

# Front End of Innovation: Reinventing the Trash Can



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**ENT 4700  
10 July 2012**



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## **Summary**

In this report we will discuss our team's progress throughout the first half of the semester in developing a marketable idea that fulfills an unmet need. Also included in the report are the steps taken to generate and select an idea that fits the team's problem statement. After completing the first half of the course, our team has selected the idea of sealing garbage bags to reduce and seal odor from garbage cans.

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## **Introduction (MB)**

It is that day of the week that everyone dreads, garbage day. Often it is the fight of the household gladiator to slay and tame the unpleasant odors of garbage cans. As a result, flies, maggots, and bacteria feast on the smelly victory of garbage. In this report, we will explain our new product, the Trash Pack. Essentially, it is a vacuum sealed trash liner that will contain and reduce the odors of garage. Our product introduces a new idea into an industry that is focused mainly on storage, removal and disposal of waste. Containing odor will not only change homeowners emotions on garbage, but it will contribute a clean, healthy, and odor less lifestyle for Americans.

## **Heuristics and Architecture (MB)**

Great buildings start with a solid foundation. Similar to buildings, our team reviewed great architecture and systems to provide us with bases for our project. Overall, as complex as architecture may be, all great designs must have a simple face with inner complexity. Relating this to our trash project it is important to have a simple bag, body, or frame that is easy to use. Overall this places the complex components on the inside of the trash system creating a simple user interface. Another key heuristic for this project was if the trash pail or bag were to be enhanced, it must be better than the original product. Again it is important to keep it simple and improve on existing trash removal and storage technology. If we don't improve or enhance the trash removal process, then our product is not useful to the consumer. As for architecture, our team understands key components to the trash technology to improve trash systems. After finding the unmet need of odor reduction in trash storage, we understand that some sort of sealant or chemical technology will be within the system. This will provide the consumer with an effective and useful product to decrease trash odor.

## **Concept and Description (MC)**

Throughout the entire semester we have used various ways to generate new ideas. The initial step to generating new ideas was finding a problem area that we can tackle. Without having something to enhance, there is no point to generate ideas. The initial step we took was to painstorm. Defying all odds that "eureka" moments don't happen, we had a "eureka" moment.

While taking out the garbage one day, it was apparent how much of a pain it is to do. The garbage always smells, it's difficult to carry two garbage cans at once, and there never seems to be enough room. We suddenly realized that there hasn't been any breakthrough in garbage pails since it went from metal to plastic. As well, garbage is becoming a larger issue to dispose of every year. There doesn't ever seem to be enough space, and landfills are dwindling and filled to capacity as is.

Thus, the group set forward to solve the issues to eliminate the smell and try to minimize the space used. The initial ideas came up short and were not very novel. Through much iteration

of concept fans and six hats methods we finally had a list of 10 good ideas. However, the ideas alone weren't enough. We decided to sit down and give it one last try to come up with something so novel that no one has ever thought of which brought us to our main idea.

We combined two different ideas, a garbage pail and bag that could compact the garbage in a smaller space, and a garbage pail that would seal off to the environment so no odor would be released. Our idea shares the same kind of concept as the Space Bag (see photo 1)

Photo 1: Concept taken from the Space Bag. The garbage can would have vacuum sealing capability to compress and seal the odors. A small portable vacuum can be placed anywhere outside near your garbage cans and has no maintenance involved.



This idea came a long way to develop from having a late start because of multiple changes in plans. It goes to show though that you must dig deep for a novel idea. We are not the only ones trying to come up with a “billion dollar baby”, and the present competition is fierce. By staying persistent and overcoming our setbacks, I believe we have come up with a great idea. The steps were sporadic and didn't always go to plan, yet I believe that contributed to the success of our idea. Going off the track makes you stumble across some very different product ideas.

## Idea Generation

During the course of the semester, we used methods demonstrated in class such as DeBono's Six Hats and the Concept Fan to help generate and organize our thoughts and ideas for a waste management product that is innovative yet marketable to move toward the back end of innovation.

### **Six Hats and Trash Pails (GG)**

After going through various ideas our team decided that we were going to try to improve the trash pail and bag, something that has remained unpleasant to deal with and relatively untouched for the past fifty years. Upon hearing this we all had an initial storm of ideas, ways we could think of to make taking out the trash less of a pain.

We decided to use one of the tools we learned in class to organize and further develop our ideas; this is where DeBono's 6 Hats method came in. We used the same order we had used during the water bottle exercise in class, as our team felt that that particular order of hats helped us delve into the problem and produce some considerably revolutionary ideas.

Starting with the Blue 'Process' hat, we came up with the problem statement of: 'Taking out the trash is an unpleasant, smelly and at times difficult chore'. We then moved to the White 'Facts' hat, in which we listed known facts about trash pails, their components, uses, etc. This helped us in thinking about the individual components and how each affects the process as a whole, which helped us a few hats later when it came time to come up with ideas. As a result, we were able to think about what specifically needed to be changed in order to make the process less unpleasant. Listing the facts also helped define how people use and store trash cans, which gave us other potential areas to improve on.

After the white hat came the Red 'Emotions' hat, in which we ask ourselves, "How do you feel about taking out the trash?" Not surprisingly, most of us answered with negative feelings, those of disgust, reluctance and frustration. Taking out the trash is indeed seen as a pain by most, as it involves taking time out of ones day to haul one or more clumsy large objects full of unpleasant smelling waste material. These cans often tip over, blow away in the wind, and get hit by cars or break, contributing to the annoyance that most consumers feel toward them.

After we had determined the common frustrations with the current trash managing process out of the way, it was time to come up with ways to improve it. Using the Green 'Ideas' hat, taking turns and building off each other's ideas, we developed possible ways to make the components of trash cans more effective and user friendly, thus making the process easier and more pleasant. The objective of the green hat is to foster creativity and innovation, and thus no idea, no matter how wild was kept off the table.

Some of our ideas included: trash pails with sealing/locking lids to prevent odor and reduce bug infestation; differently shaped trash pails stable in the wind, preventing them from blowing away and being hit by cars or tipping over; possibly adding reflective materials to improve visibility. Pails with multiple handles also came up as this would make picking them up easier and perhaps provide benefit to waste management employees who pick up trash cans repeatedly. This then transformed into the idea of interlocking handles, making it easier to transport more than one trash can at a time. There was also mention of wheel improvements. Camouflaged or aesthetically pleasing trash pails were mentioned so that they could be permanently stored outside and away

from your home. Overall what resulted from our green hat was a solid foundation of various flaws, listed in Appendix C, that we saw with current trash pails and clever ways we could improve upon them.

Next were the Black and Yellow hats, respectively representing the ‘Pessimistic’ and ‘Optimistic’ thoughts associated with our ideas. Using the black hat first, we found that many of the ideas we came up with may involve research and testing. Therefore, they would be considerably expensive to develop and could result in the product itself being more expensive. The complexity of the pail compared to pails on the market would also drastically increase the price. There was also the worry that if we created a trash pail with a sealing lid, a child could potentially climb into the pail and be sealed inside, thus cutting off their oxygen supply. Another caveat was that the new trash pails may be heavier than the current ones if they are to be more stable and wind resistant.

After looking at the downsides, we began to look at the possibility that would ensue if we were to succeed in making trash pails a more pleasant experience. If taking out the trash was no longer as unpleasant, perhaps people would be less reluctant to take out the trash and the customer would be relieved of one source of frustration in their lives. Also, if we were able to successfully implement the sealing lids, trash would no longer have a foul odor and the probability of finding maggots under your trash pail would be reduced, providing for a potentially cleaner and more pleasant environment. It is also a possibility that employees at the company that would produce these new trash pails would feel a sense of pride and purpose in the product that they are helping to create, thus providing a good work environment. Waste management employees could also benefit from our innovations as easily maneuverable and odorless trash pails would surely make their jobs more pleasant. Both Black and Yellow hats are listed in Appendix C.

Finally moving back to the blue hat, we were able to narrow down our list of ideas to those we thought had the most potential and from there our team decided that our focus for this project was going to be reducing the odor of the trash pail by creating an effectively sealing lid or liner. We decided there were a few other components we liked that could potentially be added into the final product such as reflective tape and multiple/interlocking handles, but our main direction for the engineering team would be to focus on odor reduction.

### **Debono’s Concept Fan (MB)**

As part of the front end of innovation one of the strategies our team used to develop and organize ideas was the concept fan, as seen below in Appendix A. The process begins with each team member starting with at least 5 ideas. Next each idea was placed in column where it was connected with a general concept. Then each concept was part of a much greater concept. The process continues from idea to concepts by asking how the task can be done.

Relating the concept fan to our problem statement, which is to reduce and seal odor from garbage pails. Some of the ideas from the fan were focused around mobility, using truck tires or roller blade wheels to improve. The compression chamber system will help reduce odor, compact the trash, and make it easy to transport to the curb. Essentially, it works similar to the bank drive thru, instead of having a slot for your driver’s license it will provide a sealed transport to the curb. After moving across the fan, our concepts and ideas got larger. Simply by asking, “How can it be done?” After generating some ideas, the larger concepts of customer health and community

sustainability took shape. This concept was extremely important to our team, to create a quality product to achieve customer satisfaction. We can possibly use that to enter new markets with our product. After generating the fan, we reviewed the ideas generated in the concept fan and six hats process to see what was best solve garbage can odor.

## **Function Diagrams (MC)**

The approach to the functions diagram was to study the process of garbage storage and removal in households. By doing this our team was to analyze the system of actions for household garbage removal and try to optimize or eliminate a function. Below in Appendix B, is the process diagram generated by the Trash Tech team along with additional opportunities and ideas we developed. Our product does not however truly optimize the process and was primarily developed from the DeBono's Six Hats and concept fan.

## **Commercialization study (JF)**

Since, we are just beginning of the back end of innovation. We just started analyzing current market trends in the waste management industry. By focusing on the idea of sealing and reducing odor, Trash Tech is in a unique position to begin our study before taking our product to market. Since the trash bag market is a highly competitive, we plan to differentiate our product on healthiness and odor reduction. Essentially, our product will improve quality of life in the homes of millions of people. This is how we plan to offset both the higher initial and long term costs of our product. To support this plan, we need to do market and customer research. This includes going out to local retailers and polling customers on the idea and pricing. Also, we need to look at our competitors pricing strategies to judge how that will affect our pricing and marketability. Both of these will influence our pricing and give insight into the plausibility of effectively creating a business around our product. We also see a trend being taken by governments to reduce/eliminate pickup and to regulate the disposal of trash. This may be beneficial to our product if we can lobby or receive government support directly or indirectly.

We think it's plausible to take a one percent market share of the U.S. market. We estimate that revenue will be roughly \$32,000,000 after we scale up operation in several years. Expansion outside the U.S. is also a viable option but will be reserved for after we establish ourselves inside the U.S. Manufacture will be in house and will require capital injection to build into an operational stage. We plan to utilize the distribution centers of common retailers such as Target and Meijer

which will reduce overall expenses and logistical problems for the pails and bags. The bags may also be sold via internet distribution centers since they are light and small. Further market research will be required to determine our specific business and growth prospects.

## **Conclusion (JF)**

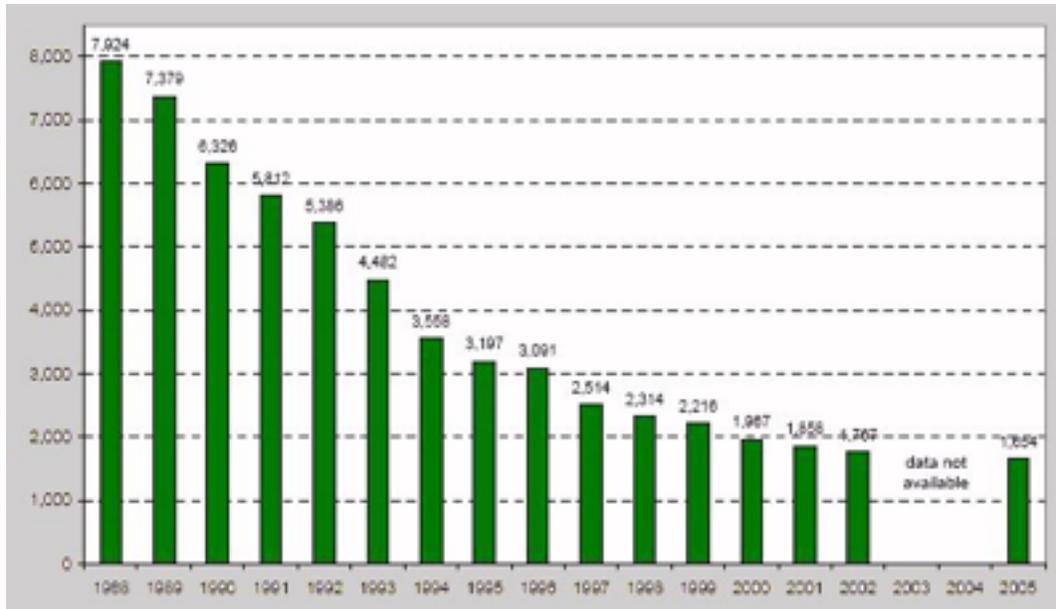
After the completion of the front end of innovation, we are committed to enhance homeowner's emotions about trash removal by simply sealing odor and bacteria from the surrounding air. Initially, the painstorming process helped define the pains and problems related to trash storage and removal. This provided us with our problem statement to solve the unmet need to reduce the smell and optimize space in garbage cans and bags. From the DeBono Six Hat Process and Concept Fan our team was able to generate and organize ideas. These techniques created many possible solutions to our problem statement. In addition, a function diagram assisted our team to understand and organize the steps required to remove and store garbage in households. This created opportunity for our team to add or remove steps from the process.

Moving forward, we are excited for the opportunities presented in the United States market. Currently, our team is projecting to try to enter and gain 1% of the market share. This would create about \$32,000,000 after we increase operations. Transitioning into the back end of innovation, we are seeking investors to help grow our product into diverse markets such as the work place or even the healthcare field. Overall, Trash Tech is seeking funding to increase manufacturing, marketing, sales, and transportation of products to ensure a Trash Pack is in every household.

## **Problem/ Opportunity (MC)**

Garbage has and always will be a problem in our World. In addition to our odor problems stated in the front end, we have yet to come up with a viable solution to dispose of our garbage. We have tried incinerating it, shipping it into space, and now burying it. All of these methods are temporary fixes due to their limitations. Incinerating the garbage was bad for the environment and let off too many destructive gases to the environment, shipping it into space was costly and polluted our orbit, and lastly we can only bury so much garbage until we have no more room.

The following graph shows the decline of landfills from 1988 to 2005. There were 7,924 landfills in 1988 and 1,654 landfills in 2005. What is an even more drastic number to compare this statistic to is the population expansion in the United States. In 1988 there were approximately 244 million people, compared to 2005 there were approximately 296 million. Landfills are decreasing, and the population is increasing, thus more waste and less space.



Graph 1: Landfills in the United States

The space for trash is going to become a huge problem; it is simply a matter of time. No one has yet to tackle the root of the problem, that's why Trash Tech has viable market and solution. The opportunity we have is to offer an irresistible solution to large metropolises. It will cut down on trash pickups, cut down on space of the trash, and inevitably cut down the cost of dumping into landfills.

## Technology and Product Plans (MC)

Our technology is in the concept stage and has yet to be fully prototyped. It will take some time to fully develop our idea and make it a usable, reliable product. The initial step is to build a trash pail with collapsible, biodegradable bags. It will have the functionality to use a shop-vac to vacuum seal and pack your garbage. The bags will be zip-lock so you can reopen and put more garbage in. As seen in figure 1, both the bag and garbage pail will have coinciding slots so that there is maximum vacuum packing.





Figure 1: Garbage bag and trash can concept

There are many things we can expand to with our technology. Eventually we hope to innovate garbage bins, creating less stink and more space. Other viable markets to expand into can be vacuums, our own line of sealed bags, and possibly our own garbage disposal service. Initially we want to focus on our initial product and slowly expand and revolutionize trash disposal. Trash Tech has the knowledge and experience to become a major player in trash removal. We are trying to address an upcoming problem that will need to be addressed in the very near future.

## Market (MB)

In 2010, Americans generated 250 million tons of trash. This is roughly about 5 lbs per day. Currently, these rates continue to climb as landfill storage decreases. Overall, the waste management industry is worth about billions of dollars and is broken up into collection at 55%, treatment and disposal at 20%, and remediation at 15%. In 3 to 5 years, the industry will have a slow, but steady growth. With the increase of American trash volume and decrease of storage space, it is projected that the industry will grow slowly at 3 % for a three year period. This growth is driven by the need for landfill space optimization. Lastly, fuel prices are continuing to climb causing waste removal companies to charge more for their service. Trash Tech is able to distribute and reach our customers by infomercial sales and key online contracts with Amazon and Google as

well as traditional retail stores. This will help get our company name out to a wide customer base. With a market survey we are able to gain sales from 25% of American homes. We are selling our product at \$15.00 a box with 100 bags per box.

## **Customers (MB)**

Our customer base is broken into 3 categories: homeowners, businesses, and municipalities. Currently, we are marketing more towards the homeowner section of our customers. With a market study, we would be able to sell to 25 % of 125 billion homes. The Trash Pack will be at a conveniently low price of \$15.00 for a box of 100 bags. This price was obtained with the cost of one bag being \$0.50 with \$0.02 cost of labor. Resulting in the cost of production for one hundred bags being \$3.40, and at \$15.00 per box resulting in a revenue of \$1,950,000 for year two. With a key alliance with Amazon, we will be able to have a large customer base through an online purchasing contract. This will allow us to stick to our core strength of reducing odor and optimizing trash space. Reaching our homeowner customer base will be achieved through television infomercials and advertisements in Better Home and Garden Magazine. Again, we are stressing major health and hygiene benefits with the reduction of odor and sealed storage.

As for businesses and municipalities, key contracts must be acquired to grow this section of our customer base. A city like New York generates 12,000 tons of garbage per day. Currently, New York spends \$2 billion on trash removal. With EPA support and a government mandate, a trash pack contract with New York City could result in a \$1 billion cost savings. This is achieved by the decrease of the number of trash pickups since the Trash Pack optimizes storage space. This will also have cost benefits since the space of landfills is decreasing. The Trash Pack will occupy less surface space in city landfills while decreasing CO<sub>2</sub> emissions into the atmosphere. Again, we hope to grow this side of our business. Currently, we are focusing on larger, dense cities, since their needs are the most urgent. Key networks and contracts must be obtained to provide waste management storage services with these cities. Our current strategy is to focus on the need of larger municipalities to deal with a large amount of trash in a relatively small location.

## **Competition (MB)**

After analyzing the market place, our key competitors are Procter and Gamble, Clorox Company, Hefty, Republic Services, and Waste Management. All of these companies are very successful and established as key players in the waste management industry. As large established companies, they are able to react to change since they each hold a large portion of the market share. Another key strength is Procter and Gamble and Clorox is tightly networked with many of the largest retail stores in the United States. For Waste Management and Republic Services, they have large contracts with cities and businesses, creating vast customer bases and networking systems. Another key strength for large competitors is their cheap manufacturing of garbage bags and research and development divisions. Procter and Gamble spends \$2 billion on improving and introducing new product lines every year.

The weaknesses for our competition are very similar. Hefty, Procter and Gamble, Clorox Company, Republic Services, and Waste Management have high operating/legacy costs. One example is Waste Management's fuel prices for trash removal which fluctuate yearly with the price of oil. Another weakness is that Procter and Gamble is too diverse in the L'Oreal women's line and it does not target male customers. This results in lack of growth for the product line. The final weakness relates to both Procter and Gamble and Waste Management. The lack of leadership of online media is causing issues with volume growth. Again, this creates problems with online marketing since these companies are retail or service based resulting in the limitation their customer base and company awareness.

Reviewing our competition, we have a few advantages to help us gain market share and traction. Again, Trash Tech is a smaller operation. Therefore our company has lower overhead, manufacturing, and marketing costs compared to our competitors. We want to be very aggressive with our marketing spend, starting with \$75,000 in year to introduce our product to the market. This spend will increase to \$100,000 to establish a customer base for our product line. With online promotions and key connections with Amazon and Google, Trash Tech is able to exploit the online media market. We also can use free promotions on networking sites and blogs. Another key strength is that we are not a large, established company. This allows Trash Tech to see an opportunity in storage and optimization rather than the current market trends of garbage removal. This allows us to aggressively enter a new section of the market, resulting in adaptability of our \$100,000 research and development spending. Overall, this places Trash Tech in a unique position to introduce new product lines as an established company, pushing the company near the top of a new sub-market of garbage storage.

## **Operations (GG)**

Our team plans after the initial prototyping and testing has been completed along with the first purchase order being obtained to acquire a manufacturing facility to begin production of our product. We plan to purchase a manufacturing facility in the Detroit area to keep our business local and perhaps boost the city's economy. Furthermore according to commercial property listings such as Loop.net, the average price of a small 31,000 SF manufacturing facility in the Detroit area is around \$20,000. This makes facility costs low for manufacturing operations.

Although the price of the building itself seems low, the repairs, taxes and utilities will push the amount of initial cash needed upward. However, the city offers incentive for new businesses, which we plan to take advantage of by applying for an 'Industrial Facility Incentive' certificate through the city of Detroit. This program provides a tax incentive to manufacturers in order to enable renovation and expansion of aging facilities as well as building of new facilities within the city. An IFT certificate entitles the facility to exemption from ad valorem real and/or personal property taxes for a period of 1 to 12 years. Applications are filed, reviewed and approved locally with the local unit determining the number of years granted, but they are also subject to review at the state level by the Property Services Division and the Michigan Economic Development Corporation. The State Tax Commission is ultimately responsible for final approval and issuance of certificates. The approximate cost of machinery and labor initially will total to \$1,150,000. This

is for 5 machines and 10 workers at 40K a year with benefits. Union contracts will likely have to be drafted and approved with the workers. Training programs may also be needed for the specialize manufacturing of our product.

Suppliers are another important factor in our operation plan. In order to manufacture the bags, the plastic components from which they are manufactured must be obtained. Our team has researched several regional plastic suppliers and identified BASF, Birch, RTP and Bamberger Plastics as potential suppliers specializing in polypropylene, which is the main component in plastic bags. The next step is to meet and develop relationships with these respective companies.

Certain regulatory requirements also factor into our production plan. For bags made of plastic materials, it is required that a 'choking hazard' label be printed on the bags in a font size specific to the size of the bag itself. The minimum size of garbage bag proposed would require 24pt font. These requirements are intended for plastic bags with a thickness of less than one 1/100 inch and have an opening size of seven inches or more and are decided by the state.

## **Alliances (GG)**

In the beginning years of a company, it is often true that the relationships and connections developed with other companies, suppliers and consultants can be a key element in establishing a reputation and sustainability.

Our company plans to develop a relationship not only with our suppliers, but also with academic institutions, such as universities and the American Society of Chemical Engineers, which would provide an advantage in the research and development field. Although our research and development is done in house, it is important to maintain relationships with outside sources, as there is potential for collaboration or even recruiting.

Since our company's primary goal is to eventually work with the municipal governments to implement our product, we also plan to develop relationships with city/county officials and legislators. Initially this will be done through networking and positions on our company's advisory board. We hope to also work with the EPA and Michigan Department of Community Health as well as the GMP (glass, molding, plastic) Allied Workers union as is necessary to establish a manufacturing facility.

Our company plans to retail directly through websites and other media such as infomercials. Due to this, we may want to establish connections with major online marketplaces such as Amazon or search engines such as Google, as they are already well known in the online community and have a large existing customer base.

## **Management Team and Advisory Board (GG,MB)**

As a start-up company it is important to have the advice and expertise of those who know the industry and market; as incorporating their knowledge would help us to make more informed

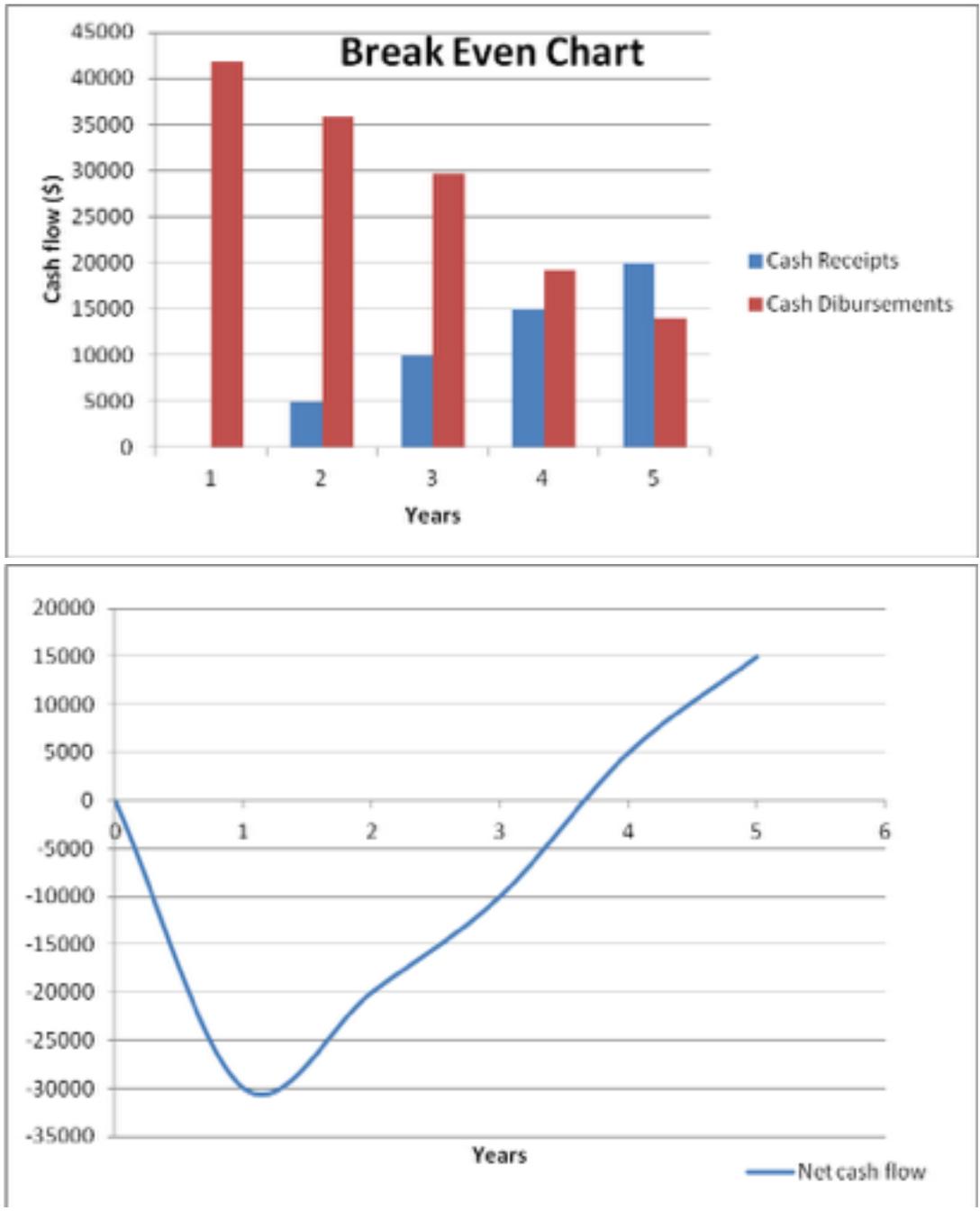
decisions and thus set our company on a successful path. We believe the following industry leaders, more precisely their respective qualities, would be incredibly beneficial to our company:

- Sergio Marchionne (CEO, Chrysler-Fiat LLC) - CEO  
Mr. Marchionne's impact of Chrysler has certainly been a noticeable one, as through his leadership the company has made a major turnaround. Such leadership and decision making abilities such as those he has demonstrated are essential to a growing company.
- Dr. Chris Caplice (Executive Director, CTL,MIT) - Director of Logistics  
Supply chain management/Logistics expert
- GMPIU Union Liaison – Director of Labor Relations  
The GMPIU is the Glass, Molding and Plastics Industry workers union, if our company is establish a manufacturing facility to produce our Trash Pak, we would need to establish a relationship with the union responsible for the labour force. Including a union representative would help to facilitate the relationship and add an important perspective to the advisory board.
- L. Brooks Patterson (Oakland County Executive) - Director of municipal relations  
Connections and legislation advice /gov't regulations
- Charles H. Whiteman (Dean, Smeal College of Business, Penn State) - CFO  
Our company needs an advisor who is knowledgeable and experienced in business and marketing to ensure the best possible decisions are made with respect to marketing and finances. Whiteman's expertise in financial planning, experience in the field and academic background would be valuable in making such decisions.
- William C. Young (CEO, Plastipak Packaging, Inc) - VP manufacturing  
Manufacturing, distribution, relationships with suppliers
- Royce Slaven (VP, Orchid International) - VP engineering  
Business and Strategic Development experience
- Environmental Lobbyist - Legislative advisor  
Since our product could provide various environmental benefits if implemented by a municipal government, including a lobbyist on our board of advisors could provide the political connections and strategy/advising to accomplish this.

## **Financial Plans (JF,GG,MB)**

Based on our break even analysis, our start up costs will be \$500,000. This value decreases until quarter 2 of our first business year. The analysis shows our maximum decrease of cash flow at -\$30,000. The cash flow is projected to increase past our breakeven point which is at quarter 2 of

year three. This is possible because of our company’s aggressive marketing plan. Also, shown on our break even chart is the cash disbursements is at \$41,000 in year one. Over a 5 year span the cash disbursements decrease in quarter 2 of year three where Trash Tech is projected to break even. At is point cash receipts increase as our product gains market share.

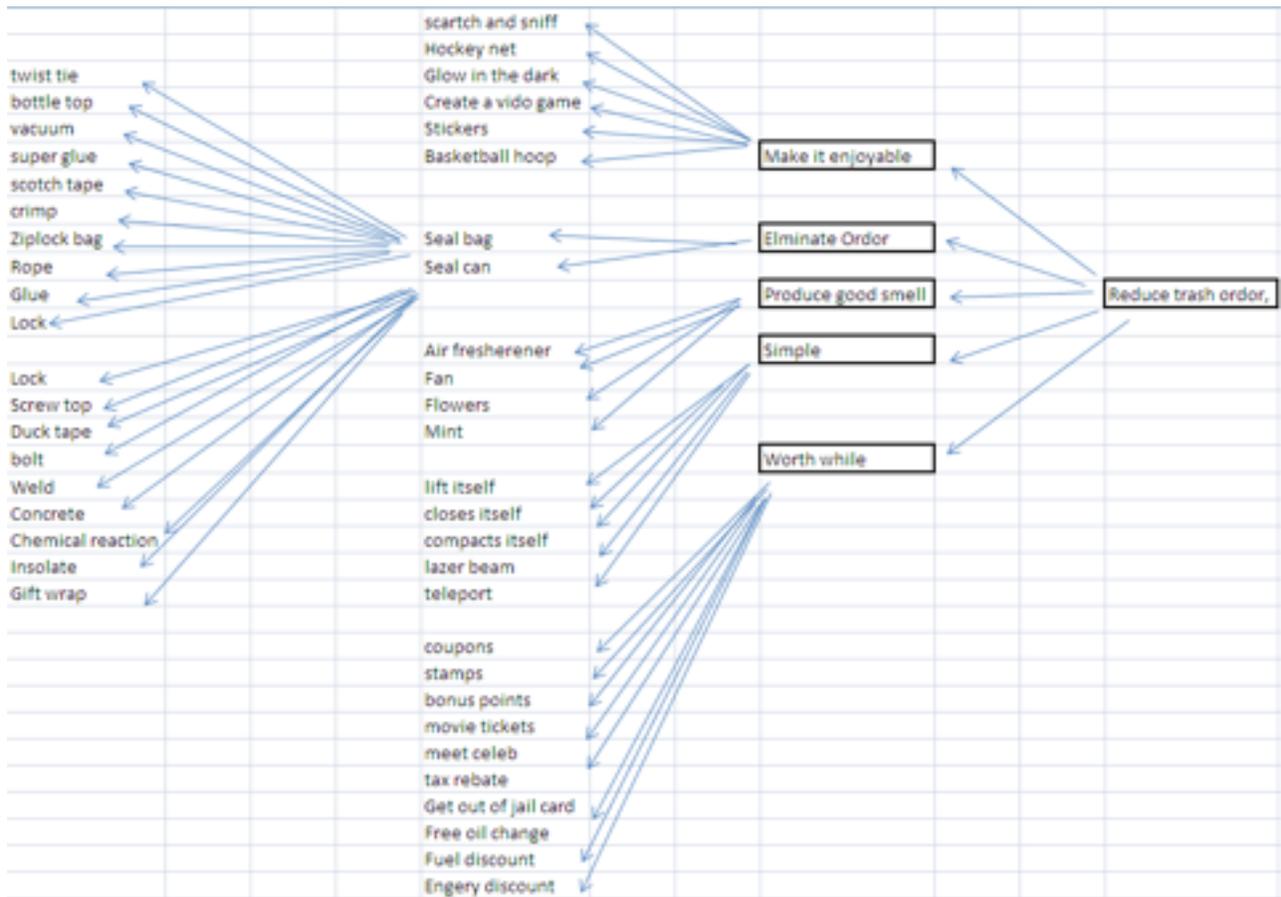


Graph 2: Breakeven Chart (MB,GG MC)

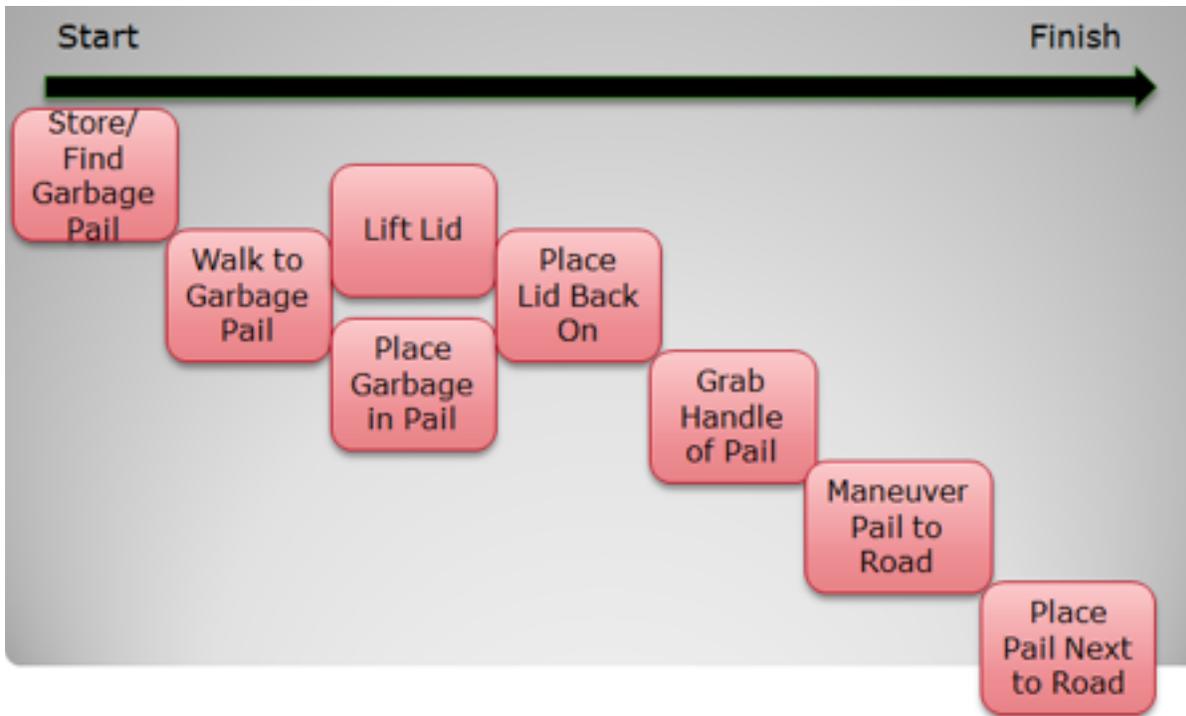
## **Summary: (MB)**

Overall, the space for trash is becoming more of a problem since landfill space is decreasing. The opportunity for growth is huge for large metropolises. Again it will cut down on trash pickups and reduce amount of garbage going into landfills. Once again, we are the best company to tackle this issue. One reason that Trash Tech is the right team for the problem is that we understands odor. Secondly, our aggressive marketing plan places us in a unique position to capitalize on the weaknesses of our competitors. With a connection with Amazon Trash Tech will be able to reach many customers around the United States. As Trash Tech grows we are seeking assistance to grow our business. One area we seek assistance is in networking to build relationships within communities, government, and business organizations. This in return will provide us with key connections to build relationships with cities and government organizations. Second, Trash Tech is seeking assistance with marketing and capital allocation. This is because of our aggressive marketing plans, but we hope to grow into a global brand.

# Appendix A: (MB) Concept Fan



**Appendix B: (MC)  
Function Diagram**



Opportunities:

1. Between the place lid back on and lift lid actions.
  - a. The pail can be lid-less resulting in a rolling foldable lid. This will eliminate the action therefore creating a new sliding action.
  - b. Have a lid similar to the opening for straws in cups that folds in when the trash is thrown in but returns to its normal level after and seals.
  - c. Have an opening on the side of the trash pail that slides open to allow for quick throw out instead of taking the lid off.
2. Pickup opportunities, instead of placing pail near road.
  - a. A trash shoot installed in homes. This will distribute the trash to a central location where it can be transported to a landfill.
  - b. Have the garbage pails robotically wheel themselves to the roadside on preset days.
  - c. Set up a system that has the garbage collectors come get your pail from its storage location.
3. Opportunities in purchasing of garbage pails.
  - a. First pails can be leased or rented with a lifetime/free replacement warranty to protect against damage.
  - b. Another possibility is the sale of a bio-degradable can that can just be tossed out. This will also be beneficial the pail gets lost or dumped.
  - c. Do away with pails all together and make the bags strong enough to replace pails.

## **Appendix C: (GG, MB) DeBono Six Hats Process List**

Blue Hat

Problem: Provide an odorless method to reduce the pain of taking out the trash

White Hat

- Plastic material
- Wheels
- Lid

- Different Color/ sizes
- Handles
- Bags
- Collected once a week at curbside
- Stored outside or in garage
- Blow in the wind
- Light when empty

#### Red Hat

- Don't want to take out the trash
- Distrusting
- Boring/
- Painful/Frustrating
- Pee u
- Surprised
- Dirty
- Revived
- Angry
- Heavy

#### Yellow Hat

- Make product easy to use, and more people will buy our product
- Employees will take pride in the new product quality
- Our new technology will led to the approval of health professionals
- New garbage improvements will provide health benefits to customers and garbage men
- Test drive product will create interest by supplying to cities and businesses

#### Green Hat

- Bright color→ sealant lid→ Handles in the middle of body→Chemical/order less material→ Rollerblade wheels→ Bag less/stain resistant plastic
- Hook with interlocking handles→ Wheels on bottom of body → hinge lid → locking device→ Transparent plastic → Glow in the dark → Reflectors
- Strong/ stable base→ New shape (octagon) → Full detector→ Gage sealer → Bio plastic to bio degrade

#### Black Hat

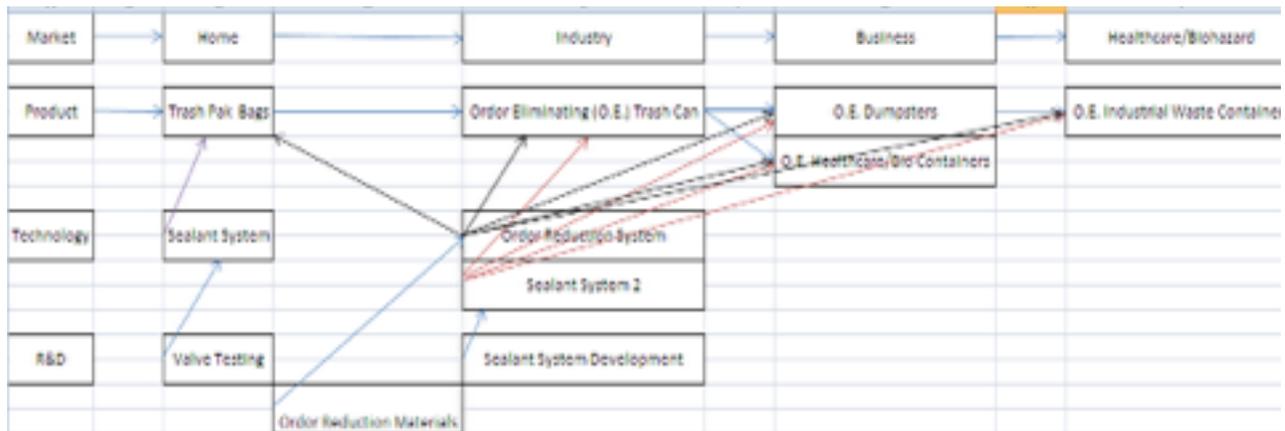
- Expensive
- Safe chemicals
- Easy opening lock
- Heavy/ big
- Stronger
- Wheels more expensive and time to assemble
- Customer support services

### Blue Hat Revised

Product will have: Sealer, reflectors, more handles in middle of body, better stronger wheels, vacuum compacted, and mechanism for wheeling more than two cans.

## Appendix D: (JF)

### Product and Technology Roadmap



## References

"Space Bag® - Triple Your Storage Space - Official Website." *Space Bag®*. N.p., n.d. Web. 10 July 2012. <<http://www.spacebag.com/>>