611] Message [receivedString]

on radio received [receivedString]:

- send message to Telegram: API Key ["6299881655:AAEwjZwdmATj5gqW7c4b-BcsSbcv2l3Bn6g"] Chat ID [-974862611] Message [receivedString]
- show string [receivedString]

Picture of our prototype



Reusable Plastic Food Mat so that users will not dirty the weighing mat while eating. Students can design their own Food Mat.

Future Work (Area of Improvements)

- Use an AI camera to detect the nature of leftover food and advise student accordingly.
- Vendor app where they receive an order, backed by a database which stores all order related transactions. The vendor can view daily orders and different order statistics using the app.

New things/skills we have learnt

1. Prevent food wastage
2. Mit app inventor
3. How to make a piezo electric circuit with piezo electric disks and diodes for recharging
4. Bluetooth
5. ESP8266 Wifi micro:bit library
6. Make a Telegram Bot
7. Connect Micro:bit to Telegram Bot

Thank you for listening to our presentation

Thank You

