SMART GARBAGE COLLECTION SYSTEM

"GARB-IT"

Lean Start-up Management

(MGT1022)

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J COMPONENT PROJECT REPORT

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Project

Before Basic Idea...Why this idea??

- Waste management has become one of the crucial problems at present.
- The rapid growth in world population, their complex living styles and the rate of urbanization have increased the amount of solid waste produce.

Why the urge??

• The uncollected waste material when the waste bin gets full is a common problem nowadays. Thus, an efficient waste management for the waste material is essential in ensuring a clean and green surrounding environment.

1. Basic Idea

• The name of our company is "Garb-Tech" and we aim to provide a 'Smart Garbage Collection System cum Environment' which has the ability to alert the dumping trucks about the over flooding garbage bins and also locate the nearest trash bin or trash sites.

Ideas easing survival

• It can reduce human work during filtering and collection of wastes from areas which can contain wastes which could be comparatively more harmful due to the nature of the waste,be it nuclear or chemical.

When Ideas meet technology...

• We have created a technologically sound garbage collection system by utilizing technological concepts involving networking and IoT (Internet of Things) and aim to use this proposed technological product for creating a service-providing business..

What does the project focus on??

• The primary objective is to create a smart waste management system through which we can provide an efficient solution to the problem of waste accumulation and over flooding of garbage bins.

• The project is aimed to generate alerts and assist the waste dumping authorities for regular and proper waste collection from garbage bins through our proposed technological product.

• Our project also proposes a trash bin locator which could help the garbage collectors by providing efficient routes to the garbage collection sites. This functionality can fulfil our objective to reduce fuel costs and prevent time wastage.

• Our aim is also to create a new start-up business by providing a unique and smart garbage collection system. Our objective is to utilize this unique garbage collection mechanism for creating a service- based business.

What's more??

• Our System will inform the status of each and every dust bin in real time so that the concerned authority can send the garbage collection vehicle as soon as the dustbin is full.

2. Supporting Arguments

• Product is unique in its application.
• Large market for the product exists. Potential markets are household and government need which is abundant in India.

• Absence of any significant competitors – Only the primitive garbage collection system exist in poor health due to lack of management and utilisation of technology.

Why we have the edge ??

•There are no business model like this in India yet.
•The bins are manufactured locally and hence are very cost effective.
•We are not only providing the product but also the services associated with it.
•We require minimal additional components and upgrade the existing product itself.
•Our product is much cheaper and durable.

Why we are the smarter option??

• We are giving government a smarter , cost effective and efficient system to manage one of the most important urban issues.
• The government is working towards home made technology and in house manufacture and we are promote that idea.

Who else is by our project's side??

• Not only the government but the private societies can be hugely benifitted and can generate huge revenues.

Other Strengths:

1. Real time information on the fill level of the dustbin.
2. Deployment of dustbin based on the actual needs.
3. Cost and resource optimization.
4. Improves Environment quality -Lesser smells -Cleaner cities
5. Usage of dustbins.

More scope in Future

• By implementing this proposed system the cost reduction, resource optimization, effective usage of smart dustbins can be done. This system indirectly reducing traffic in the city.

3) Funding

Methods of funding

• Government Grants - Practically Difficult to obtain

Other ways --

• Crowd funding
• Raised from investors

Approaching bank for funding

• Making sure we have the following details.
• Balance Sheet, Profit-and-Loss Account, and Cash-Flow Statement
• Budget for the Current or Coming Year
• Financial Situation

List of funding agencies

- SIDBI- Small Industries Development Bank of India
- DIC- District Industries Centre
- NEF- National Electricity Fund

Smart bin Funding

Our project has an estimated budget of 2510
INR per smart bin. Funding by :- Small Industries Development Bank of India

- Funding amount :- 60 %
- The project cost for 100 Smart Bins – 2.51 lakh.
- Funding from Small Industries Development Bank of India i.e. 60 % subsidy,
- And hence he has to only invest 40 % of 2.51 lakh i.e. 1.04 lakh in project.

4. Existing Model

- Based in San Francisco, Compology sensors that automatically monitor fullness and contents. The device features GPS tracking which records when a container gets picked up and put down.

- It recognizes, sorts and compresses waste. Once the device identifies the material, it is distributed into the appropriate bin within the container – plastics, paper or glass.

- Company such as BigBelly, which is a U.S. based firm, their product is used to collect garbage at public places parks, beaches, retail properties, etc.

5. How will you implement your project??

We have identified our potential resource providers based on their reliability and price:

- Ultrasonic Sensor & Arduino - from Amazon
- Wires – from Havells
- Waterproofing material – From pedilite company
- Fuel – In the form of petroleum, diesel or most preferably CNG
- Plastic – From recycling plants

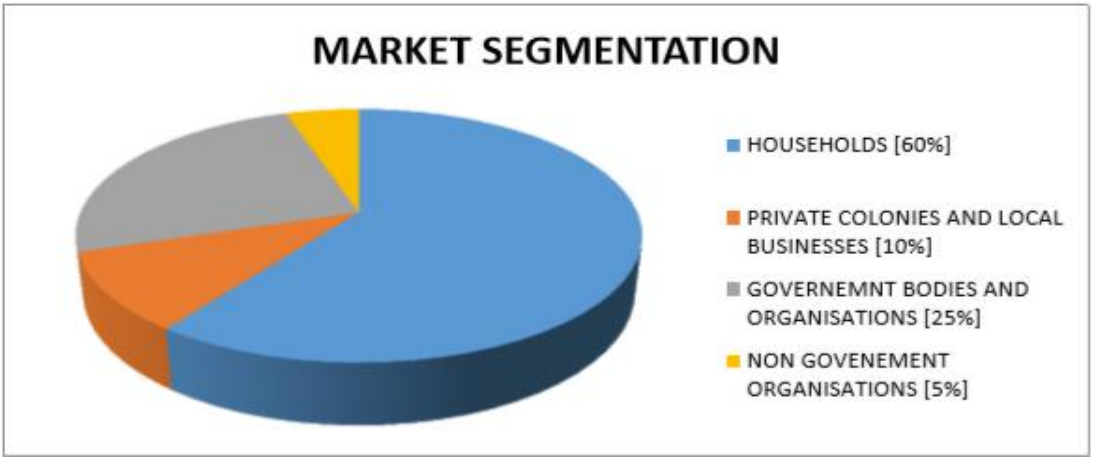
- The outer areas of the city are most favourable for setting up the plant since the noise, waste generated will affect as few people as possible.
- Our raw materials are technological hardware components which can be easily imported to the manufacturing unit.
- To implement it on a business scale, a proper PR team will ensure proper launch and grab customer focus.
- We can get the amount required for the project from the investors as discussed in funding part.
- This is totally ecofriendly project. Under government initiated youth-driven schemes like "Youth vie Grants" ensures that youths can involve themself into government plans to help society. Cheap dustbin makes it more accessible to commoners.

• As our product can be utilised in public places, our target locations are parks, malls, theatres, etc.
• They can also be urban areas with dense population as well as rural areas with high population.

6. Our Target Audience

• We have focussed on identifying market segments for our product by the application of Demographic Segmentation and Geographic Segmentation.
• As per the above description, the main market segments are represented in the following pie-chart .

• Households - 60%
• Private colonies and local business - 10%
• Government bodies and organisations - 25%
• NGOs - 5%



Considering the first two prime customers -

• Individuals or Households - the demand for our product is directly proportional to the number of individuals in an area. Thus, highly populated cities like Kanpur, Kolkata, etc. are our targeted markets.Government is our second most promising market segment. Based on the recent policies of government regarding installation of garbage bins on roadside

• We estimate that at each five hundred meters interval, a dustbin needs to be deployed for less travelled roads.
• At each two hundred meters interval, a dustbin needs to be deployed for highly travelled and busy roads.

Smart Trash Bin Market By End User Analysis

• The Smart trash bin market has been segmented as below:

By End User Analysis:
• Residential segment
• Commercial segment

Residential segment
• Widely used by Houses/Residencies.
• Also smart kitchen dustbins that transform the food waste to healthy and fertile soil Also gives you liquid organic fertilizer, drain and toilet cleaner.

Commercial segment
• Widely used by Industries/Product manufacturers to store the waste.
• Used for commercial purposes.
• Expanding in regions that are rapidly urbanizing and generating a high volume of waste.
• Industrial garbage bins.
• Adopting performance-based financial business models to encourage capital investments.

7) Sources to reach target Audience

We will adopt the following methods for promoting sales of our product
• Blog - nowadays people read blogs a lot and their thinking get based on it .

• **SEO -** Search Engine Optimization techniques in our posts, so that your page appears in the top places of search engines.
• **Email-** Marketing-Creating a newsletter, for example, and send important information via email to people who leave their email addresses on your page
• **Video-channel**- Having a video channel in YouTube or similar kind of websites
• **Events** - We will conduct events in and around the country demonstrating our product to common people
• **Partnerships and Promotions-** We will try partnering with big industrialists so that they promote our product.

• There is a need to capture government's attention, by linking the product to 'Swachh Bharat Abhiyan' ,to gain financial help and promotion to prevent economical losses in early phase of business.

• 'Skimming Pricing' can be done in which the price of a new product is set high to establish itself as a premium or high – quality product

• We can opt for 'Product Development' as our marketing strategy, in which the market share of the product can be high as the product is unique and market for the product is already present.

8.1 Factors that may lead to success

• The initial goal strategy is to try in one city then replicate to multiple cities, which reduces risk and increase success rate.

• The product is designed using most open source components there by any city can scale it up and manufactured in large volume which is add on to our project's success.

• Our project qualifies all the factors of service and the system is up to mark performance device .
• We care lots of things from user's perspective before heading towards the system.
• The system have its own business model to create sustainable revenue for the Cost of Arduino chip.

8.2 Factors that may lead to failure

Meeting non-functional requirements of system is a threat:

• Execution qualities, like security and quality, that unit evident at the run time is one challenge.
• Evolution qualities, like liabilities, maintainability, flexibility and quantitative, that unit embodied among the static structure of the code.

9. Cost and Profit in this project

• The estimated hardware device component cost is Rs. 2,510.

• Set – up costs for assembly machinery, hardware tools, infrastructural needs, device hardware component cost, expenditure is to be around Rs. 4,70,000 per month.
• The running cost - We have come up with the salary analysis for the different employee posts for a month assuming a total production of 150 models / month.
• The total evaluated salary cost sums up to Rs. 10,00,000 per month.
• The forecasted maintenance cost is to be around Rs. 400,000 per month.
• Keeping all these expenses in mind, our start-up cost rounds up to around Rs.18,70,000.

• **Break-Even analysis :**

TOTAL COST = FIXED COST + (VARIABLE COST * n)

FIXED COST= Rs. 18,70,000
Proposed Selling Price = Rs. 3900
Variable cost = 200
At break–even point, TOTAL COST = REVENUE
n = 1870000/(3900-200)
n = 506

• Through break even analysis, we have estimated that around 506 units of our product are needed to cover up the initial investment on product manufacture.
• After 507th unit, our business is expected to generate estimated profit of Rs. 1,390 per item installation.
• The following graphs shows the monthly estimated profit from the month of September -

10. Limitations

- The Process is not always cost effective
- The Resultant Product has short life.
- The sites are often dangerous
- The Practices are done uniformly
- Garbage Segregation is Difficult.
- System requires more number of waste bins for separate waste collection as per population in the city.
- Sensor nodes used in the dustbins have limited memory size.
- The training has to be provided to the people involved in the smart waste management system.

11. Contributions by the members

- **Manya Smriti**

1) Themes of both reviews.
2) Basic Idea
3) Presentation of PPTs and compilation
4) Idea of Video and its presentation

5) Factors that may lead to failure
6) Contributions of group members
7) Implementation Strategy
8) References
9) Summary
10) Future Scope

- **Animesh Srivastava**

1) Existing Model in the market
2) How will you implement your project
3) Target Audience
4) Sources to reach target audience
5) How much cost and profit will be in the project?
6) Implementation Strategy
7) Future Scope Of project
8) References

- **Charan Kumar Pyla**

1) Funding
2) Target Audience
3)Analysis of users
4) References
5) How much our project is beneficial to society?

Arun Kumar Giri

1) Supporting Argument
2) Factors that may lead to success and failure
3) Limitations
4) References

- **Alok Mishra**

1) Strengths
2) Made video over the bin.
3) References
4) Future Scope Of Project

12)

How the smart bin will be beneficial for the society?

• Waste collection services do not have data available in real time to tell them if a bin is empty or full and ready for collection. This is not an effective way to manage waste.

• Smart bins solve these issues quickly and easily and governments around the world are catching on.

BENIFITS

With the combination of intelligent waste monitoring and trash compaction technologies, smart bins are head and shoulders above traditional garbage bins. Cities installing smart bins can enjoy:

- A reduction in the number of waste bins needed
- A reduction in the number of waste collections needed by up to 80%, resulting in less manpower, emissions, fuel use and traffic congestion.
- Improved environment (i.e. no overflowing bins and less unpleasant odours)
- Analytics data to manage collection routes and the placement of bins more effectively

Incredible Recycling

Our product goes hand in hand with governments smart city projects. Private apartment residencies can continue To use this technology for a long time

13. Future Scope

- Our product is based on the uprising IOT technology which is expanding worldwide.
- Solving waste management issues is governments top priority, and our idea goes hand in hand with that vision.

We plan on starting our business from community level and start expanding to local municipalities. Also, private institutions and firms can be our customers.

- Depending on our net profits, we may consider exporting our technology.
- We will add on more features to bin which would help in seggregation of wastes more efficiently.
- In future we would make the device self sufficient such that it recognizes, sorts and compresses waste.
- Once the device identifies the material, it is distributed into the appropriate bin within the container – plastics, paper or glass.

14. References

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15. Summary

Our project deals with one of the most heated topic of era - management of waste.Efficient waste management using IOT supported dustbin by our company named "Garb-Tech".It alerts the trucks once the bin is full. Wastes can be segregated on the basis of areas for example an bin in the main town would have more contamination due to presence of wastes than a less populated area. It alerts the trucks and traces the route. It saves fuel,time and money.The biggest supporting point to our project is its uniqueness and no market competitors so offer though being a need of hour.

We may receive our funding from funding agencies like SIDBI, DIC, many subsidies. One of the existing model is BINE. Implementation includes deciding manufacturing location to be in outer areas to raw materials. It also needs proper exposure through ads.Targeted customers are households, private colonies and local business,government bodies and organizations added on with non government organization.Sales Strategy of our project includes social media platform. Marketing strategy includes linkage to Swachh Bharat Abhiyan. The product being cheap, useful and best strengthens its success while proper implementation maintaining quality is a threat.

Our project estimated cost is Rs 18,70000 which would recover all its invesment in 506 bins installment.Future scope includes expansion of startup in other areas to addition of seggregation features in bin.The limitation being the memory size, harmful collection sites and

initial employee training.It is beneficial because waste collection these days doesn't have any data of it being full leading to either wasting fuel or polluting suburbs.Recycling, lesser manpower,low emissions and fuel use is a major plus point.