



LocalHost  
Services Inc.

Company 12

# Overview

-  Introduction
-  Technical Case
-  Business Case
-  Risk Analysis
-  Closing Remarks



# Introduction

# Team Introduction

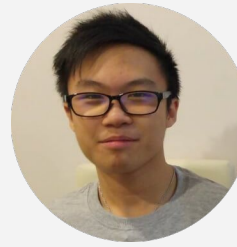
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Angus Kan

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CEO  
Backend and frontend development



Rico Chao

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CFO  
Frontend Development and UI design



Patrick Cong

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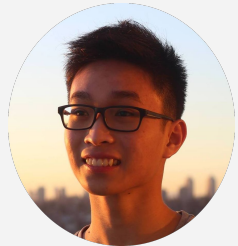
Developer  
Backend development and UI design



Irene Leung

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Developer  
Backend development and UI design



Yoel Yonata

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CTO  
System Integration, Backend and Frontend



Kevin Cao

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CCO  
Backend development

# Our Purpose

Providing real-time status of the table

- Owners
  - Increase profitability by increasing table turnover rates
- Waiters
  - Improve efficiency and reduce stress
- Customers
  - Optimize dining experience



# Problems

Many restaurant owners are struggling with the following problems

- For growing restaurants, they will inevitably run into the issue of long wait times for seating customers, due to a growing customer base
- Most of us have experienced waiting to be seated even though we see unoccupied dirty tables
- Along with the staff shortages due to covid, servers are under more stress than usual, restaurant owners are seeking for a solution to help their business run more efficiently

Local restaurants struggle with staffing, leading to reduced hours and longer wait times for diners

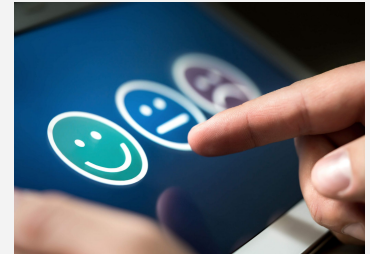
RACHEL JACOB NEWS-TIMES Jul 11, 2022 Updated Jul 11, 2022 0



# Our Solution

LocalHost restaurant management system helps restaurants better organize their table service by monitoring the status of the tables

- Intuitive visual representation
- Reduce the stress on staff
- Increase restaurant efficiency in table turnover rate, in turn increasing profits
- Improve customer satisfaction
- Reduce multiple trips made to check in on tables



# Motivation

## Market Research

- Talked to and collected questionnaires from
  - Restaurant owners
  - Restaurant workers
  - Customers

## Personal Experience

- Waiting to be seated at restaurant
  - Waiters don't notice dirty unoccupied tables until they need to seat new customers
- Tables situated in corners that are hidden
  - Hard to get waiters' attention
- Stories from waiters
  - Stressful to check on all the tables during busy hours



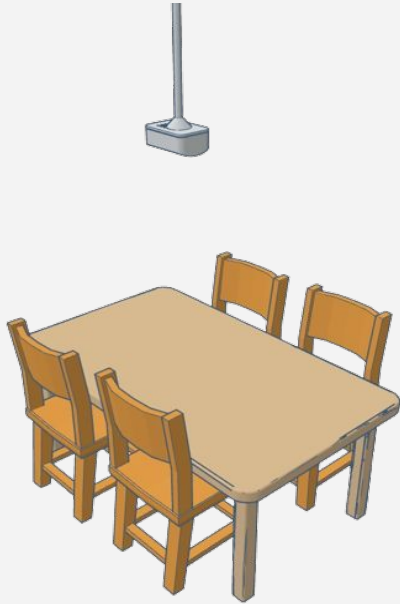




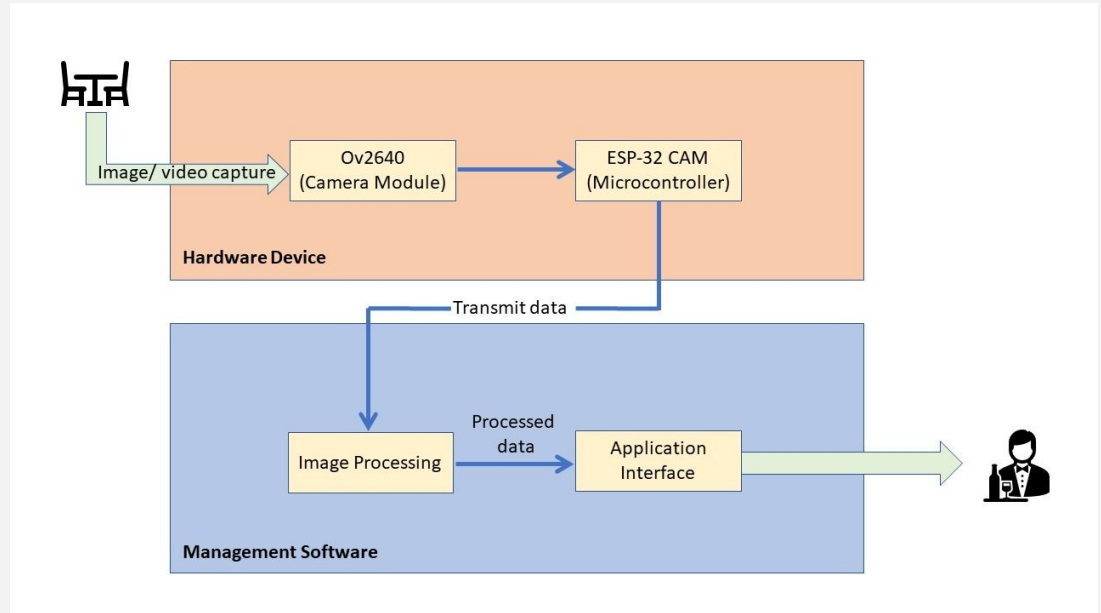
## Technical Case

# System Level Design

Hardware camera module + Management software



Product Setup

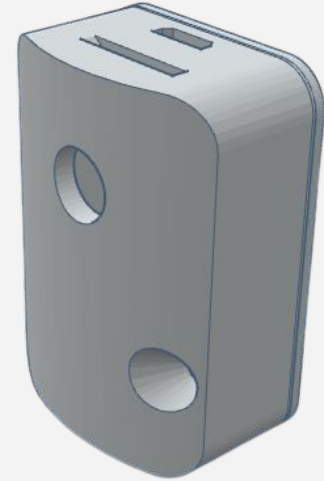


System Overview

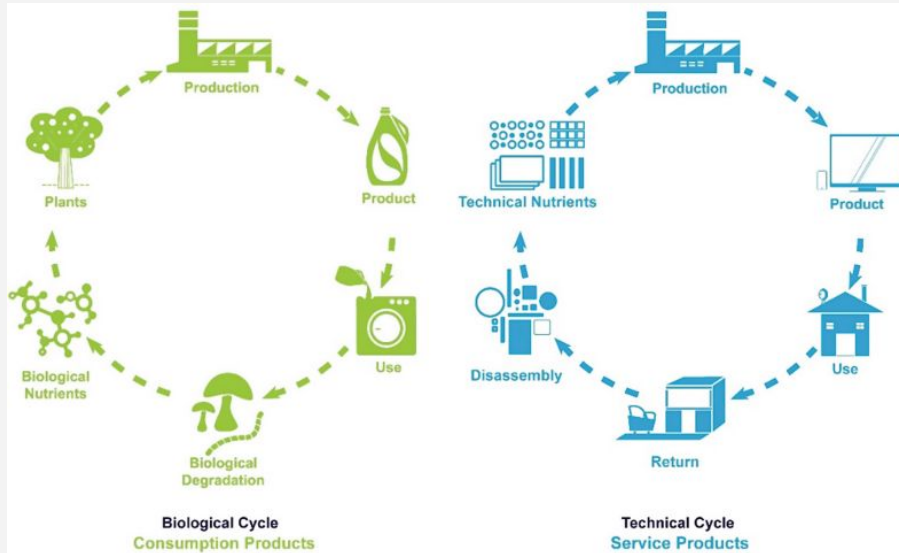
# Hardware Outlines

## Camera module

- Hanging above the tables from the ceiling
- ESP32CAM Micro-controller
  - Build-in camera with Wifi and Bluetooth modules
  - Light weight
  - Energy efficient (160 - 260 mA power consumption)
  - Great heat dissipation
  - Can be installed along with lights



# Cradle to Cradle



PLA for 3D printed case, enclosing the camera module

- PLA filament is made from plant-based materials derived from crops.
- This makes PLA recyclable and biodegradable.
- Other components such as wires and PCB board for the camera module can be recycled as well.

# Safety



## **Material Safety:**

Dangerous chemicals can be released when traditional plastics are incinerated, but not PLA.

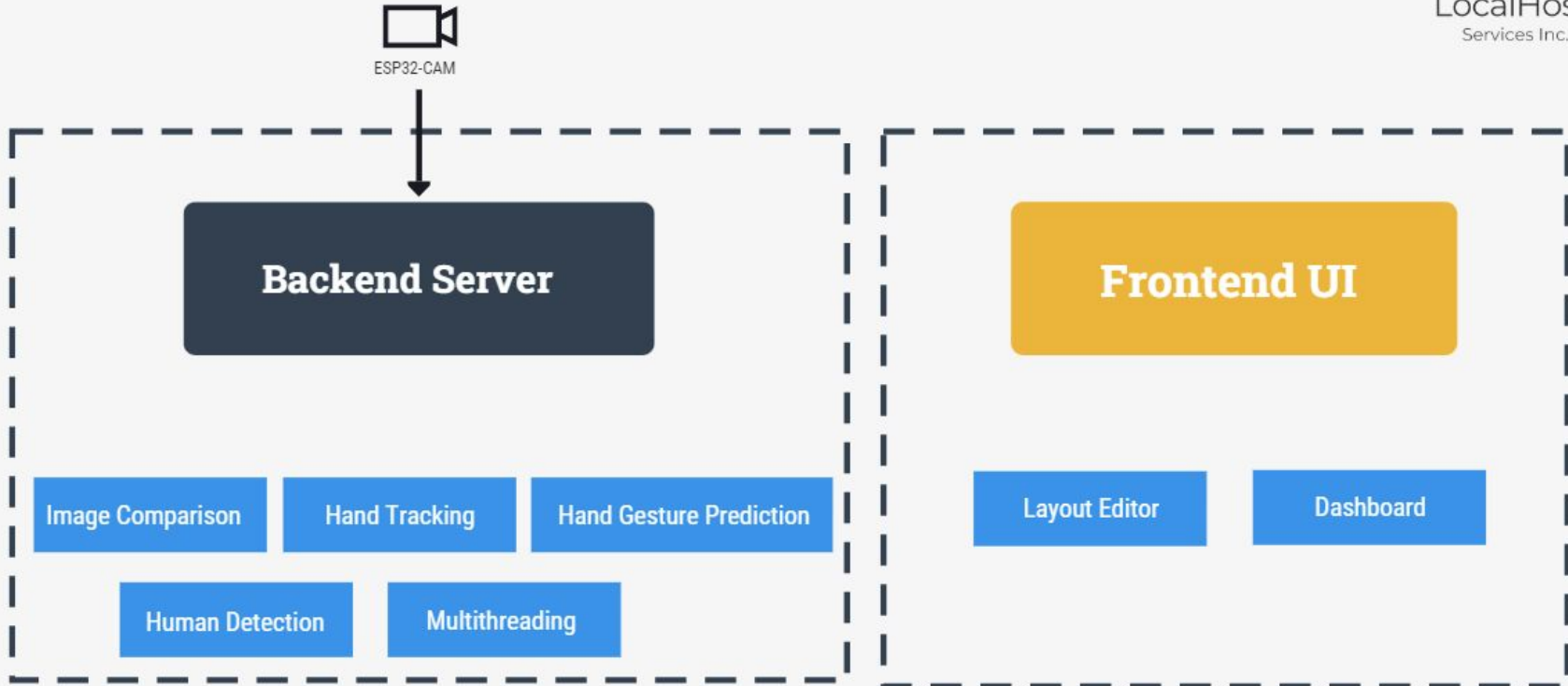
This means our hardware device can be installed near dining lights.

## **Component Safety:**

Having the device installed hanging on the ceiling means having a risk of falling.

The device has to be securely installed, to mitigate the risk of falling.

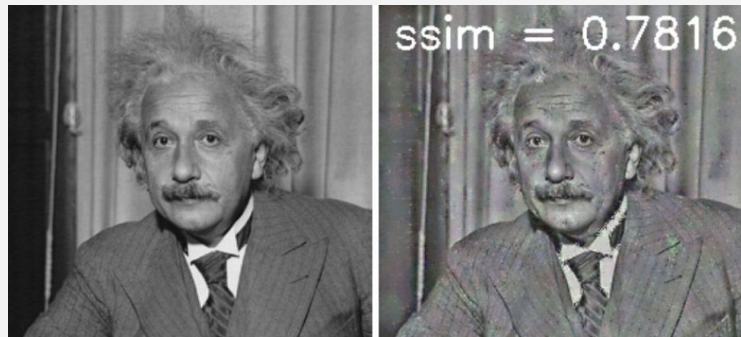
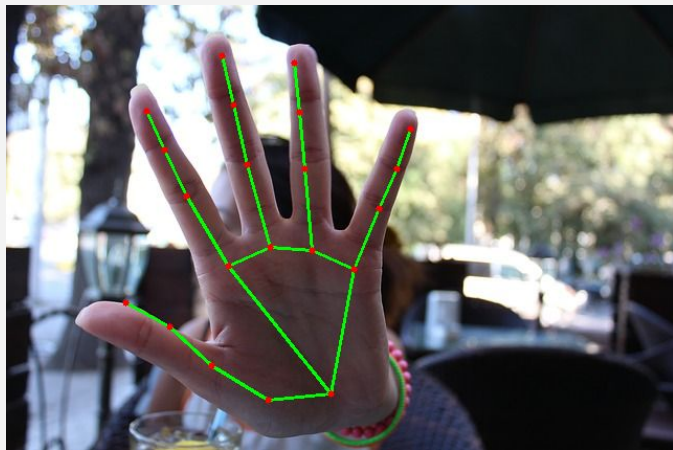
# Software Outline



# Software Outline

## Backend Server

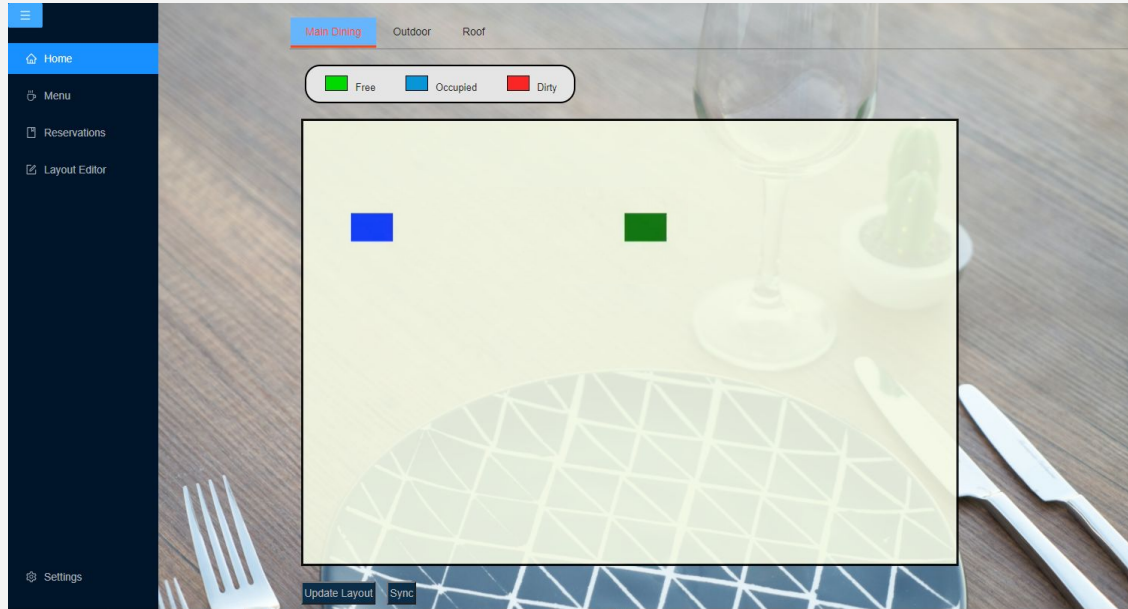
- Human Detection (OpenCV)
- Image Comparison (Skimage)
- Hand Tracking (Media Pipe)
- Hand Gesture Detection Model (Keras)
- Multithreading for multiple cameras



# Software Outline

## Frontend UI

- Fully automated table status recognition
- Customizable restaurant table layout
- Intuitive visual representation
- Responsive





# Estimated

## Planning:

- Prototype Refinement

## Hardware:

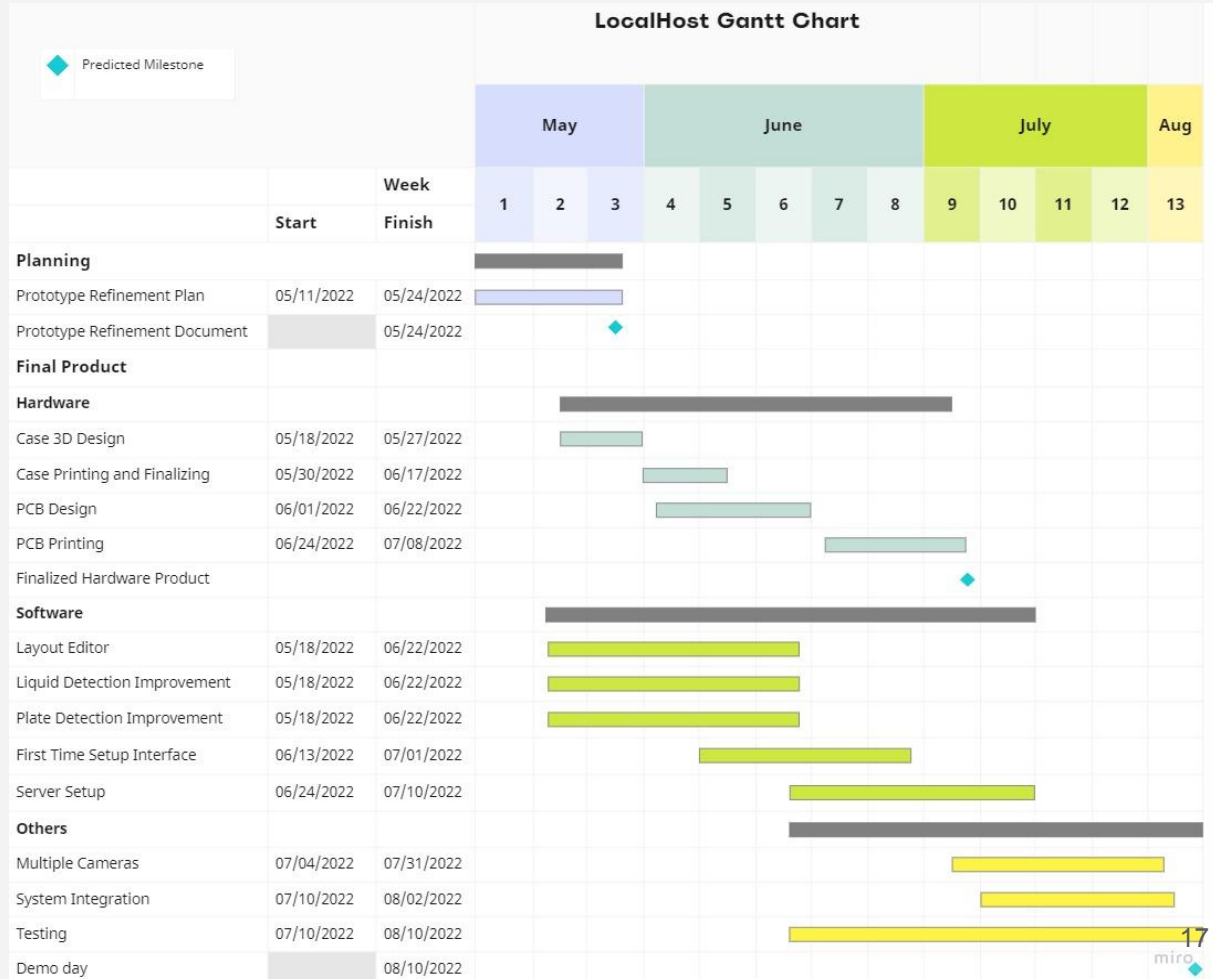
- Case 3D Design
- Print and Finalize
- Making PCB

## Software:

- Layout Editor
- Improving Liquid Detection
- Improving Plate Detection
- First Time Setup Interface
- Cloud Server Setup

## Others:

- Multiple Cameras
- Integration and Testing



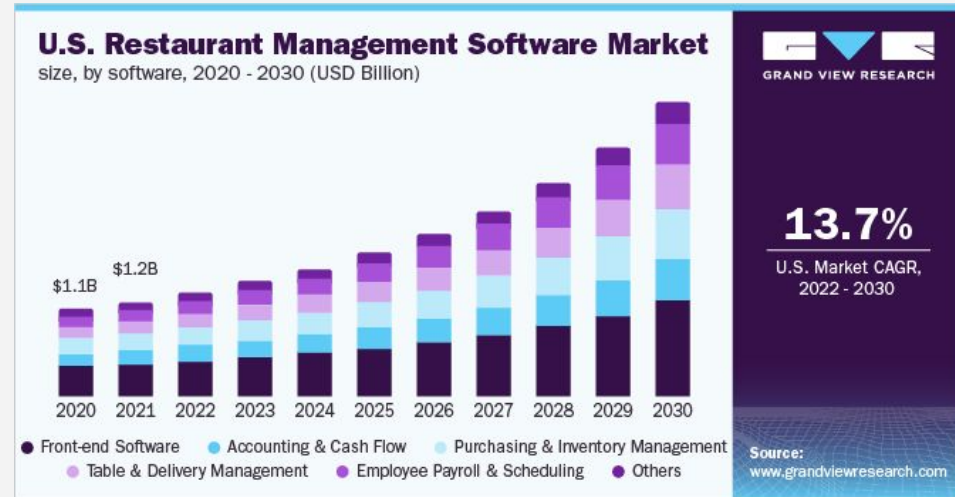




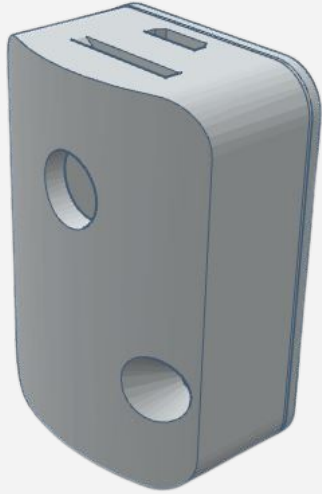
# Business Case

# Market Analysis

- Target Market:
  - All types of indoor restaurants within North America
- Market Size:
  - Global restaurant management software market size: 4.08 billion USD [2]
  - Expected to grow at staggering 15.8% annually
  - LocalHost's product focuses on the table management sector



# Price



\$50 CAD/ Unit

+



Monthly Subscription of \$200/month

# Budget

## Fixed Costs

Expenses	Cost
Payroll	\$12,832
Marketing	\$300
Rent	\$1,250
Misc	\$100
Subtotal	\$14,482

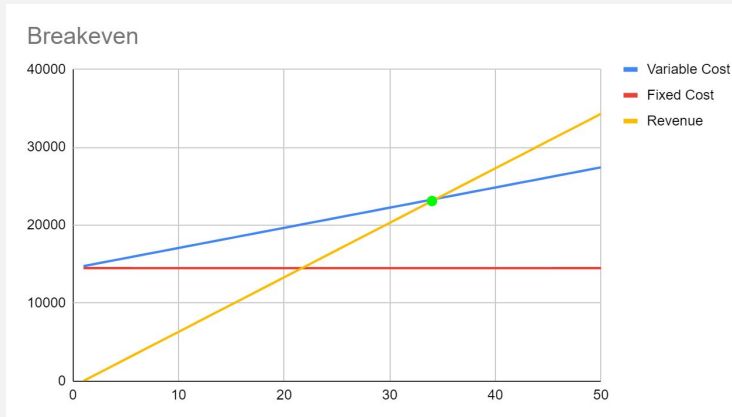
## Variable Costs

Components	Cost
ESP32-Cam Module	\$15.52
5V 1A Power Adapter	\$7.95
3D-Printed Case	\$2.42
Subtotal	\$25.89

## Breakeven point

Predicting that restaurants buy around 10 camera modules  
As well as factoring in our \$200/month subscription cost

$$\begin{aligned} \text{Restaurants} &= \text{Fixed Cost} / ((\text{Price per restaurant} - \text{Variable Cost}) + \text{monthly subscription}) \\ \text{Restaurants} &= 14482 / ((500 - 258.9) + 200) \\ \text{Restaurants} &= 32.83 \end{aligned}$$



Breakeven:  
33 restaurants  
Without accounting  
for recurring  
monthly  
subscriptions

# Competitors

Cake



- Point of Sale
- Guest Manager
- Online ordering
- Reporting

Waiterio



- Point of Sale
- Website Builder
- Online ordering
- Menu with QR code

Eatapp



- Point of Sale
- Manual Table Management
- Customer relationship management
- Analytics

# Financing

- The Wighton Engineering Development Fund
  - Covers the cost for multiple cameras, 3D printed cases
- Angel Investors
- Small business loans from banks





# Targeted Customers

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Restaurants which

- want to increase table turnover rate
- have large customer bases but not planning to expand
- have trouble managing large amount of tables
- have staff shortage
- want to improve their customer's dining experience

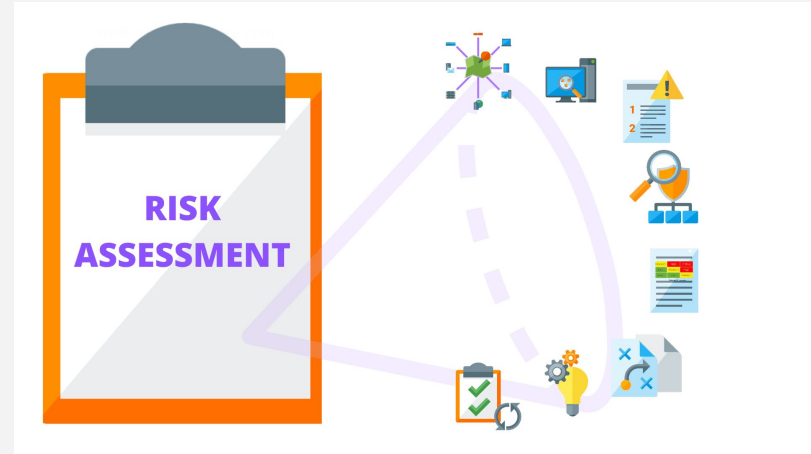




# Risk Analysis

# Potential Risks

- Customer's comfort level
  - Customers may think that having a camera above them is intrusive
- Power supply
  - Constant stream of video may require a lot of power and restaurants have to be open for long hours
- Customer might have concerns about data security
  - Data leak, data misused



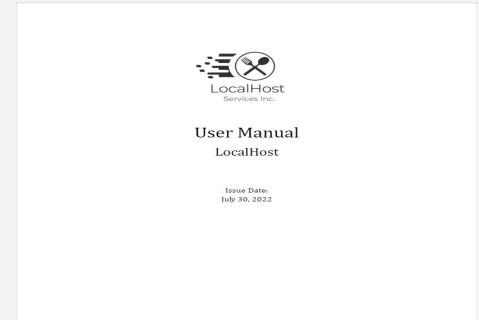
# Mitigation of Risks and Plan B

- Customer's comfort level
  - (Hardware installation position)The camera modules are installed above the tables, less noticeable
- Power supply
  - (Plugged in instead of using batteries)
- Data security
  - Not storing any data in any form anywhere



# Engineering Standards

- CAN/CSA-C22.2 NO. 60950-1-07 (R2021) (Information Technology Equipment — Safety — Part 1: General Requirements (Bi-National standard, with UL 60950-1))
  - Capture video streams and pictures will not be disclosed and used for other purpose
- ISO 21600:2019 (Technical product documentation (TPD)— General requirements of mechanical product digital manuals)
  - Have a well written user manual available for the customers
- ISO/TC 122/SC 4 (Packaging and the environment)
  - Use recycled materials like recycled cardboard to package our product





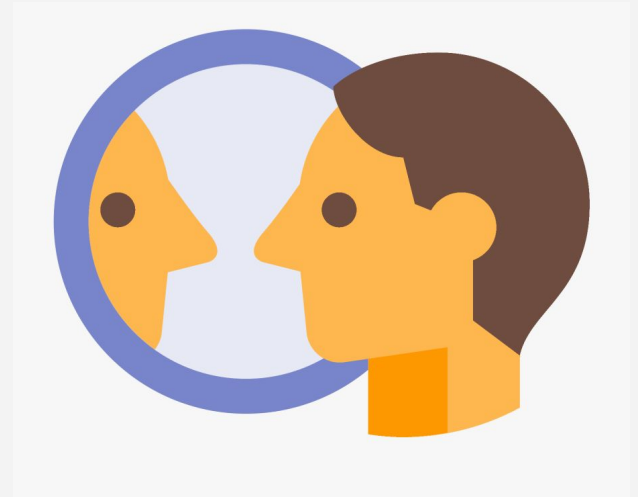
## Closing Remarks

# Self Reflection

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## What did we learn?

- Technical: Frontend & Backend Development, CAD Design, image processing frameworks, detection libraries, Hardware & Software System Integration
- The importance of having clear end vision before development
- Customers' requirements are our first priority
- Importance of time management
- Learn when to give up an idea



# Self Reflection

## What would we do differently?

- Do not worry too much about the cost for project
- Have better teamwork and communication
- Have internal team deadlines before course deadlines





# Conclusion

## **Our System:**

- Unique features on the market
- Simple and intuitive, to provide a good user experience
- Environmental materials
- For both hardware and software components, our company has prepared different plans when we encounter risks that are difficult to handle.
- Continuous system update and excellent customer support

# References and Acknowledgements

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[1] "The Pros and cons of polylactic acid (PLA) bioplastic, the 'Corn Plastics,'" *BioMass Packaging | Sustainable Foodservice Packaging*, 20-Dec-2017. [Online]. Available:

<http://www.biomasspackaging.com/the-pros-and-cons-of-polylactic-acid-pla-bioplastic-the-corn-plastics/>. [Accessed: 05-Aug-2022].

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## Acknowledgments:

- Dr. Andrew Rawicz and Prof. Mike Hegedus
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# Questions?

Thank you very much for listening!