



Greenovators

Gripe with Pigeons in Hawker Centres





Greenovators

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We are a team of driven individuals, with the goal of solving environmental issues using Engineering innovations.

OUR TEAM



Imran Ismet
(Design Engineer/ Team Lead)

Imran specializes in the overall engineering aspects of the product.



Chan Jia Jin
(Research & Development)

Having experiences with science and technology, JJ aids the team with the science and planning of the project.

OUR TEAM



Mok Wei Jie
(Mechanical Engineer)

With mechanical expertise
Wei Jie is in charge of the
mechanism designs.



Ng Theng Kiat
(Production Engineer)

As the production engineer of
the team Theng Kiat overlooks
the production methods used.

OUR TEAM



Clive Lye
(Quality Analysis)

As the Quality Engineer, Clive ensures that the product is produced to its optimal design without any flaws.

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INTRODUCTION

Pigeons are commonly found around Singapore, they are extremely common around the Hawker centres. This is risky as Pigeons carry different diseases with them.



PROBLEM

Hawker centers are often filled with leftover food, as some people do not clean up after themselves and the food waste bins are overfilled.

Due to this there is a window of opportunity for birds to scavenge leftover food.

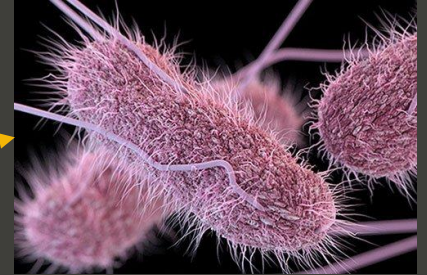


Potential Health Risks

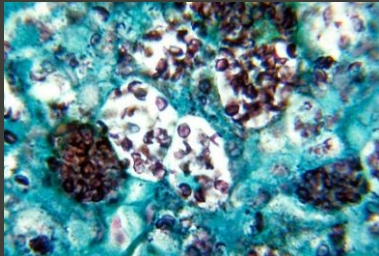
E.Coli



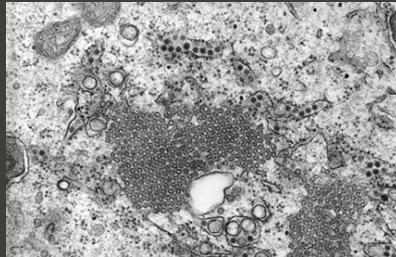
Salmonellosis



Histoplasmosis



St. Louis Encephalitis



Candidiasis

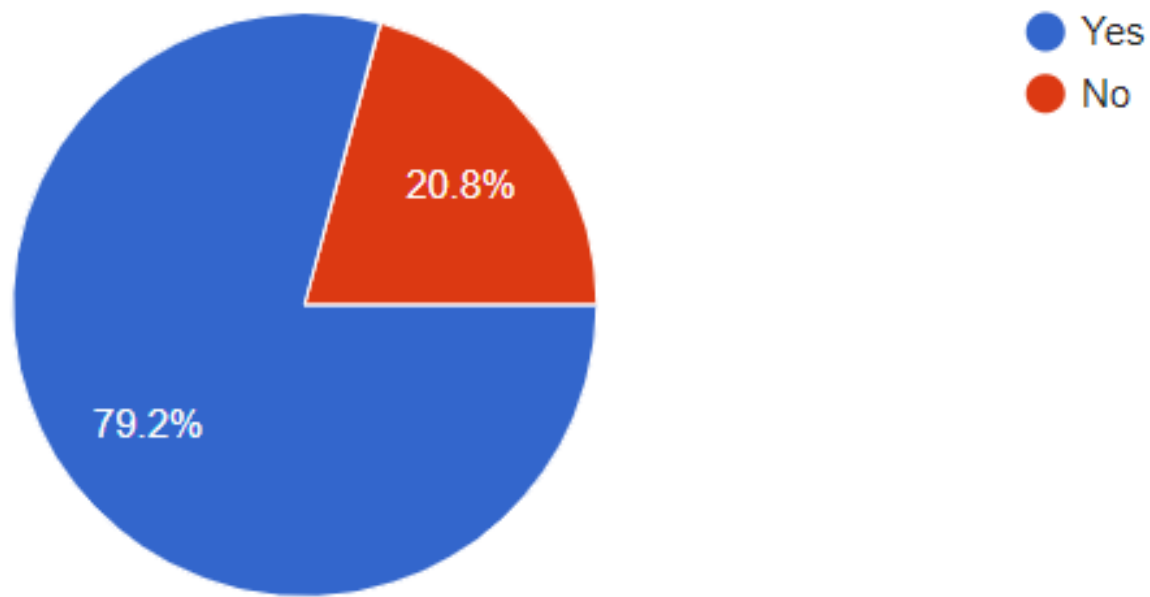


Research Method

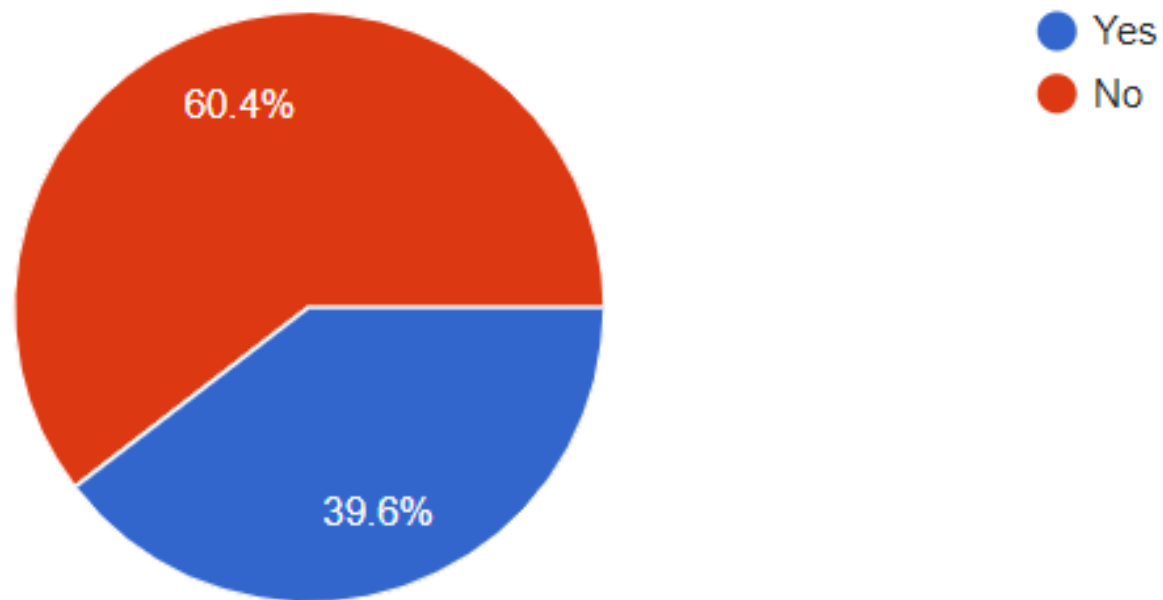


We conducted a survey to ask Singaporeans on their take regarding pigeons increasing in population in Singapore.

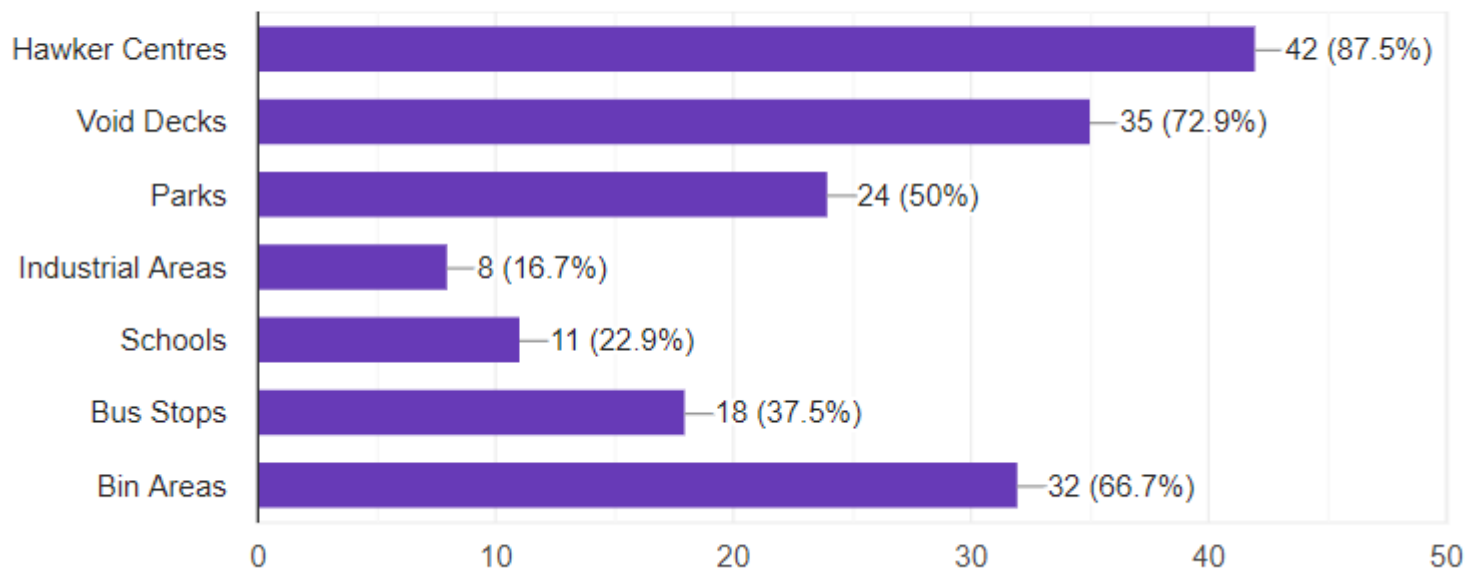
Are you aware of the potential hygiene problems pigeons will bring to us?



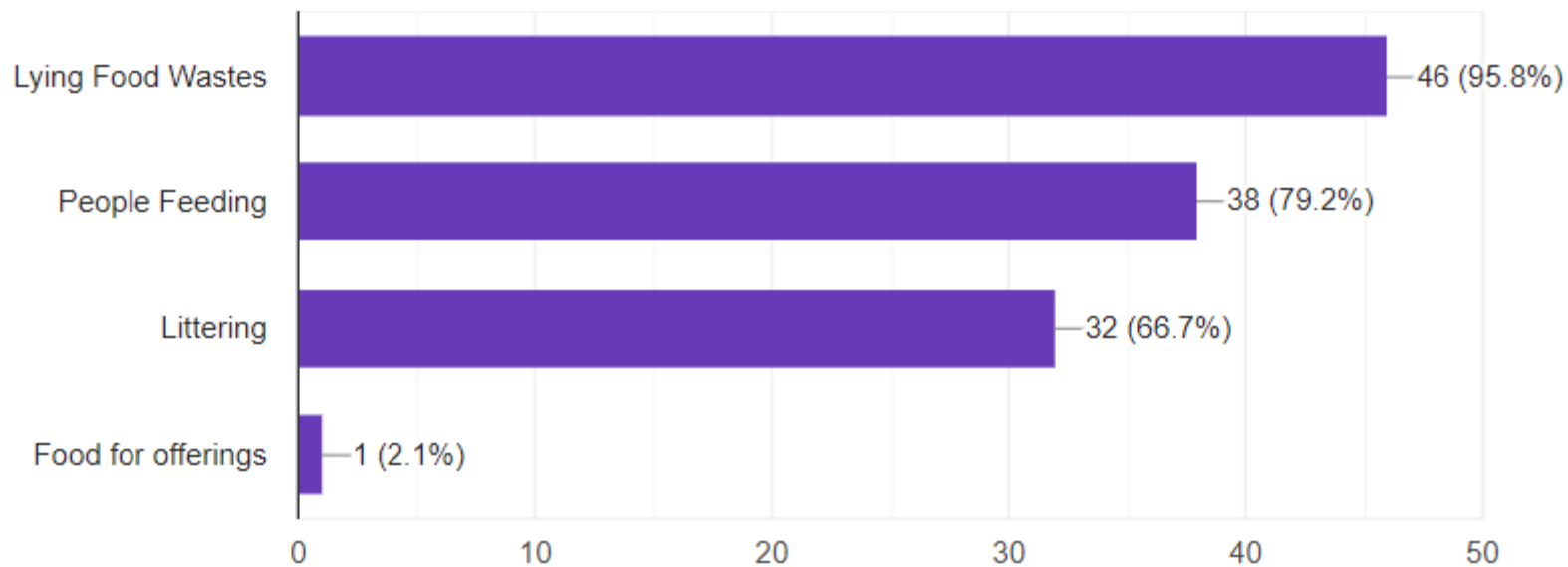
Are you aware of the increase in the population of pigeons in Singapore?



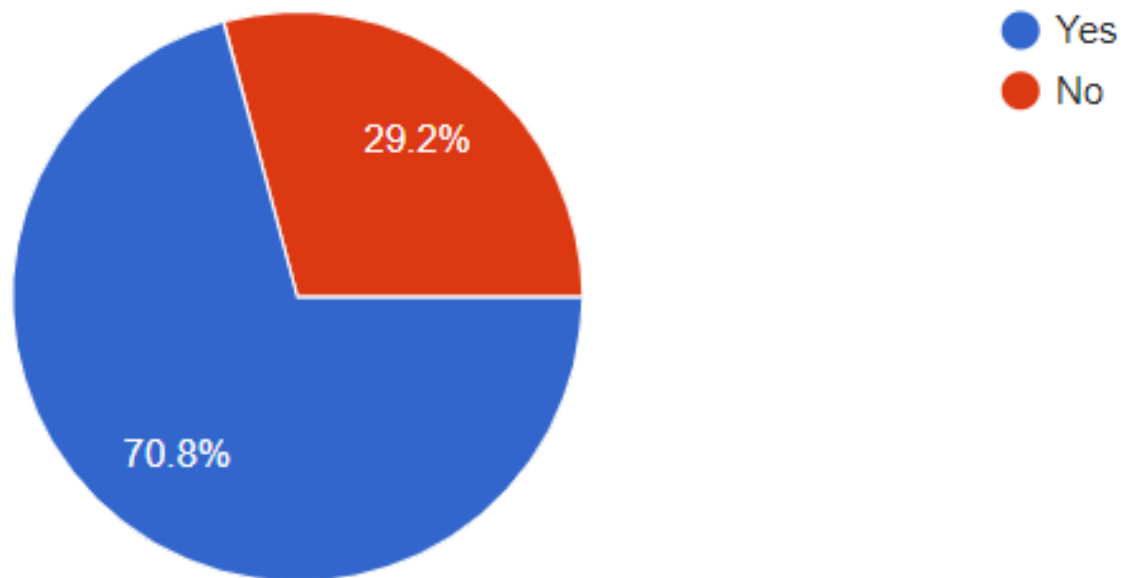
Which of these places do you see pigeons frequently?



Which of these options do you think attracts these pigeons?



Do you feel irritated by pigeons in hawker centers/ coffee shops?



A top-down view of various dried tea leaves and herbs scattered on a light grey surface. Several wooden bowls and scoops are filled with different types of tea: dark green rolled leaves, light green loose leaves, and white tea buds. Some bowls also contain dried red flowers. The background is a soft-focus grey surface.

SOLUTION

To design a product that prevents pigeons from pillaging leftover food.

Inspiration



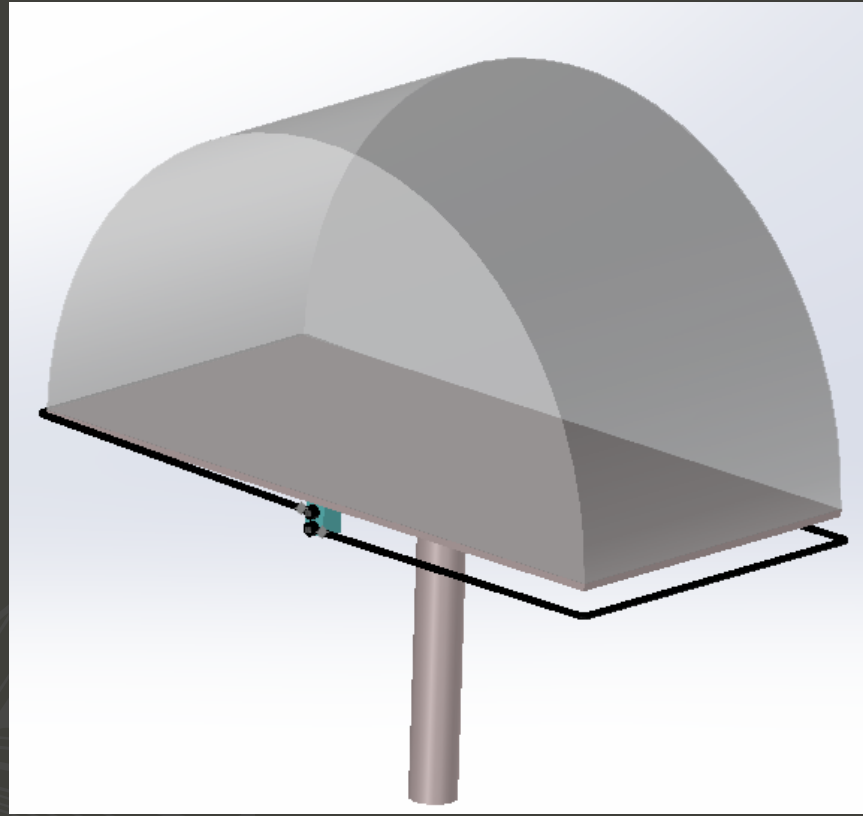
CLOCHE

Wanted to incorporate the idea of using the cloche design to fend off pests in homes

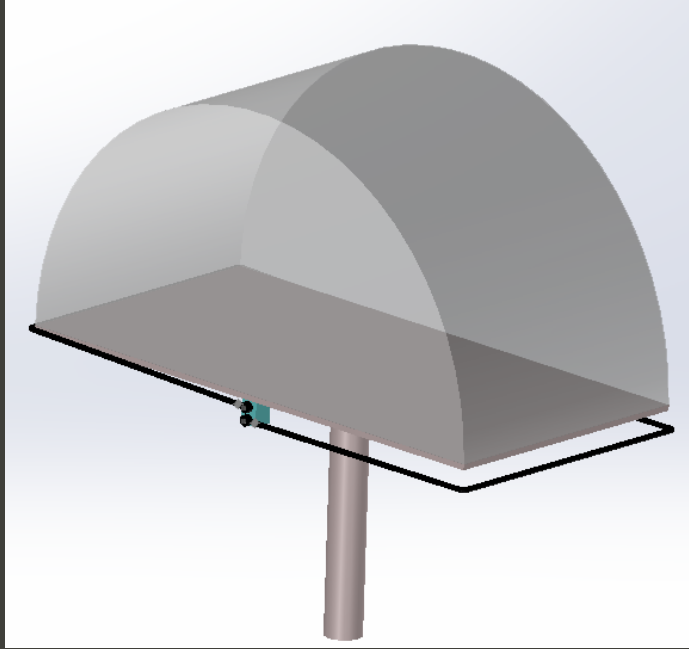
Collapsible TPE Container

Required a product that is easy to utilize

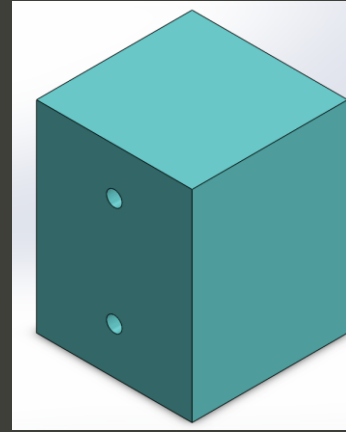




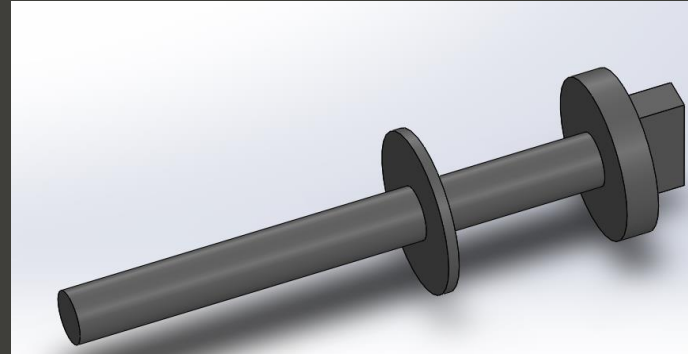
The Pigeonet



Isometric view



Pivot



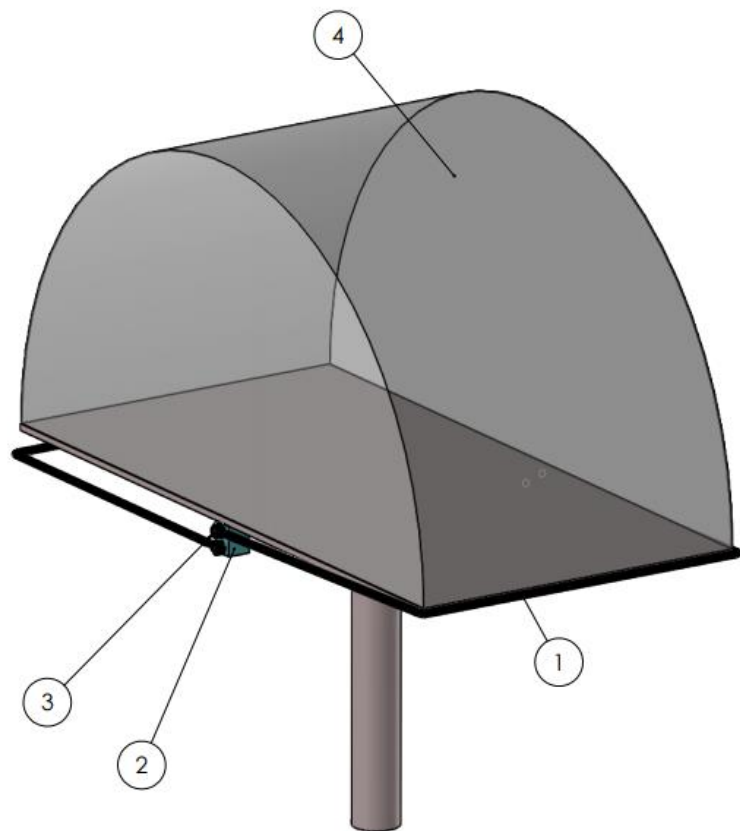
Custom Designed Screw

Product Breakdown

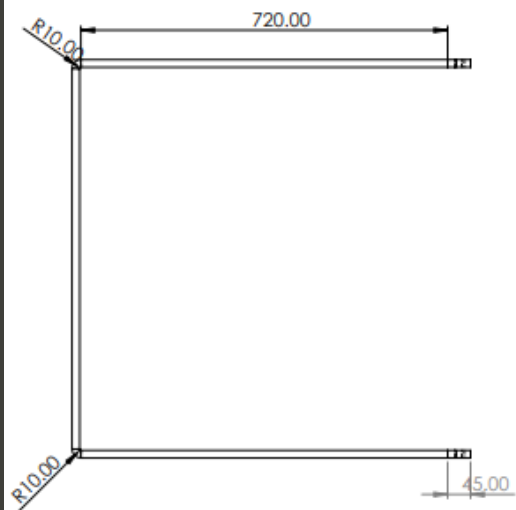
- Product will be fully made of plastic and attached using screws
- Custom-made screws lock cover frames in place to facilitate ease of assembly
- Customized screw is designed to be toolless and manually screwed on and off for the conveniences of the cleaners for their maintenance to remove the frame itself

Product Breakdown

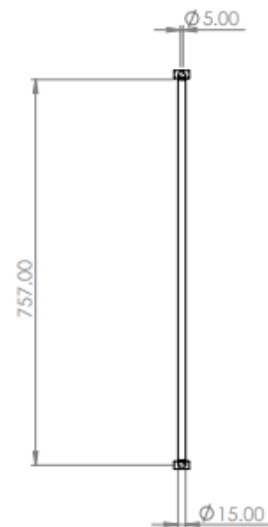
- Table shield (Dome) is made of flexible rubber-like plastic called Thermoplastic Elastomers (TPE)
- Frame and pivot mechanism to be made from harder and more durable plastic called Grade 1 High-Density Polyethylene (HDPE)
- All materials will be certified food grade safe, and will be resistant to chemical weathering and fouling



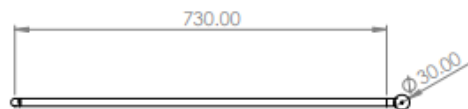
S/N	PART	DIMENSION (mm)	MATERIAL	QUANTITY
1	FRAME	730X757X ϕ 15	HDPE	2
2	MAIN SUPPORT	50X50X65	HDPE	2
3	CUSTOMISED SCREW	58X ϕ 15	HDPE	2
4	COVER SHIELD	1500X749X750, 2mm	TPE	1



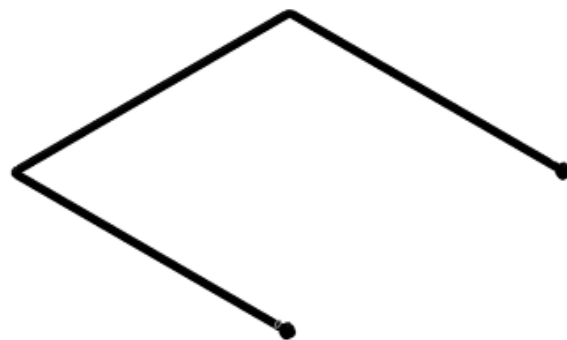
TOP VIEW



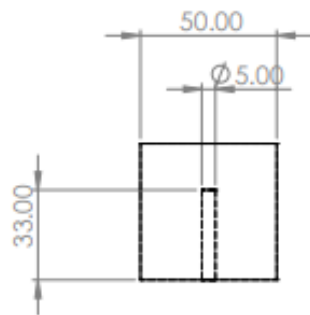
SIDE VIEW



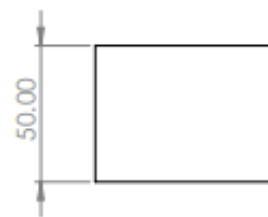
FRONT VIEW



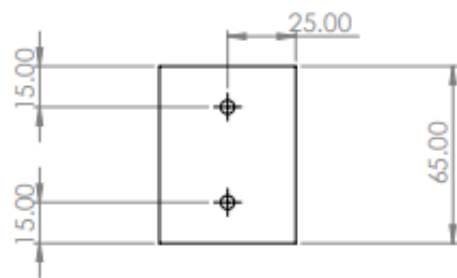
FRAME



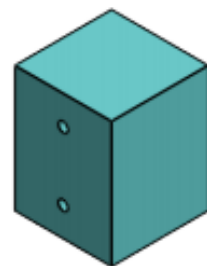
TOP VIEW



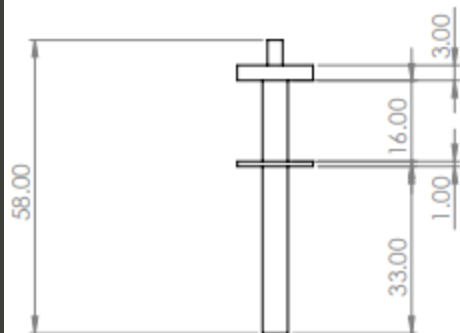
SIDE VIEW



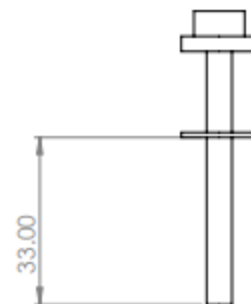
FRONT VIEW



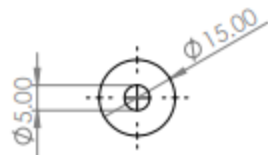
MAIN ATTACHMENT



TOP VIEW



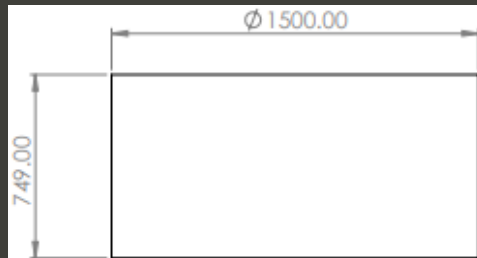
SIDE VIEW



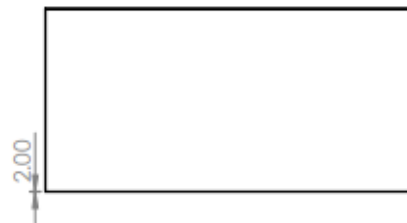
FRONT VIEW



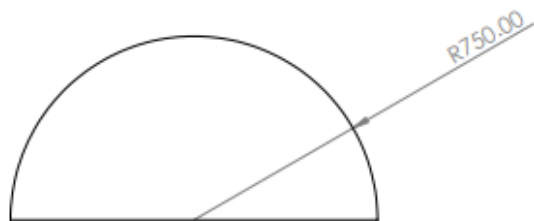
CUSTOMISED SCREW



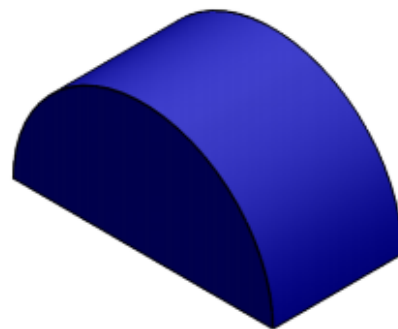
TOP VIEW



SIDE VIEW



FRONT VIEW



SHIELD COVER

PRODUCT REVIEW



Advantages

- Easy to use
- Good indicator to notify cleaners to handle the food waste
- Durable and long-lasting
- Easy to maintain and assemble
- Made of mostly Biodegradable material

Limitations

- Possibility of food getting stuck in between
- Requires regular maintenance
- Involves installation work on many tables



Qualitative Testing

- To ensure that the product is safe for commercial use
- Provide a sense of security for the consumers when using the product
- 2 Main Test Procedures in mind:
 - Food Contact Tests
 - Material Tests



Quality Assurance

- In order to ensure that the product is suitable for use, certain quality checks must be performed:
 - Quality Check of Raw Material
 - Quality Check of Manufacturing
 - Quality Check of Final Product
 - Checks Before and After Installation

Cost Breakdown

- Thermoplastic Elastomer Granules (TPE) Factory Price: \$1000 - \$2000/ton
- Taking the average of \$1,500:
Amount of TPE required to make 1 product: ~300g
300g = \$0.45
- High Density Polyethylene (HDPE) Factory Price: \$1000 - \$1300/ton
- Taking the average of \$1150:
Amount of HDPE required to make 1 product: ~700g
700g = \$0.80
- Estimated Cost per Unit (Excluding Manufacturing): \$1.25
- Estimated Cost with Manufacturing: \$1.69
- Total Units Required: 13680 Units
- Total Estimated Cost: \$23,120

Advertising Model

- Advertising Model can be used directly on the product to breakeven the cost of building the product
- Charging companies \$0.50/ sheet to pay for advertising on our products
- Using a bidding model for marketing can also be used

TENTATIVE OBJECTIVE

\$0.50 

Per Advertising
Sheet

Company Advertisement

Hawker Centres	40%
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Estimated 114 Hawker Centres in total
Roughly 100 Tables/Hawker Centre

Looking to produce 4560 units

Community Involvement

1. Educate
 - a) Educational posters
 - b) Educational/tutorial stickers on tables and on shields
 - c) Word of mouth/advertisements to promote the benefits of the mechanism
2. Outreach
 - a) Expected high outreach due to the ease of installing in every hawker center
 - b) With proper guidance, the community will be able to accept this as a new norm when eating at hawker centers

Possible Improvements

1. Slits/ holes to facilitate air circulation in the dome when it is deployed
 - Gets rid of foul smell and prevents bacteria growth
2. Include more metal frame or corrugated mechanism for better structural support

Q&A



THANK YOU

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