

LAB 1 – Product Description

Lab 1 – Product Description

Refill.Me - Team Iron

John Wasikye

Old Dominion University

CS410

12/12/2022

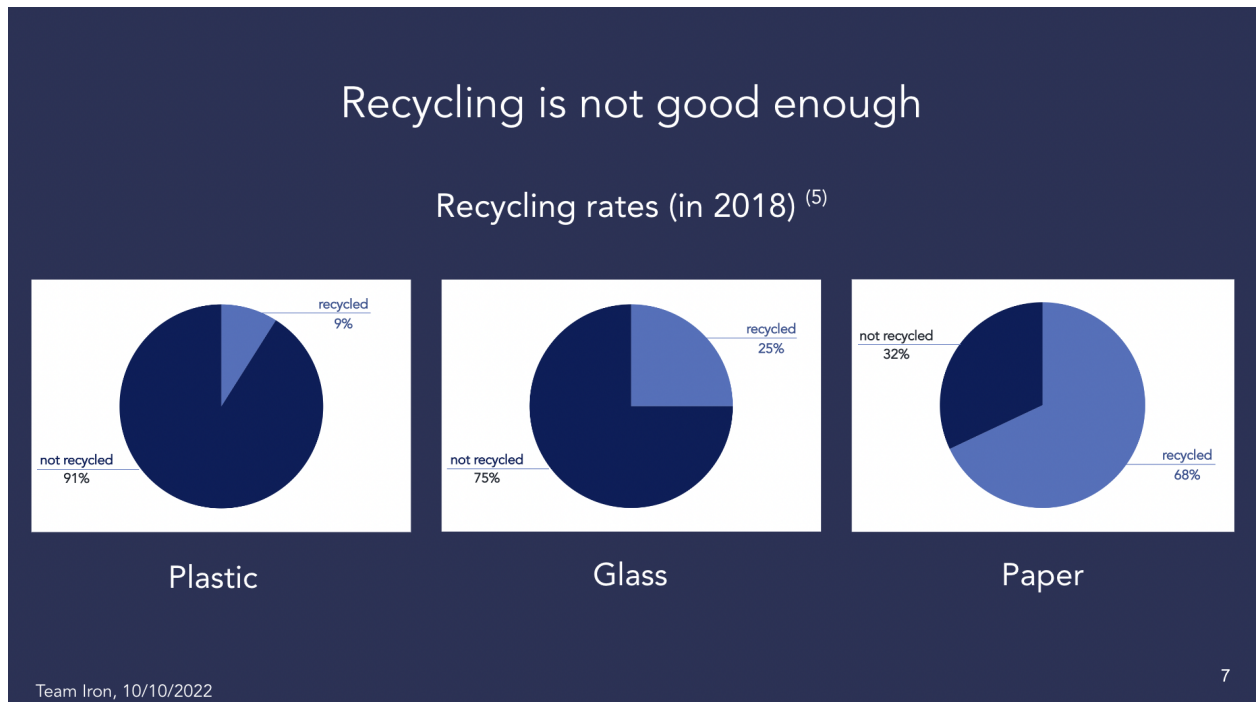
Professor Sarah Hosni

Table of Contents

1. Problem Background.....	3
2. Product Description.....	4
3. Identification of Case Study.....	5
4. Refill.ME Prototype Description.....	6
5. Glossary.....	8
6. References.....	9

1. Introduction

Most food, drinks, and other goods today are provided or bought in some type of packaging. Most of the packaging used for the products consumers buy is made up of either glass, plastic, paper metal or aluminum.(Carvalho) Some of these materials are recycled but a lot of them are not. Containers and packaging make up a very large portion of solid waste, container and packaging combined for added up to 82.2 million tons of waste generation in 2018(EPA). The production and waste of this amount of materials is a major factor in global warming. When plastic and aluminum packaging are made a huge amount of greenhouse gases are released into the atmosphere which directly contributes to global warming. This is because nonrenewable resources are used to make these materials, for example fossil fuels are used to make plastic and in the production of aluminum coal is still widely used at most factories. Some of the material used in most packaging like plastic and glass cannot be recycled back into the environment because they do not biodegrade. Materials like this are put back into the environment and pollute.



LAB 1 – Product Description

In the past we have looked at recycling as a widespread solution to packaging waste, however if we look at the percentages of this waste that is recycled, we can see it is not a solution to packaging waste. As shown on the figure above not enough of plastic, glass or paper is recycled. Packaging waste is a major problem that will have lasting effects on the environment if not addressed. Refill.Me is our solution to this problem to significantly reduce packaging waste by supporting package free shopping.

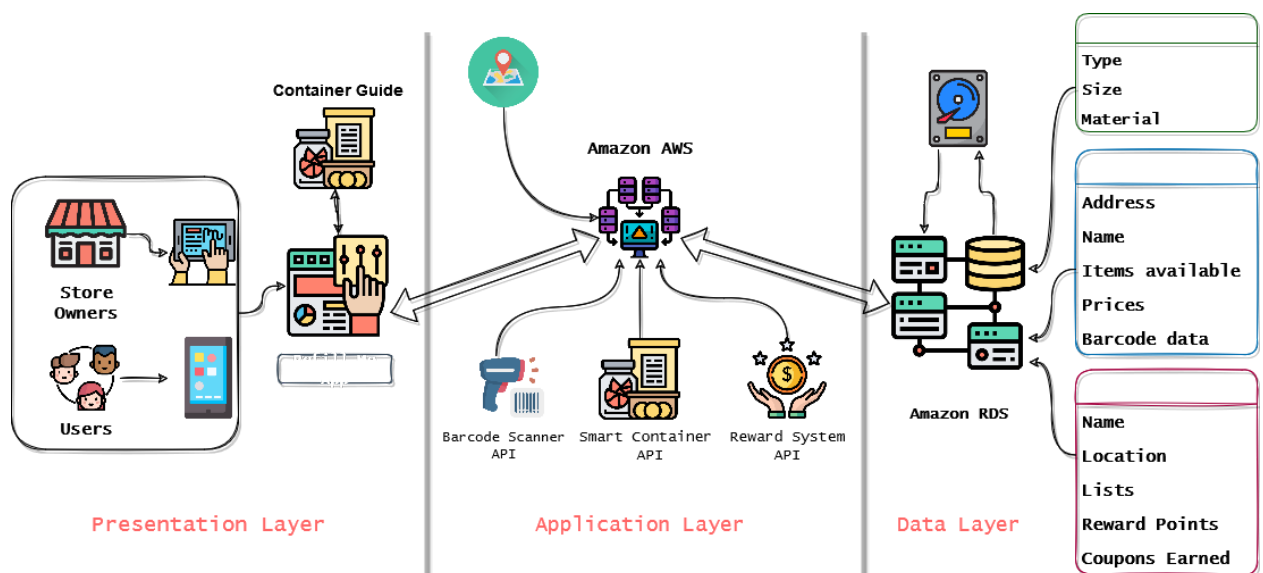
2. Product Description

Refill.ME is a mobile application made for shoppers who want to participate in package free shopping. The application will have a version that is optimized for shoppers as well as a version that is optimized for tablets for the store owners. The goal of Refill.ME is to connect package free shoppers with package free stores, and reduce packaging waste. This will help people who are interested in package free shopping but do not have information on what stores around them offer package free options as well as what products the individual store offer package free. Refill.ME will help both novice package-free shoppers as well as experienced package free shoppers maintain their shopping habits. This application will support local businesses by giving them a new way to connect with their package free shopper base. Refill.ME will provide practical information regarding package-free shopping. This application will also collect data to help store owners optimize their offerings for package-free shoppers. The application will keep users engaged by having a reward feature called Reward.Me that will enable shoppers to collect points for package-free purchases and use these collected points to redeem certain benefits, which will depend on the store.

The key features offered by the application to the customer will be a container guide, container recommendation, shopping List and Reward.Me. It will give customers

LAB 1 – Product Description

the ability to search by icon, scan barcodes or enter the product name. The feature Refill.Me will offer store owners include, product and price dashboard, reward point conversion, coupon dashboard, store rating, store analytics, store search, and product search. The store owner will also have the option to search by icon, scan barcodes or enter the product name.



ReFill.ME will have a three-tier architecture. Firstly hardware, which for shoppers will be mobile phones and for store owners a tablet. The application layer will have a web server, and we will integrate various API's which will link with the database. The data layer will have relational tabs for storing store, product, and user information as well as relational tabs for data analytics.

3. Identification of Case Study

Refill.MEs' main customer base will be eco-conscious shoppers. These shoppers will range from Gen Z to baby boomers, who are highly educated and from diverse income levels.

LAB 1 – Product Description

The customers will be from mostly from the east and west coast of the United States, where most package-free stores and shoppers are found. The stored Refill.Me will target include supermarkets with bulk sections, package-free stores and farmers markets. Shoppers will use Refill.Me to search for product, store and container information. Shoppers will also use Refill.ME to create shopping lists as well as collections as redeeming rewards from Reward.ME. Store owners will use Refill.ME to display package free products and their prices to customers, increase their digital presence and get the search information from customers in their area. In the future we hope grocery shopping apps as well as trucks that sell package-free products on the go can use Refill.ME.

4. Refill.ME Prototype Description

4.1 Prototype Architecture (Hardware/Software)

4.1.1 Hardware

4.1.2 Software

4.2 Prototype Features and Capabilities

4.3 Prototype Development Challenges

5. Glossary

Biodegrade: to decompose and become incorporated back into the environment

Bulk section: an aisle where products are available in dispensers or bins, and the shoppers can buy the exact amount they desire

LAB 1 – Product Description

BYOC (Bring Your Own Container): an initiative to encourage shoppers to bring their own containers with them to the store in order to avoid creating packaging waste

Compostable: breaks down into organic matter and does not produce any chemicals during that process

Container: tote bags, produce bags, glass or plastic jars, glass or plastic boxes, glass or plastic bottles that can be used for package-free shopping

Container Guide: a small lexicon providing an overview of different types of containers and the types of products that could be stored in them

Container Recommendation Feature: a feature of Refill.Me that suggests specific containers for products based on the type of product such as liquid or solid.

Experienced package-free shopper: a shopper who has experience, and thus, knowledge of package-free shopping

Farmers' market: a market where local farmers sell their products directly to consumers.

Greenhouse gas emissions: gasses that trap heat in the earth's atmosphere such as carbon dioxide and methane, and thus directly contribute to climate change, predominantly emitted through human activities

Loose product: product sold without any packaging

Mainstream grocery shopping: grocery shopping that does not follow sustainable practices, thus, it entails buying packaged items, using plastic, not considering environmental aspects

Microplastics: tiny plastic particles that are less than five millimeters long and are created when larger plastic pieces breaks down

Novice package-free shopper: a shopper who has no experience, and thus, no knowledge of package-free shopping

LAB 1 – Product Description

Package-free: without any packaging materials such as plastic, paper, cardboard, aluminum, or glass

Package-free store (in the context of our application): supermarkets with a bulk section, stores exclusively selling loose products, and vendors at farmers' markets.

Package-free shopper: a shopper who prefers to buy loose products by filling them into their own containers

Package-free shopping: shopping using one's own containers, thus, shopping without creating packaging waste

Packaging: material used to protect a product from any damage during transportation

Produce bag: a reusable bag usually with a window and tare weight label that is used for buying fruits / vegetables

Single-use: designed to be used only once, and then to be discarded

Tare weight: the weight of an empty container that should not be included when the price of the product is calculated

Tote bag: a large bag, often made of cotton, used to carry many items

6. References

- Carvalho, J. S, et al. (2022). Consumers' knowledge, practices, and perceptions about conventional and sustainable food packaging, *Food Science and Technology*,
<https://www.scielo.br/j/cta/a/RcixMbZXFTTtgfjrpCvjvtB/?format=pdf&lang=en>
- Denis, K. (2021, August 7). The Future Is Bright for American Recycling, *Consumer Brands Association*,
<https://consumerbrandsassociation.org/blog/the-future-is-bright-for-american-recycling/>
- EPA. (2022, March 8). Containers and packaging: Product-Specific Data, *United States Environmental Protection Agency*,
<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific#:~:text=Containers%20and%20packaging%20make%20up,beverages%2C%20medications%20and%20cosmetic%20products>
- EPA. (2022, July 31). National Overview: Facts and Figures on Materials, Wastes and Recycling, *United States Environmental Protection Agency*,
<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#NationalPicture>
- Groh, K. J. et al. (2019, February 15). Overview of known plastic packaging-associated chemicals and their hazards, *Science of The Total Environment*, Volume 651, Part 2,
<https://www.sciencedirect.com/science/article/pii/S0048969718338828>
- Hoover, A. (2022, June 10). These influencers live trash-free in a garbage world, *Morning Brew*,
<https://www.morningbrew.com/daily/stories/2022/06/10/influencers-live-trash-free-in-a-garbage-world>

LAB 1 – Product Description

Kim, L. Incentives, Demographics, and Biases of Ethical Consumption: Observation of Modern Ethical Consumers, *University of California*,

https://www.econ.berkeley.edu/sites/default/files/Kim_Laura_F18%20Honors%20Thesis.pdf

Shen, M. et al. (2020, May 1). (Micro)plastic crisis: Un-ignorable contribution to global

greenhouse gas emissions and climate change, *Journal of Cleaner Production*, Vol. 254,

https://www.sciencedirect.com/science/article/abs/pii/S0959652620301852?casa_token=U8PV0S4NpoAAAAAA:7XiABOjdLWumEZeQDV6XHsiGVwlopPMLtaBUirG-IUehwszg7wIX-Lm0VIcgrQ-4aBVxHwTHa4w

Sinai, M. (2017, June 27). How Many Times Can Recyclables Be Recycled?, *Recycle Nation*,

<https://recyclenation.com/2017/06/how-many-times-can-recyclables-be-recycled/>

The Environmental Impact of Food Packaging. (2018, October 08). *FoodPrint*,

<https://foodprint.org/issues/the-environmental-impact-of-food-packaging/>

VanRemoortel, A. (2018, May). Cultural Capital Among Zero Waste Consumers, *Wheaton College*,

https://digitalrepository.wheatoncollege.edu/bitstream/handle/11040/24562/Anna_VanRemoortel_HonorsThesis.pdf?sequence=2&isAllowed=y

Zero Waste Packaging Market Size, Share, Report 2022-2030. *Precedence Research*,

<https://www.precedenceresearch.com/zero-waste-packaging-markethttps://www.precedenceresearch.com/zero-waste-packaging-market>