



SMART COMPRESSOR TRASH BIN

ELEVATOR PITCH

The Smart Compressor Trash Bin is a game-changer in waste management. With a built-in compressor and integrated software, it optimizes waste volume, time and resource requirements, as well as environmental repercussions. It's efficiency, sustainability, and innovation in one package.

OBJECTIVE

To design and develop a smart compressor trash bin that should be capable of compacting waste, operating on solar power, sending bin data, and clearly displaying it in the application. This project aims to provide a sustainable solution for addressing costly collection and disposal practices in terms of the environment and economy by leveraging renewable energy sources and advanced computer integration.

PROBLEM STATEMENT

The garbage collection process currently requires the preparation of a fixed route using heavy-duty trucks and several laborers that visits all ordinary open trash bins regardless of their waste level. This has several issues in terms of the environment, economy, and management, that drive the need for our product or similar solutions. Environmentally, the process has a high carbon footprint and bins placed in crowded areas overflow and create a visual eyesore as well as pollute its surroundings. Economically, the process is costly due to laborers, trucks, time-consuming fixed routes, and limited waste storage capacity. Managerially, collectors are unable to make data-driven decisions and plan resources efficiently due to unknown bin waste level and location.

TARGET SPECIFICATIONS

Weight Limit > 100 kg

Average Power Consumption < 100 W

Compression Time < 30 seconds

Emptying Time < 30 seconds

Compressor Pressure > 300 kg

CONSTRAINTS

Standards, Codes, & Regulations

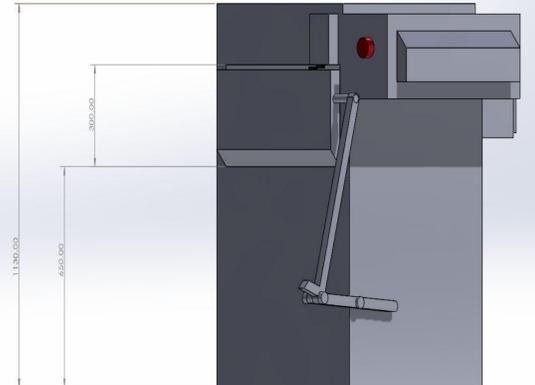
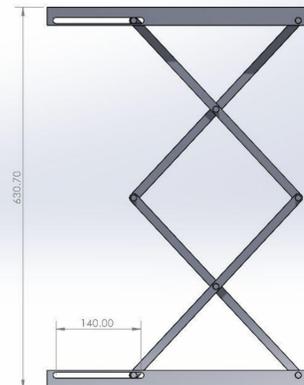
Time, Money, & Physical Resources

Improving current waste management practices

PROJECT IMPACT

- Cost reduction through waste capacity maximization, collection cycle minimization, efficient collection of only full bins, as well as the facilitation of data-driven decision making.
- Significant carbon footprint reduction through waste compaction and software integration, elimination of overflow and pollution of surroundings, as well as the utilization of solar power.
- Promotion of efficient and environmentally friendly collection and disposal practices through making their benefits obvious, inspiring positive change in public behavior and governing laws.

PROTOTYPE IMAGES



Trash Bin Status: #00209

Location:



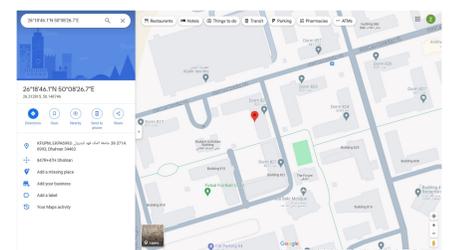
PROJECT COST



8.7 Years DPBP

TESTING / VALIDATION

```
-> Both doors are open
-> Both doors are open
-> Door 1 is closed, Door 2 is open
-> Both doors are closed
-> Both doors are closed
```



```
-> Distance: 65 cm
-> Distance: 12 cm
-> Distance: 10 cm
```

```
-> Latitude: 26.312855
-> Longitude: 50.140730
-> Coordinates changed: 0
-> Latitude: 26.312855
-> Longitude: 50.140730
-> Coordinates changed: 0
-> Latitude: 26.312855
-> Longitude: 50.140730
-> Coordinates changed: 0
```

```
-> Both doors are closed.
-> Trash slot is locked. Starting the actuator.
```

CONCLUSION

Finally, after going through various concept and product development phases, we've made a fully functional smart compressor trash bin that has significant economical, environmental, and societal impacts. Also, even though the construction of this prototype is costly, it is still feasible to implement as these costs are heavily reduced when exact components needed are known and are purchased and assembled in an abundant manner.

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