Addressing food wastage by tracking the expiry date

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We know trash is an enormous problem in the world since trash does not only affect just humans but it also affects living creatures in general. The biggest contributor of trash in the United States is food waste. Food waste is produced by every human and the amounts of food waste is astonishing. Americans throw away almost half of the food that they buy, which is almost worth $165 billion per year. Food waste which end up in landfills and incinerators produces methane which is a greenhouse gas and can contribute to global warming. Trash in general and food waste especially can affect our society in many different ways, it can deteriorate our health, affect our environment and interfere with our lifestyles and unbalance the food chain. There are also lot of indirect loses too, there is lot of energy, money effort and resources that goes into production of food waste.

Our Research

Meeting the Experts: On 09/12/2015 United States Patent and Trademark Office, NOAA, National Waste and Recycling Association, Environmental Protection Agency, Department of Public Works, James J. Spatarella (Institute of Hazardous). We learned much when we went to the Meet the Experts program. We learned about how balloons can be eaten by sea turtles, how plastics can be in the ocean forever, trapping and killing animals. We were taught the top ten things that can be recycled, and much more. We learned a lot about the different types of problems in to do with trash, and this really helped us come up with our problem. We also got to hear from Woodie Flowers, an advisor to FIRST, talk about food waste and the purpose of FLL. On 09/16/2015-- We went to the I-66 transfer station. We learned about what they do to collect different types of trash. Before, in Fairfax County, they threw all the trash into the old landfill.
now helping us produce methane. But now, we burn our trash to ash. We also saw how they dump the trash and push it into bigger trucks so they can be burned. This helped us pick a topic for our problem.

Going to meet these different people and places really helped us come up with a finding a good problem. After debating about the different problems we had, we decided to do our project on food waste.

We conducted a survey to see what different food items are thrown away most. Here are the results in graph form.

Can you confidently say that all the food currently in your house is NOT expired?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Percent</td>
<td>38.9%</td>
<td>61.1%</td>
</tr>
</tbody>
</table>

Are you aware of how much food you throw away?

<table>
<thead>
<tr>
<th></th>
<th>Yes, very aware</th>
<th>No, I'm not aware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>Percent</td>
<td>75%</td>
<td>25%</td>
</tr>
</tbody>
</table>
Most people say that they are aware about how much food they throw away, but after reviewing all the other questions, they still don’t control how much they throw away. The biggest reason that people that throw away food is because of the expiration date. In fact 61% of the people that we gave a survey to said that they can NOT confidently say that all the food in their house is not expired. Not only is the food that is expired thrown away 61% of the people said that they throw away extra food that they have or buy. Many people don’t plan their meals, maybe that is why they are throwing away food. There is a lot of seafood consumer loss which is almost 33%.
We picked food waste as our topic to solve because tons of food is going to waste. In the US, on average 31% of the food available is wasted or thrown away every year. Normally, we waste food because it has either expired, gone bad, or have purchased in excess. Lot of energy and time is spent to produce this food. If we could find a way to reuse the food or prevent the food wastage, then it would save time energy and money in addition to reducing trash. The average American throws away 1,400 calories of food per day, $400 per person per year, which is 40% of the food that is produced in the US. In all, food waste amounts to 31% of the total landfills. Most of the trash around the world is food waste. One in six Americans suffer from hunger, yet still all this food is thrown away. We hope to find a way to reduce food waste.

According to our survey, people know they are wasting food, but are unwilling or unable to do much about it. We hope our solution will help to reduce this waste.

There are few food wastage tracking solutions in the market. One of them (LeftoverSwap) is aimed at reusing the food which has some associated risks, another one (LeanPath) is about tracking the food being wasted for future planning which doesn’t help with current wastage, another one (foodStar) is aimed discounting and reducing the waste but not preventing it. LoveFoodHateWaste aims at efficient use food raw materials of but not prevent the waste.

None of the solutions target household consumer who contribute a big share to food wastage. None of the solutions are affordable to household consumer. None of them are very user friendly for household consumer. None of these focuses on expiry date of food.
For the QR codes to work, the people manufacturing edible goods must cooperate with the idea of sticking a QR code on their goods. We need to create an application that can work with the QR code. There also may be an amount of money that will be needed to promote the application. We must assume that people will be willing to use the application. Also, we have to make it effective and look good.

Our solution

This pyramid shows the waste hierarchy. This hierarchy shows how to get the most advantages, or the least disadvantages, from dealing with trash. The best way to do that is to prevent it, then minimize it, level, disposal. With our solution we chose to hit the minimization level of the waste management hierarchy. Solution aims at notifying the people ahead of time that is about to expire soon, so that they can adjust their meal plan and consume the food soon. Our solution aims at helping consumer to shop wisely by providing data about their food stocks with their expiry dates. This way the solution helps in minimizing food waste going into landfills and incinerators.

We chose to have a QR code on each and every food item packaging. When someone buys a product that can expire they will scan the QR code on the package. There are two ways to scan the QR code. With their phone or their Smart Fridge. Once you scan the QR code, you will know when the food will expire. Eventually, when the date is coming closer your phone will give you warnings that you need to eat that food. You will also scan things if you consume or trash the food. This way the app can suggest a meal plan or to buy less of the food. This would save a lot of food and in our survey most people said...
that they throw away food because it expires. This is our preventive solution towards food waste.

Our solution based on food expiry, is specifically targeted to household consumers, it is affordable very user friendly. It helps consumers plan their meals, optimize their shopping and eventually reduce the food wastage.

1) QR code on food package that contains the item information along with expiration date
2) The app that can scan and register the information
3) App to remind you of the food that are going to expire soon
4) and to track the food thrown away
For our mobile app solution to work with various products and manufactures we propose following standardized data format that will be stored as QR code on product/shopping receipt.

One that goes on product packaging
Product Name| Expiry Date

Eggs | 2015-11-15

One that can go on to shopping receipt
Eggs 2015-11-15#Milk|2015-11-25#Cheese|2015-12-01

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**Benefits:**
The advantages of this idea being made would include, less food thrown away, we will be able to donate more food to feed the poor people less waste, there will be less food waste going to landfills, resulting in a cleaner environment. less money wasted, people will waste less money on food, allowing them to use their money on clothes, and devices. less energy wasted, there will be less energy wasted making food, allowing more energy to be used on other more useful things. less food being made, for example, if you use less corn on food, you can use it on other items like gasoline, adhesives, makeup, and wax. other food items can also be used for other things.

Data Analytics from the app can be used to find, most common food that you throw away, suggest/Recommend meal planner, helps researchers understand the habits of
people. Indirect advantages include it helps manufacturer understand consumer habits on food usage/wastage (demand) and adjust their supply if they help with food wastage situation.”. Grocery stores can use the data from App to predict the user’s usage patterns and integrate it into supply chain to optimize production. They can also do targeted marketing by integrating data with reminder and product promotion services like groupons.

We can also use this solution for medicine. If the medicine has been scanned, the user will get a notification when the product is about to go bad. They can give the medicine to others or use it up before they would have had to throw it away. The same goes for cosmetics.

This solution can also be used in big stores for tracking purposes. When the food is about to expire, the store can move the product to the front, and it can be sold. That will prevent the store from selling already expired food. Also, in the far future, QR code might be able to replace the barcodes and all the printing on the packaging, leaving more space for advertisement and other things.
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