Robotic Food Delivery

Product Strategy

Product Manager: Shanish

Background

Problem

One of the food delivery restaurant chain in Singapore is facing high operational cost and unreliable food delivery due to multiple factors like unavailability of manpower, high traffic. Company is looking self-driven autonomous food delivery across Singapore to address the issues .Initially company is looking delivery within 2 miles and once robots are stabilized with autonomous delivery , company will widen its operations across the island

Background

- Develop navigation system to control self driven food delivery Robots
  - Check the status of delivery
  - Remotely control the Robots that need intervention
- We target to develop fully automated food delivery system across SG

FoodByRobo

Business Case

Initial Focus

Where are we starting?

- Company targets fully automated Island wide food delivery
    - Reduce operational cost and
    - Provide more reliable delivery times

    - Initial focus on delivering food by self driven robot with in 2 miles
    - Train the robot to deliver the food with minimal human intervention
    - Targeting island wide delivery
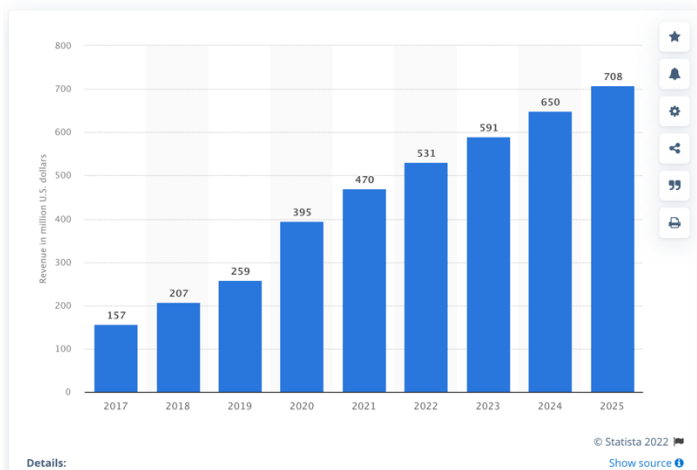
Opportunity

What's the problem?

- Increase in the operational cost

- Inconsistency in delivery time

- High competency with physical food delivery

Opportunity

Current market trend

Revenue of online food delivery Singapore from 2017 to 2025
(in million U.S. dollars)

© Statista 2022

Details: Show source ⓘ

https://www.statista.com/forecasts/1183536/revenue-online-food-delivery-singapore#:~:text=In%20Singapore%2C%20the%20revenue%20generated,approximately%20708%20million%20U.S.%20dollars.

- As per the analysis , the trend shows the revenue for online food delivery shoot by 3 times in last 4 years

- Expected there will be potential growth for next 4 years

- Due to COVID there is high demand for online food delivery

- Change in consumer habit

- Home office

- Increase in Demand for comfort

- Unavailability of time

Opportunity

*"According to the study, which is based on data from 500 survey respondents in Singapore, **53 percent said that they have started using food ordering apps more frequently in the last two years"***

Singapore Population clock (live)

6,074,613	**Current population**
3,062,204	Current male population (50.4%)
3,012,409	Current female population (49.6%)

Total : ~ 6 m

Opportunity

TAM - Assumptions

- Considered implement in Singapore
  - Divided Singapore into 34 areas
  - Took one region for initial roll out and considered average population
    - https://www.citypopulation.de/en/singapore/cities/

Opportunity

TAM - Assumptions

- As per studies ~50% of the population opt for online food delivery

- Considered 5% of the population opt for Robotic food delivery in the first year

- On an average 1 family will have 3 members

- Expected minimum 1 order per family in one day

- Fixed delivery rate 3(varies depends on the restaurant location)

Opportunity

TAM - Assumptions

- Considering 14 Robot in one region
    - Average area is 21Sq KM
    - One Robot serve 1.5 Sq KM

Opportunity

TAM

Population	Population(online food ordering)	Expected % of consumer	Expected Number of consumers	Number of orders per day	Rate per order (USD)	Earning per day(USD)	Earning in year(USD)
180000	90000	5%	4500	1500	3	4500	1642500

Opportunity

What we need to do

- Identify unique way of food delivery that solve the potential problem

Proposal

What's Our Solution?

- Build autonomous robot food delivery
  - Minimal manual intervention
  - Reduce the operational cost
  - On time delivery
  - Inline with consumer habit
- Initial phase has food delivery within 2 miles
- Long term plan to have island wide delivery by Robot
  - Assign team in initial phase to navigate Robot
  - Train Robot till they fully autonomous

Return On Investment

Current cost

- Current Delivery cost in an average USD 7

- Restaurant commission – 30% to 35%

- Cost with Robotic solution

  - Delivery cost to consumers – USD 3

Return On Investment

What can we do?

- Reduce the food delivery cost to consumers to 50%
  - Increase the number of consumers
    - Expecting 70%-80% increment
  - Increase in the number of restaurants joining the
    - Reduce restaurant commission (current 30%)
    - Expecting 70%-80% restaurants use the service

Return On Investment

Expected Earning

1st Year

Population	Population(online food ordering)	Expected % of consumer	Expected Number of consumers	Number of orders per day	Rate per order (USD)	Earning per day(USD)	Earning in year(USD)
180000	90000	5%	4500	1500	3	4500	1642500

2nd Year

Population	Population(online food ordering)	Expected % of consumer	Expected Number of consumers	Number of orders per day	Rate per order (USD)	Earning per day(USD)	Earning in year(USD)
180000	90000	8%	7200	2400	3	7200	2628000

3rd Year

Population	Population(online food ordering)	Expected % of consumer	Expected Number of consumers	Number of orders per day	Rate per order (USD)	Earning per day(USD)	Earning in year(USD)
180000	90000	10%	9000	3000	3	9000	3285000

Return On Investment

Expected Cost

1st Year

| Number of robots (USD)	Cost per robot (USD)	Total cost (USD)	Annual maintenance per robot(USD)	Total maintenance (USD)	Development cost (USD)	Advertisement (USD)	Total cost (USD)
14	10000	140000	10000	140000	1000000	50000	1330000

2nd Year

Number of robots (USD)	Cost per robot (USD)	Total cost (USD)	Annual maintenance per robot(USD)	Total maintenance (USD)	Development cost (USD)	Advertisement (USD)	Total cost (USD)
14	10000		10000	140000	400000	50000	590000

3rd Year

Number of robots (USD)	Cost per robot (USD)	Total cost (USD)	Annual maintenance per robot(USD)	Total maintenance (USD)	Development cost (USD)	Advertisement (USD)	Total cost (USD)
14	10000		10000	140000	400000	50000	590000

Return On Investment

Single Region

Single Region ROI (%)

Year	ROI
2022	0.24
2023	3.46
2024	4.57
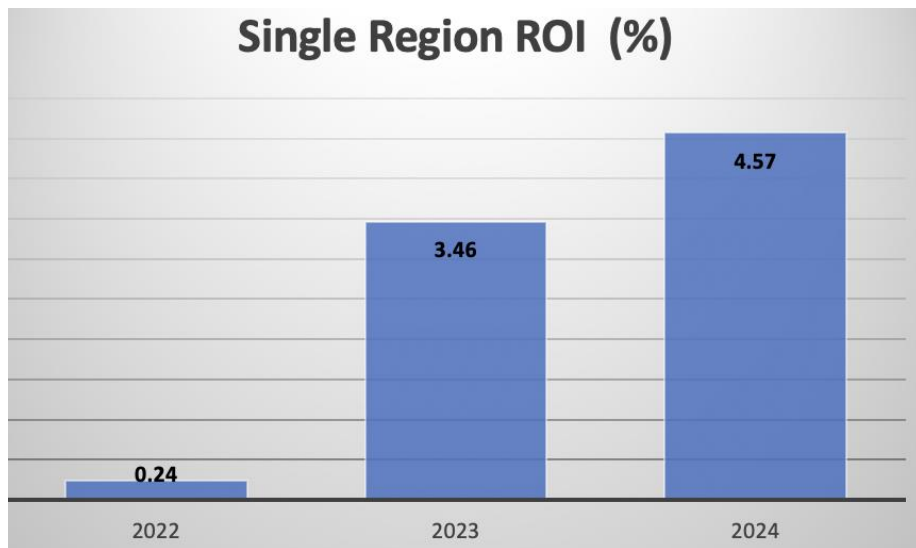
Return On Investment

Island wide
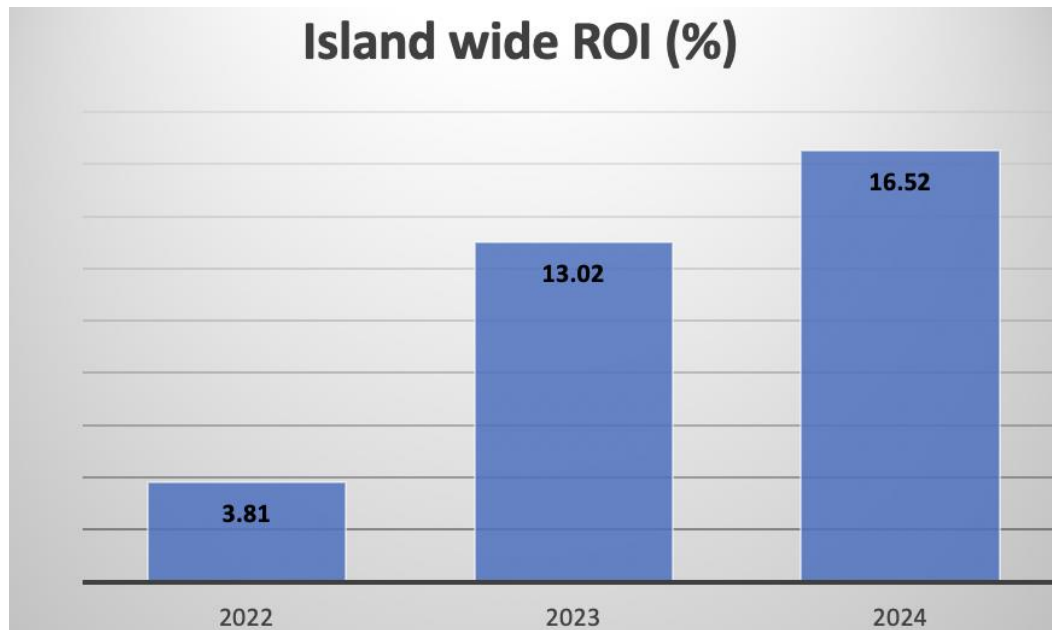
Measurement

How will we know if we're successful?

- Target on on 0.25% on ROI in the first year in single region
    - Payback with profit in 1st year
- 100% on time delivery
- 8 % increase in the consumer

Competitors

[Competitor 1]

GrabFood Autonomous Mobility Robot

- Popular in food delivery and travel
- Island wide food delivery
- Capable of consolidating and delivering 350 orders in 15 min
- Hygiene and Fresh
- Not full fledged in Singapore
- Partner with *Techmetics Robotics*
- Total revenue in 2021: USD 157m (-9% drop compared to 2020)

https://www.grab.com/sg/press/others/grab-reports-third-quarter-2021-results/#:~:text=GMV%20for%20deliveries%20grew%2063.improved%20by%20%241%20million%20YoY

[Competitor 2]

Foodpanda

- Popular in food delivery and travel
- Island wide food delivery
- Initial stage and focused with in limited area
- Secured with order proof and OTP
- Partner with OTSAW
- Revenue jumped to 62% in 2021 Q4 , total revenue USD 997.8 m

https://www.techinasia.com/foodpanda-posts-62-yoy-revenue-jump-delivery-hero-losses-swell

Our Advantages

Why are we better?

- We target door to door food delivery
  - Consumers not needed to gather at one point
- We target island wide food delivery , targeting all the places
- Consumer can communicate to Robot directly , voice call facility
- Delivery within 15 min
- More number of Robot in one region
- On demand robotic store based on consumer's request

Roadmap and Vision

Roadmap Pillars
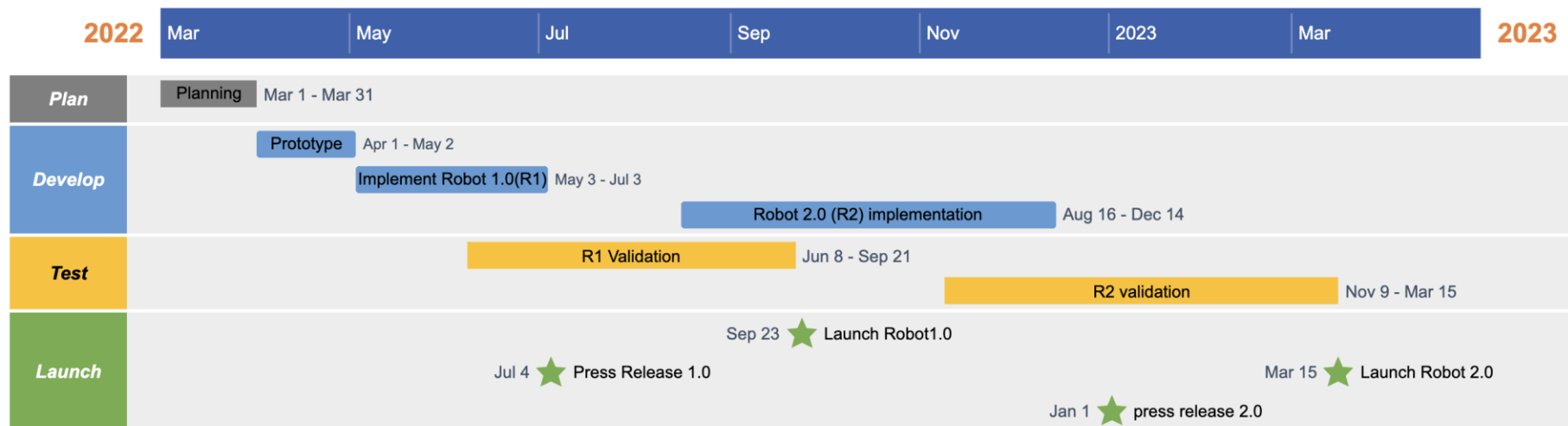
Where do we go from here?

"Relax , We provide food on time"

Our vision is to make our consumer happy by uninterrupted food supply in 15 minutes with less cost

- Short distance food delivery

- Training the robot

- Rollout at Region A

Roadmap Pillars

Where do we go from here?

2022	Mar	May	Jul	Sep	Nov	2023	Mar	2023

Plan
- Planning — Mar 1 - Mar 31

Develop
- Prototype — Apr 1 - May 2
- Implement Robot 1.0(R1) — May 3 - Jul 3
- Robot 2.0 (R2) implementation — Aug 16 - Dec 14

Test
- R1 Validation — Jun 8 - Sep 21
- R2 validation — Nov 9 - Mar 15

Launch
- Sep 23 ★ Launch Robot1.0
- Jul 4 ★ Press Release 1.0
- Mar 15 ★ Launch Robot 2.0
- Jan 1 ★ press release 2.0

R1- Robo with limited manual intervention
R2 - Self driven autonomous robot

Short distance delivery

Robot 1.0

- Implement and rollout short distance robot food delivery
    - Selected store in one region
    - Robot to be grouped based on area with in region
    - Register the destination address into Robot based on order sequence
    - Configure reroute based on objects(Human vs Material)
        - Alarm facility

Human voice recognition

Human interaction facility

- Implement human voice recognition
    - Feasibility of taking action based on voice
    - Easy to operate
- Feature inform consumer on route , current status.
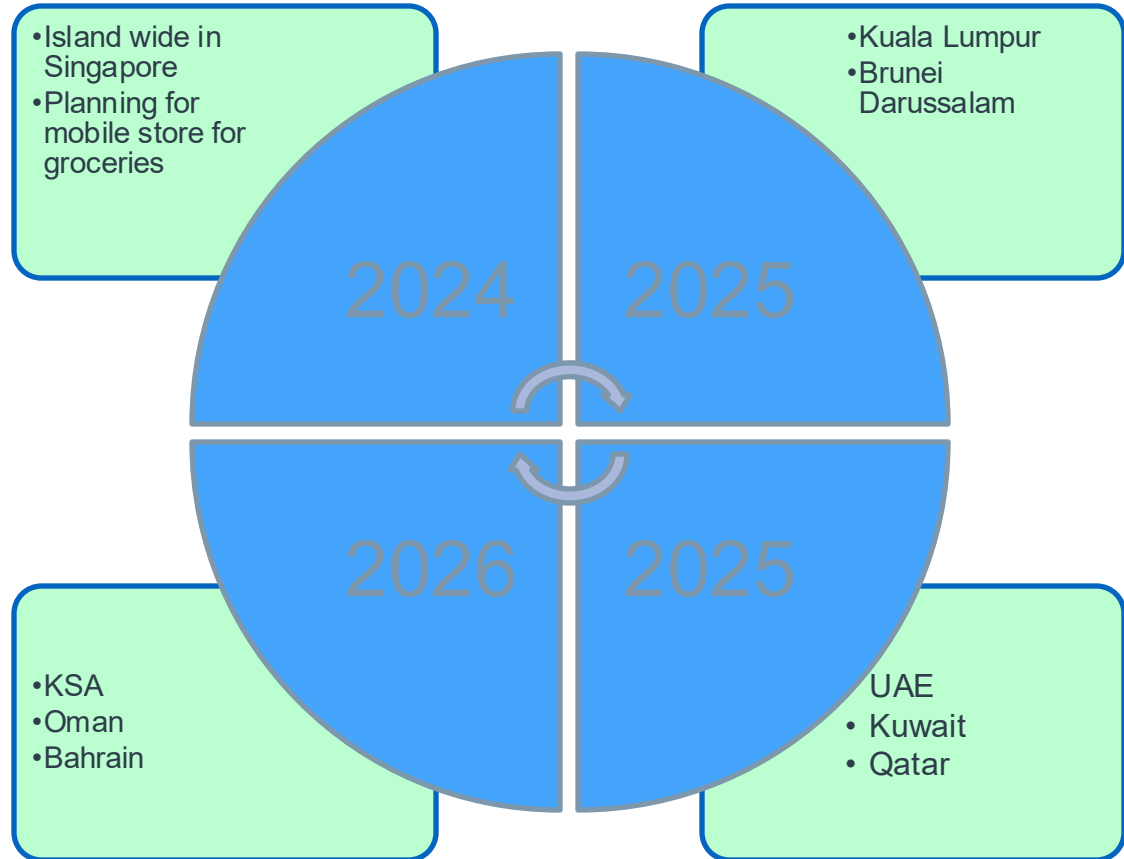- Configure call facility between robot and consumer

Autonomous delivery

Autonomous System- Robot 2.0

- Expand to entire area in a region
- Fully automated navigation system
- Zero human interaction
- Back up call alert

Where do we go from here?

Widening the scope

- Island wide in Singapore
- Planning for mobile store for groceries

2024

- Kuala Lumpur
- Brunei Darussalam

2025

- KSA
- Oman
- Bahrain

2026

2025

UAE
- Kuwait
- Qatar

Q & A