Green Grain

Waste-free Made Easy

A System Designed to Reduce Food Packaging Waste

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RESUMO

O objetivo desta tese é desenvolver um sistema de compra de alimentos com desperdício zero e projetar uma marca que fosse um espelho desse ADN verdadeiro. Em última instancia, esta tese espera encontrar uma solução inovadora para reduzir a quantidade de embalagens descartáveis de alimentos que se tornam resíduos ambientais prejudiciais. O Design Thinking e a investigação ativa foram as metodologias que orientaram o projeto. Entrevistas, observações de sites, e questionários foram alguns dos métodos utilizados nas fases de inovação, iteração e produção. O teste de validação utilizou uma apresentação com uma recolha de dados quantitativos e qualitativos. Os dados foram analisados e reforçaram o sucesso tanto da marca, como do sistema inovador, que oferecem uma real, e percebida, mais valia para o ambiente.

ABSTRACT

The objective of this thesis study is to develop a zero-waste system of buying food and to design a brand that reflects that honest approach. Ultimately, this thesis hopes to find a

new and innovative solution to reduce the amount of one-time-use food packaging that becomes harmful environmental waste. Design thinking and action research comprised the methodologies that guided the project. Interviews, site observations, and polls were also included in innovation, iteration, and production. Validation testing utilized a presentation and survey with both quantitative and qualitative results. The data collected reinforced the success of both the brand and the innovation in offering real and perceived environmental value.

KEYWORDS

Environmental, Graphic Design, Packaging, Ecological, Sustainability

PALAVRAS-CHAVE

Ambiental, Design Gráfico, Embalagem, Ecológico, Sustentabilidade

INDEX

1. THEORETICAL FRAMEWORK

1.1 Introduction

We are standing at the brink of global collapse. As we sit in our office chairs, ride the metro, cook dinner, and turn on our TVs, we are blissfully caught up in our personal lives. Perhaps it seems easier to turn a blind eye than to face reality. Individuals may ignore it; media outlets and politicians and businesses and whole governments may ignore it, but the terrifying truth is that we are all sitting on a ticking time bomb. The longer it's ignored, the likelier it will be that those businesses and organizations will fail to exist all together. As we go about our daily lives, how many of us stop and think about how all of this – our way of life, our friends and families – could all come crashing down? The simple fact is that the earth cannot sustain its current state of human population. The exponential amount of waste that ends up as pollution in our environment presents a crucial problem that this thesis hopes to tackle. In order to make amends for my past job at a major oil company, I chose to focus my thesis research on environmentally sustainable packaging design.

1.2 Theme and Problematic

The issues of packaging waste, pollution, and global warming threaten our way of life, our environment, and all species that call earth home. The planet is more overpopulated than ever, and the current population uses 50% more resources than the environment can even provide (Scott & Vigar-Ellis, 2014, p. 643). Not only do we harvest more resources than the earth can produce, but also, as a species, we destroy and change existing lands, leaving them even less productive for the future (Dougherty, 2008, p. 29). In producing and consuming "stuff," a large amount of pollution accumulates on our planet – from smog, to greenhouse gases, to the Great Pacific Garbage Patch. The problem with this accumulation is that it constantly grows, leaching toxic chemicals in the process and killing wildlife, thus disrupting the entire global food chain. Eventually, this results in human diseases such as cancer and respiratory problems, as well as natural crises like climate change and shortages of food and clean water.

1.3 Goals

The purpose of this study is to identify, develop, design, and brand a waste-free system of buying food. The research and the project aim to improve the design process by minimizing environmental impact and maximizing human utility. Ultimately, this thesis hopes to find a new and innovative solution to reduce the amount of one-time-use food

packaging that becomes harmful environmental waste. The exponential growth of trash on our planet leads to disease and death, not only of wildlife and nature, but also of humans. Innovation and better design could offer hope.

1.4 Research Questions and Hypothesis

Most current types of packaging are bad for the environment, and despite efforts to keep waste well-managed, some materials will inevitably end up in our ecosystem. This thesis looks at a number of questions that aim to solve this problem: 'How can packaging be re-designed to be eco-friendly?,' 'How can packaging and branding design make actual eco-friendliness more apparent so that people can make better purchase decisions for the planet?,' 'How can designers deliver honest messaging about a brand's eco-friendliness?,' 'How can a package's design encourage recycling and/or re-use?,' and 'How can a food brand and its package design convey a clear message of its positive environmental impact?' Throughout this paper, the proposed innovation and branding strives to solve the problem of packaging waste. Therefore the aim of this thesis is to prove, or refute, the hypothesis that it is possible to create a brand of food packaging that is truly ecologically friendly and is perceived as such by consumers.

1.5 Methodology and Research Planning

In addition to a Literature Review on the subject of eco-friendly packaging design, this thesis relied on an applied research methodology that took place alongside the project's design process. Through practice-based research, the investigation informed the production of the project (Muratovski, 2016, p. 192). Action research improved the initial innovation through stakeholder participation and a non-linear cycle of planning, producing, observing, and improving. This cyclical process can be seen in the following chart.

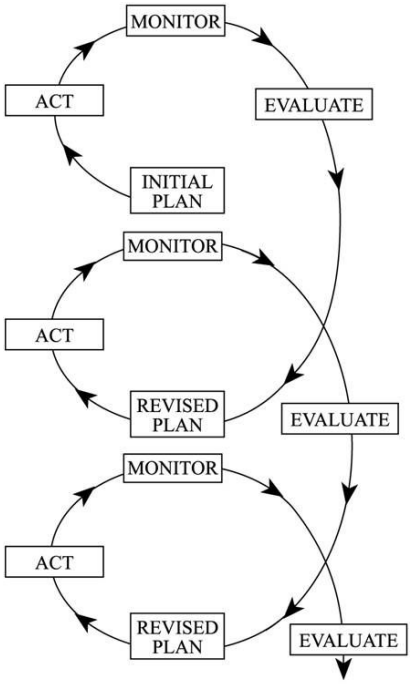


Diagram 1

Like most action research, the subject matter was set in the improvement of a social practice; in this case, the problematic practice was the design and production of ecologically-harmful food packaging. In order to create a human-centered design, participation from stakeholders was crucial. A number of interviews were conducted during different periods of the design process in order to evaluate the design and make effective revisions. The core audience of eco-friendly consumers made up the basis of participants, while the broader public offered input in both polls and the final validation survey. Co-design allowed form to successfully follow function. Participants' input greatly contributed to decisions about each step of the design process. Working in this manner bettered the design process by improving and strengthening the client-designer relationship. Action research also encompassed the design of systems, allowing for greater and more comprehensive innovation in problem solving. As defined by Muratovski, "action research should be participatory in character; it needs to have a democratic impulse; and it should contribute to both social science and to social change." (Muratovski, 2016, p. 196)

1.6 The Project

In the action research contained in this thesis, data collection and analysis reflected and meshed with the design process of the project. Both followed a non-linear pattern

because they involved the repeated review and analysis of the problem and proposed solution. As in all applied research, purpose, context, and rationale were the three factors that lead to and supported the creation of an artifact; in this case, the completed project. Finally, perceptions of eco-friendliness, brand success and product viability were all tested during a validation session that included the collection of both quantitative and qualitative data in the form of a survey. The contextual research plan was set up in Table 2 in the Appendix.

1.7 Summary

In this paper, my research is laid out in a Literature Review section, followed by an explanation of the project and action research methodology, then validation and results analysis, conclusion, limitations, and suggestions for future research. Firstly, I explore and identify the aspects that define sustainable packaging design. The Literature Review section also includes the presentation of studies on the subject of consumer perception of eco-sustainability in products and packaging. Next, the Project section explains the design thinking and action research process of developing and testing my innovation and brand. The data collected during validation is analyzed in the Results Analysis portion. Finally, the Conclusion addresses the validation of the hypothesis and offers reflections, limitations, contributions, and suggestions for future research.

2. LITERATURE REVIEW

2.1 Introduction

Designers play a special role in contributing to unnecessary ecological damage. We devise solutions that make or break the environment we live in; and, with some thought, our expertise could even help to design better overall systems. Paper makes up 81 million tons of solid waste each year and accounts for 40% of trash in the US. In the United States alone, designers spend $9.1 billion USD annually on paper. By making more responsible choices about the details – materials, inks, and production processes – graphic designers can make a difference in preserving the environment and sustaining life as we know it (Design Can Change, Answers for Designers, p. 3). Better yet, by producing better design with more effective results, and by looking into whole-system innovation, serious amounts of waste could be avoided. For instance, most direct mail – a shocking 97.4% of it – immediately turns to waste. If mailer designs were more efficient at reaching the correct audience and achieving the goals in mind, a large amount of this waste could easily be avoided (Dougherty, 2008, p. 39). This Literature Review looks at the environmental problems, large and small, that could be solved with better graphic and packaging design.

2.2 Theory

Every package designed ultimately reaches one of five possible destinies. The worst outcome for a package is litter, either on land or in the ocean. Plastic materials left in the open can take 450 years to decompose. Landfills offer a slightly better solution, since they are somewhat managed and remain in one place. However, hazardous waste landfills become the expensive graves for many materials such as laminated paper, metallic inks, and various types of plastics. Burning of waste can sometimes provide an energy source, but it can also lead to hazardous gas emissions (Dougherty, 2008, p. 53).

Composting provides a theoretically eco-friendly alternative. However, bioplastics, or compostable plastics, simply lack the infrastructure to handle their waste streams. Although new biodegradable plastics present a hopeful solution to the planet's waste problem, they are not yet viable because they require industrial-scale composters in order to decompose. These facilities are very few and far between. At the present, biopolymers only fit into the number 7, or "other," category of recycling, so few things can be made from them. Marketing these items as biodegradable is a form of greenwashing because the average consumer may believe that these bioplastics are easily compostable in any household garden. The other major problem that bioplastics present is the reduction of

agricultural land. For example, growing corn for the production of biopolymers takes up valuable land that could be used for cultivating human food (Boylston, 2009).

The next best destiny for a designed package is to enter the recycling stream. Recycling allows the materials to maintain value and potentially continue use indefinitely. Other materials, however, lose structural integrity and purity the more times they are recycled. Coatings and inks must be removed during the recycling process, and this can create pollution problems and waste extra energy (Boylston, 2009).

Re-use presents the best possible end-of-life solution for packaging. When re-used, materials retain their full value while significantly cutting their ecological footprint. By using a package just twice, its environmental impact drops by half. This number can fall to mere fractions with continued use. Breweries in Canada already employ a successful bottle take-back system. On average, the bottles are used 15 times before being recycled, and the return rate is higher than 95%. It's a win-win: the companies save production money and the environment (Boylston, 2009). As a material, glass offers a durable model with high persistent value. On the other hand, plastics originate from non-renewable oil and gas resources, require toxins in manufacturing, waste fossil fuels in processing and transport, take hundreds of years to break down, and are used only ephemerally. Keeping all of this in mind, this thesis aims to solve the packaging waste problem by focusing on reuse of durable materials.

2.2.1 What Makes a Package More Environmentally Sustainable?

Many factors must be considered throughout a product's packaging design process. The package's major roles are to maintain the product's value until consumption and to reduce product waste (FDF, 2017). Primary, secondary, and potentially additional functions of the item must be defined and aligned with the user's characteristics, profile, and needs. The design criteria include the qualitative measures of user experience, appreciation, and enjoyment; and the quantitative values of quality, lifespan, number of components, and number of uses. Some technical aspects of the package that must be taken into account are strength, durability, production, assembly, and transportation. Other important considerations in the design process include visual, semiotic, security, ergonomic, performance, regulatory, and communication concerns (PAC, 2012).

The package must also meet a high number of functional requirements. It has to contain, protect, preserve, improve logistics, facilitate handling, inform, and promote. The design of the package should take into account transportation methods. Usually, the

primary package is grouped into secondary and then tertiary containers such as pallets or crates (FDF, 2017). The package must also fit legal requirements on regional, national, and potentially international levels. This often includes health and safety concerns such as contamination, risk of spill, tamper protection, and risk of injury from package use (PAC, 2012).

Environmental sustainability can be defined as a method of development that can indefinitely support human and all other forms of life present on our planet (Tang, 2014, p. 2). The properties of an eco-sustainable package include green production practices and energy sources, health and safety for end users and communities throughout its lifecycle, use of renewable or recycled source materials, physical optimization for reduction of materials and energy, and sufficient recovery or inclusion in cradle-to-cradle cycles (Lockheed Martin, 2010). An environmentally responsible package requires even more performance evaluations than a conventional package in the areas of carbon and water footprints and lifecycle analyses (Tang, 2014). The designer must design to reduce excess packaging and energy demand.

For single-use packages, transportation must be seriously considered. Transport and logistics calls for a package that is efficient in weight, volume, handling, and stackability (PAC, 2012). The size and shape of the product provides functionality not only for the end user, but also for the stages of manufacturing and transportation. The material weight needs to be as low as possible relative to the product weight (Cass, Flynn, Hong, & Rosseter, 2011). More efficiently designed packages could result in huge environmental gains. Cutting down on the number of transport trucks, creating smaller or fewer loading docks, and maximizing product and truck-filling-times saves land, energy, fuel, and clean air (FDF, 2017).

The package's design needs to find a balance between minimizing materials used and improving the hygiene, safety, and protection of the product. Less materials can be used by modifying the volume per unit sold, considering bulk, or increasing portions. Another way to increase the package-to-product ratio is to fill containers as full as they can be without compromising structure or durability (Lockheed Martin, 2010). Reducing additional materials such as plastic wrap and adhesives increases a package's ability to be recycled. In fact, glue renders most packages nearly impossible to be recycled; therefore, it should be avoided as much as possible. The package must be physically strong enough to contain, secure, and stack well. Cushioning, shock absorption, and damage prevention are also necessary at this stage (FDF, 2017).

An important factor to consider is the package's "*float*," or its ability to keep the product at a distance from the sides of the container with as little movement as possible. Package damage leads to product loss, and product loss contributes to environmental repercussions. Impairment usually takes place as a result of blunt force, but products also face continuous vibration throughout transport (Lockheed Martin, 2010).

The barrier properties of the material ought to at least contain the product, and in some cases, also protect it from oxygen, light, or other chemicals present in the packaging itself. The materials should not change the contents of the package by adding any unwanted odors, colors, or unhygienic aspects. Recycled materials offer a potentially eco-friendly solution, but they come with their own set of problems. The benefits may sometimes outweigh the setbacks, but research must be made into the specific material and how much energy and greenhouse gas emissions are required to recycle it. Recycled packages may also require more material than traditional packaging in order to maintain durability. In terms of food containment, recycled packaging must follow all applicable regional and national food contact legislation. The design should take into account the package's end of use, and if returnable, minimize space in transport and facilitate an easy return process (FDF, 2017).

The materials need to be selected based on their ecological sustainability. In order to measure environmental impact, each of the following factors must be taken into account: eco-toxicity, climate change, ozone depletion, smog creation, water eutrophication, fuel and energy depletion, and effect on human respiratory and oncological health (White, 2009, p. 15). The eco-friendly packages should make use of as few materials and components as possible while maintaining functional and structural integrity. The packaging should be strong and stack well, so as to minimize the need for extra protective materials and secondary and tertiary packaging. If packages are robust enough and can be easily cleaned by the end-user, their ability to be re-used or re-filled greatly extends their functional life (Design Can Change, Sustainable Design Checklist).

Where used, paper should include a high percentage post-consumer waste (PCW) stock, and paperless options must also be considered. Paper needs to be small and light in weight, produced with renewable energy with a Green-e certification, FSC-certified, and chlorine-free (Design Can Change, Your Studio is Filled with Ways to Make a Difference) Uncoated or satin papers are generally easier to recycle than coated papers (Boylston, 2009). Reducing or eliminating adhesives is also important in reducing toxicity.

Inks should be vegetable-based; soy ink is a common alternative to harmful oil-based counterparts. Other ecologically damaging inks include fluorescents, metallics, and shades of dark purple, dark blue, and red, since there are especially difficult to de-ink in the recycling process (Green, 2007, p. 64). Ink coverage, especially large areas of solid color, are avoided. Whenever possible, printing directly on the package replaces the use of labels. Inks should not require a protective surface coating. Die-cuts and embossing are favored over additional ink because they present a more eco-friendly alternative. On the other hand, foilstamping, thermography, and lamination create additional environmental problems and should be avoided (Design Can Change, Sustainable Design Checklist). The printer also has to have a responsible waste management system and environmental certification (Design Can Change, Your Studio is Filled with Ways to Make a Difference).

Choosing the right companies for the production process makes all the difference in ensuring an eco-friendly package. Whenever possible, suppliers ought to be chosen based on their proximity to the job being created; local is best. Printing methods should be waterless or digital because offset printing leaves behind waste water containing high quantities of *volatile organic compounds*, or VOCs. Waterless printing requires no dampening solution, producing no wastewater. Images are often crisper using this method, and less paper is wasted because high quality levels are reached more quickly. Digital printing offers singular prints rather than unlimited runs, which saves paper waste. Cleaning the machinery of a digital printer does not require harmful chemicals, and the inks themselves are safer than those used in offset printing (Green, 2007, p. 65). Simply put, each design decision must address the entire lifecycle of the product from material extraction to end-of-use.

A good package should function well and be easy to use, reseal, handle, and understand. The closure and re-closure has to operate easily and properly for at least the necessary and expected use of the product. It cannot deteriorate at all throughout the product's lifespan, and for food products, tamper evident features can provide a key element of safety. An ecological design also minimizes *Unintentional Product Residue*, or the remaining product stuck within a package.

In order to be considered fully environmentally sustainable, the messaging and symbols need to be clear and concise. Consumers should be able to easily understand how to best use the package, and how to responsibly recycle or dispose of it after use. Material identification symbols, recycling symbols, and the package's color can make it

easy to sort. If compostable, the messaging should clearly state how to handle it so that it doesn't enter into the normal recycling or waste streams (FDF, 2017, p. 14).

Lastly, and most pertinent to this thesis, an environmentally sustainable package needs to appeal conceptually and visually to the user, and prove easy to use. The packaging system has to contain a clear message that is honest, transparent, and complete while conveying the environmental benefits of both the product and the packaging. The marketing should appeal to the right audience (PAC, 2012).

2.2.2 What Makes a Brand Appear Reliably Eco-friendly?

One solution that may aid efforts to preserve our planet and create less waste is to increase environmental literacy worldwide. Although consumer awareness is increasing and concerns about eco-friendly packaging are influencing purchase decisions, many people find green marketing and environmental claims confusing and don't know what to trust (Scott & Vigar-Ellis, 2014, p. 644). Education provides one avenue through which to impart truthful knowledge about the ecological impacts of packaging, but the packaging itself plays a crucial role in conveying honest information. Labels help consumers remember and understand the consequences of their purchase decisions. Clarity and honesty in labels is integral to increasing environmental sustainability and reducing the poor effects of 'greenwashing,' a marketing strategy that coerces buyers with false claims of eco-friendliness (Magnier, Schoormans, & Mugge, 2016, p. 139).

In order to determine which package performs best in terms of eco-sustainability, people generally rely on a number of visual cues at point-of-sale. According to Scott and Ellis in a 2014 study on the subject, gender and age do not factor into consumer understanding of green packaging (Scott & Vigar-Ellis, 2014, p. 645). The most significant indicator for buyers is the wording on the label, followed by the logos and certification symbols, and finally, the materials used. Scott and Ellis' study also identified certain colors that people associate with environmentally responsible products. These shades include earth tones such as browns, greens, and creams (Scott & Vigar-Ellis, 2014, p. 646). Brands that typically employ bold, bright colors generally mute and lighten their palette for more natural or ecologically sustainable lines of products, with favorable reception despite the departure from their typically used brand colors (Baik & Suk, 2010, p. 3). Scott and Ellis also noted that plain packages, and those with few inks, are seen as more eco-friendly. However, 12.4% of respondents in their study failed to notice any difference at all between the green packaging and its conventional counterpart (Scott & Vigar-Ellis, 2014, p. 646).

Visual indicators can increase environmental literacy and trust in green product claims. Since all design and marketing appeals to both emotional and functional dimensions, eco-friendly packaging can successfully express environmental responsibility by creating positive emotions with nature imagery or the color green (Binninger, 2015, p. 253). Organic food packaging, though not necessarily eco-friendly, often employs hand-drawn or calligraphic typography to convey a sense of naturalness. Illustrations also function in the same manner, providing a human touch that aligns with organic shapes to appeal to environmentally aware consumers (Baik & Suk, 2010, p. 4). Inclusion of an animal logo or mascot appeals to children, and in turn, could coerce parents into making more eco-friendly purchases. Additionally, environmental certification labels need to come from well-known organizations in order to garner trust.

Consumers also want to know information about how their buying habits create direct positive effects on their lives, society, and the environment. Text should be included regarding green packaging, words that tell a positive story about the package and the consequences of disposing of it properly rather than irresponsibly. Simple, clear, and honest language can increase consumer trust. The specific words 'recyclable,' 'biodegradable,' 'non-harmful,' – if true to the specific package – have been shown to be the most effective in conveying understanding of a package's eco-friendliness (Scott & Vigar-Ellis, 2014, p. 647). In addition to these key words, the environmental information must be tangible, quantifiable, and educational. In China, green purchase intention and perceived credibility depend on the specificity of a company's claims and the relevance of these statements to daily life (Kong, Harun, Sulong, & Jaratin, 2014, p. 929). The ingredient list also needs to mirror the company's claims; that is, food products must contain only natural ingredients in order to reassure the buyer (Binninger, 2015, p. 253). Claims of healthiness influence purchase intention even more than environmental messaging (Binninger, 2015, p. 256).

Consumers generally associate eco-sustainability with quality. However, this association varies depending on the type of food product. Foods such as junk foods that have short-term pleasure, but longer term negative effects can be referred to as *vice* foods, while healthier foods that may be less enjoyable in the moment, but provide long-term benefits can be called *virtue* products (Magnier, Schoormans, & Mugge, 2016, p. 133). Studies show that for virtue foods, perceptions of quality increase with perceptions of eco-friendliness. The case with vice foods is much more complicated and consumers sometimes choose conventional packaging over more ecologically responsible options,

perhaps because they think that these brands will taste better. If the environmental sustainability of the food product itself is already high or if it is organic, then the eco-friendliness of the packaging surrounding it will not make much of a difference in perception of quality (Magnier, Schoormans, & Mugge, 2016, p. 133). This study hopes to use this knowledge about consumer perception of green packaging to produce a packaging system and brand that appeals to users.

2.3 Summary

Innovation and eco-friendly design could offer a potential solution to the problem of packaging waste. In order for a package – especially a single-use package – to be considered environmentally sustainable, it must conform to best fit production, transport, and end-of-life. Eco-friendly packaging design optimizes the balance between minimizing materials used and maximizing protection of the product. Designers must also take into account the environmental impact of the package's material, production, and printing. Every package ultimately reaches one of six possible destinies: litter, landfill, incineration, composting, recycling, or re-use. Of these, re-use presents the best possible outcome for the environment. Therefore, the Project section of this thesis focuses on the re-use of durable materials. In making green purchase decisions, people must rely on visual design and communications. Studies indicate a number of visual cues that help consumers determine the eco-friendliness of a package. These include messaging, colors, materials, typography and imagery styles, and certifications. In order to present a viable green package, visual design must work hand-in-hand with packaging and systems design.

3. PROJECT

3.1 Introduction

The research problem highlighted in this paper is dire, yet simple: packaging creates waste that is damaging for the environment. It can be summed up in the following research question: How can packages be re-designed to reduce waste? The methodology explained in this section aided in clarifying and solving this question.

The underlying assumptions of the research are that most people buy food that they cook at home, and most follow traditional systems of buying and storing groceries. In turn, these systems result in lasting environmental damage. The majority of consumers visit grocery stores, buy foods based on a number of factors such as price, preference, and brand loyalty, and choose either paper or plastic bags at checkout. Once home, plastic bags are generally thrown out, food is stored on shelves or in a fridge or freezer, and when cooking, the outer layers of packaging most often go into the trash. In the United States in 2012, only 34.5% of all municipal solid waste was recycled (EPA, 2014, p. 2).

This system of buying, using, and discarding creates packaging pollution, which is harmful to the environment in a number of ways. Extraction of raw materials creates a carbon footprint and leads to waste of natural resources, land, and energy. Processing materials to be turned into packaging releases harmful compounds and uses even more energy. Next, transport of these packages creates air pollution, adds to greenhouse gases, and uses up fossil fuels. Grocery stores produce waste from secondary packaging. Consumers generate an endless stream of trash that leads to ocean pollution, landfills, and chemical leaching of known carcinogens.

3.2 Theoretical and Practical Contributions to the Project

In order to solve this immense problem of waste, a systemic change must take place. In designing a potential solution, the type of research necessary can be identified as exploratory and descriptive. This research aimed to design a new approach to the buying and consumption process that would solve the packaging waste problem; therefore, the research logic was based on inductive reasoning. The data collected informed the development of a new theory. Qualitative research fit this research question because it sought to uncover trends, find deep insights, and discover new innovations. Quantitative data was also employed in order to make concrete decisions. The chosen methods, described in more detail in the following pages, included action research, design thinking, observation, interviews, polls, and a survey.

The Literature Review also aided the project in a number of ways throughout production. The re-use of materials presented the best possible outcome for a package's end-of-life; therefore, the project grew into a system of re-using durable materials. The types of materials and papers used and the amount of ink were also taken into consideration throughout the design and production process. Certain colors and effects of inks were avoided. Glass was chosen as a preferred material above bio-plastics, conventional plastics, and cardboards due to its durability and lower manufacturing emissions. The function of the package was also taken into account; containers were chosen based on their ease-of-use as well as hygiene. The Literature Review also contributed to the visual and brand communication, color choices, effective messaging, avoidance of greenwashing, and encouragement of green purchase intention.

3.3 The Project

To begin the project research, creating a *trends matrix* helped to identify the past, present, and future trends in the context of environmentally sustainable packaging. A *trends matrix* is a method of design thinking that utilizes a table of information. This method was chosen to help define direction and identify areas for innovation. In Table 1, below, the vertical axis represented tech, business, people, culture, and policy. The columns of the X axis grouped contextual trends into the categories of 'formerly,' 'current,' and 'emerging.' To increase specificity, these time periods were broken down into eras: Early 20th Century, Late 20th Century, Current, and Emerging. Periods before the 20th century were not included because they fell before the advent of the grocery supply chain system and the invention of mass packaging (Kumar, 2012, p. 39).

Table 1. Trends in Food Packaging Design

	Early 20th century	**Late 20th century**	**Currently**	**Emerging**
Tech	Mostly metal and glass, farm to family	Large factory production, industrialization of agriculture, Raw material extraction, plastics replacing glass	Bioplastics and 'compostable' materials (that usually cannot be processed unless in industrial contexts and cannot go into normal recycling streams)	Active and Intelligent Packaging, bio-based and home-compostable options that may not detract space from agricultural lands, internet purchase of groceries, bulk/no packaging
Business	Individual suppliers of staple foods, eg. Milkman, bakery, produce shop	Beginning of recycling as part of waste management system, big box stores take over small/local business in selling food staples	Toward greener energy sources in production, meeting desires of consumers for honesty in environmental messaging, trend towards Whole Foods	Perhaps new system in place for recycling these #9 materials such as compostable and bioplastics, Stores that sell in bulk only with reusable containers
People	Personal relationship with suppliers and local farmers garners trust	Lack of knowledge of environmental impact; Slowly learning how to recycle, cities picking it up	Want to trust brands commitments to the environment, skeptical, small apartments with less space for waste	Desire to create less waste / less harmful waste; want to know direct relation of how their purchase makes a difference
Culture	Small towns, family focus	Mass move to cities, fast food, convenience	Individuals, "reduce, reuse, recycle," Green movement, local buying, increased eco-awareness, farm-to-table, slow food	Zero waste lifestyle, Back to nature, diaspora from cities, desire for convenient healthy food and brand honesty and responsibility

Next, *framing the design challenge* according to IDEO's design thinking approach was chosen to clarify goals and focus on impact (IDEO, 2015 p. 33). This method honed the exact problem that the research was meant to solve. Starting with the problem of harmful food packaging waste, a design question was formed: How can we reduce ecologically harmful food packaging waste? The ultimate impact goal identified was to reduce the amount of harmful food packaging waste that ends up in the natural environment.

Thinking broadly, the following solutions were identified: marketing campaigns or better education about recycling, items designed with home-compostable materials, infrastructure making it easier to recycle, packaging that encourages recycling and re-use, increased purchases of sustainable packages over non-sustainable ones, public understanding of the consequences of waste, clean-up programs, and bulk buying with

re-usable containers (thereby eliminating packaging altogether). Next, the context and constraints were framed. It was found that the final solution should work across different regions and demographic groups. It also needs to be eco-friendly through the entire packaging cycle from raw material extraction to end-of-use.

Finally, when thinking of new ways of framing the question more specifically, the following questions came to mind: 'How could a new system of purchasing foods reduce packaging waste?' and 'How could a change in packaging design disrupt the cycle that leads to harmful packaging waste entering the natural environment?' (IDEO, 2015)

In writing an *intent statement*, structure was given to the research process, and support was provided in transitioning towards further researching the context of eco-friendly packaging design (Kumar, 2012, p. 49). The design problem was identified as 'how to reduce packaging waste's harmful effects on the environment.' The main option that was discovered was to create a brand of food packaging that was truly ecologically friendly and was perceived as such by consumers. This proposed solution included the creation of a system of bulk food dispensers and re-usable glass containers for dry goods. In this system, grocery stores provide durable jars for customers to re-fill at the store. Barcodes printed onto every jar track who bought what and how much. Maintaining your own set of jars allows for a customer loyalty discount system, instead of using the plastic cards that many grocery chains rely on. First time users are greeted with instructions and information on the benefits of bulk shopping.

Eco-conscious consumers who shop at grocery stores for staple products were selected as the target audience for design and marketing. The added value of this innovation would be the deliverance of an honest and trustworthy message that could help people feel good about their eco-friendly purchase decisions. The opportunity identified was to inspire a change in buying behavior and more care towards buying products from credibly eco-friendly brands while creating less waste in the environment.

Some possible risks to this proposal were also identified. People may not care enough to want to change their buying habits. Introducing a change in the system of buying staple foods may lead to backlash from stakeholders in grocery box stores, manufacturers of conventional packaging, and suppliers in industrial agriculture. Potential hygiene and food safety issues may be also brought into question (Kumar, 2012). In order to make this system feasible, each risk was considered and mitigated in the prototyping phase.

A *contextual research plan* and *user research plan* were used to organize and plan the different types of research methods (Kumar, 2012, p. 61). The areas for research were

defined as: eco-friendly design, eco-friendly consumption of food products, packaging design, bulk buying, and waste-free living. The most relevant questions to the context of study were related to how people bought and stored food and what motivated people to make eco-friendly decisions. The Literature Review provided knowledge about which factors encouraged people to think a product was “green” and which design practices made a truly eco-friendly package. What was assumed was how people typically bought groceries and stored them. The unknown areas for further research were identified: how open people may be to new forms of buying and storing food items, and how grocery stores, suppliers, and consumers would react to bulk buying and container re-use.

A *user research plan* further defined an audience and timeline for research. The types of people to study were identified as environmentally-friendly consumers, grocery owners, food and packaging suppliers, waste-free advocates, and those open to eco-friendly consumption or new buying habits. The participant attributes sought were a willingness to share personal habits and information, a fluency in English, an open mind, and a tendency toward creative thinking.

A design thinking methodology developed by IDEO, *Define Your Audience*, aided in the determination of which participants to study (IDEO, 2015, p. 44). This method was selected because it was best suited to reveal all stakeholders impacted in the context of the design. The following groups and people were identified as having a direct involvement: eco-conscious consumers, those who buy their food at grocery stores, people who mostly cook at home, food suppliers (farmers and agriculture, food processors, warehouses, distributors, and transporters), grocery stores (from box stores to local small businesses), and waste management personnel and groups (garbage and recycling collectors, recycling facilities, dumps, waste treatment plants). Next, those with peripheral relevance were established. These people and groups included local government branches responsible for recycling, waste management programs and pick up, federal government groups such as the FDA who determine food packaging and storage regulations, environmentally driven political parties, housing associations responsible for communal waste, and grocery store owners, CEOs, and investors. The fans of a bulk buying, zero waste system were assumed to consist of environmental groups (nonprofit, political, and governmental), eco-aware consumers, individuals who cook their own meals, those who want to save money on food purchases, people who don’t have space for waste, and brands or grocery stores that want to improve their eco-friendly image. Potential skeptics were speculated to include corporations who have a rigid packaging system in place and rely on it as marketing,

people who like individual servings, brand loyal customers, people who hate or fear large-scale change, and investors in packaging materials such as plastic. Consumers who cook at home, but are not eco-aware or are new to thinking green, food suppliers and farmers, grocery store owners, employees, and planners – all were determined to be key stakeholders whose opinions could make or break the concept's viability.

3.3.1 Field Observation

Field observation provided necessary insight into consumers' lives, problems, and needs. Two methodologies were chosen as a basis for taking notes: *Five Human Factors* and *POEMS*. The *Five Human Factors* provided focus in the following areas: physical, cognitive, social, cultural, and emotional. Using a camera, a pen and a notebook, four locations carrying bulk items were observed: Minipreço, Go Natural, Maria Granel, and Miosótis. Following the five factors format, notes were taken on people's physical interactions with things and other people, their cognitive associations of meanings, their social behaviors, cultural values, and emotional responses (Kumar, 2012, p. 177).

Using the *POEMS* methodology, further insight was gained into the food packaging context and the specific ways in which people interact with bulk food buying and container re-use. *POEMS* is similar to the *Five Human Factors*, but instead looks through the lens of people (P), objects (O), environments (E), messages (M), and services (S) (Kumar, 2012, p. 181). Specifically, notes were taken on the people in the stores and their motivations for being there, the kinds of objects present and their relation to one another, the settings and environmental factors present, the messages being communicated, and the services offered.

At Go Natural, an organic grocery chain, the bulk items were stored in one section along the back wall, but during a period of twenty minutes, nobody was seen using them. The bulk food dispensers contained cereals, dried fruits, seeds, nuts, beans, and grains – all items that were also available in packages throughout the store. The bulk section included a couple of signs with instructions on them. One of them made mention of a scale, but there was no scale in this location (see Figure 1, which roughly translates to: "1. Choose, 2. Put it in the bag, 3. Weigh"). A second sign contained the message (translated to English): "Why buy bulk products? 1. Saving packaging reduces urban solid waste, 2. Allows you to carry only the amount you need. 3. Most affordable prices" The last sign translated to: "In bulk, to your liking. Our selection of bulk and organic products has been designed to make your meals healthier and more flavorful." Below the dispensers, there

were different sizes of bags to choose from, but no scale was present. This presented a possible deterrent from buying in bulk, since nobody could check the amount that they were buying or what it would cost.

Figure 1. Instruction sign

Figure 2. Bulk goods section at Go Natural, brown bags at bottom left

The kinds of people in the building consisted mostly of cashiers and a few women alone, but a couple of families were also seen shopping for food. Customers were observed deciding which foods to buy, and checking quality, prices, and sales. They presented a range of emotions; a child appeared bored, while a woman purchasing organic cat food had a smile on her face. At checkout, most people used their own bags, suggesting a concern for the environment. The store was also connected to a café that served natural and organic food. The value of health was emphasized throughout the environment.

Figure 3. Open olives and plastic bags

Figure 4. Dried bean containers and scoops

Figure 5. Dried fruit in shipping box

A larger organic store, Miosótis, was also picked for a site visit. Their bulk sections were spread throughout the store by category: dried foods, olives, and soaps. The olives were in large open jars and plastic bags were the only offering of container. One woman was seen putting her hand in the bucket of fava beans and eating them, which could have led to hygiene issues. The dry foods section contained beans, nuts, cereals, grains, cookies, and dried fruits. Most dispensers operated with pull-down levers, but the dried fruits and cookies were in containers with tongs. Trays underneath served the purpose of catching spills. Labels on the dispensers told only the name of the product and its price per kilogram. Paper bags were offered for filling, but only in one size and one place that was so low to the ground that people needed to kneel to pick them up. Some people looked confused when trying to find them. Customers were observed holding the tops of the bags closed over the openings of the dispensers to prevent spillage. A scale allowed people to measure what they'd poured and how much it would cost. Extra stock sat in boxes underneath, beside, and across from the dispensers and seemed to be disorganized. Some of the dried fruits were presented in the same boxes that they had been shipped in, perhaps avoiding extra packaging waste. However, this led to the problem of flies. The store also sold dried goods in packages. In fact, throughout the store most items offered were wrapped in packaging.

Figure 6. Tray to Catch Spills at Miosótis

Figure 7. Nuts and Candies at Minipreço

Figure 8. Scale weighing nuts at Minipreço

Many families were shopping together on the Saturday afternoon of the visit. Children appeared excited to help out. They rushed to get bags for the bulk foods, and one girl asked her mother if she could fill them herself. Some kids asked their parents for specific foods, such as cookies. A mother and grandmother played games with their baby while shopping. Both families and couples seemed highly engaged in conversation about which foods to buy. A large environment, Miosótis encompassed the values of family, community, environmentalism, and health. The space also contained an auditorium for classes, shelves of books about organic cooking, bathrooms, and a café with affordable and vegan options.

To provide a contrast, the site of Minipreço was chosen for observations of everyday budget and non-organic shopping. Many people of different demographics were shopping here on a Monday afternoon. The store had a small bulk section of nuts and candies, although a few of the containers were empty. Packaged versions of the same types of food were for sale below. Thin plastic bags were provided for filling, and some were discarded underneath the dispensers because of rips. Customers used a scale to weigh their goods and calculate prices. The functionality and purpose of a blue tape dispenser was unclear, since the bags could be tied at the top. There was no guidance on

how to use the blue tape machine. A self-service sign gave the following instructions: “1. Choose a bag and place it under the machine, 2. Press down on the lever to desired quantity, 3. Close the bag with the device, 4. Pay at the checkout.”

Maria Granel is a zero-waste store in Lisbon with a wide variety of dried goods. This location provided a unique opportunity to gain deep insight into bulk buying. Here, an entirely different dynamic of customer interactions was observed. There were about five different consumers in the store at all times during the twenty-minute observation period on a Friday evening. People showed a high level of interest in their food and method of buying it. They touched the labels on the food dispensers and spent a lot of time thinking about each one. Some were observed opening the containers and smelling the contents. Most customers were couples who browsed together and had lengthy discussions on which foods to buy. Many questions were asked of the employee, and it seemed that a lot of care went into purchase decisions. All of the customers had a high level of interaction with each other and with the store employee. One limitation in observing was language-based, since all of the customer conversations were entirely in Portuguese.

Figure 9. In-depth information cards for herbs

Figure 10. Nut and dried fruit containers

The environmental values present at Maria Granel could be seen throughout the neighborhood of Alvalade in Lisbon. Near the store, two people were seen picking up trash on separate occasions. Families with small children took dogs and babies for outdoor walks near pharmacies that advertised homeopathic goods.

The store carried a large number of bulk dried goods: grains, grain mixes, spices, flours, dried fruits and vegetables, beans, sugars, salts, chocolates, cereals and granolas, honey, syrups, teas, powders, nuts, cookies, hair brushes, and home goods. However, all of the drinks in the cooler were in glass bottles. Nobody appeared to be using shopping lists to gather their food items; it was more a method of browsing and choosing. The food labels contained a lot of information about each product, including its origin and price; yet, not all labels listed the ingredients. There were also separate information cards describing their types of teas, herbs, and breads.

Dispensers at different levels lined the walls and containers at table height sat beneath them and on counters within the room. The wall dispensers opened with a hand lever and the table containers held tongs, spoons, or scoops. In order to refill the dispensers, the single employee was observed opening them at the top and pouring from large paper sacks. She had a stool to help her reach the top. The sacks were stored in drawers below the counters and also in a closet in the back. Next to the dispensers sat differently sized brown paper bags, although glass jars and cloth sacks were also available for purchase in the back. The employee offered larger canvas bags to carry multiple items while shopping in the store. Thin plastic gloves were provided, probably for sanitary reasons, since the tongs and scoops often fell directly into the dried foods. Only one person was observed using the gloves, perhaps because there were no garbage bins to dispose of them after use. In a store so dedicated to waste-free living, plastic gloves also seemed out of place.

Figure 11. Candy dispensers and plastic gloves

Figure 12. Cloth bags available for sale

Figure 13. Glass containers for sale

Figure 14. Syrup dispensers and bucket to catch spills

Figure 15. Storage bags to refill food dispensers

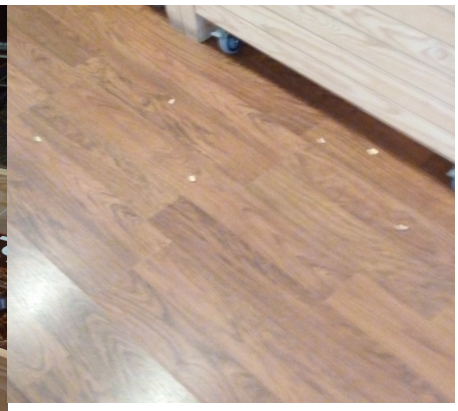


Figure 16. Peanuts spilled on floor

Customers faced a few physical and cognitive problems. The customers filled the opaque brown bags provided, but sometimes had to check inside of them to see how full they were. It wasn't clear to everyone what to put items in or where the bags were, so

some people asked me for assistance. Perhaps there was also some confusion about who was an employee, although she had on an apron with the company logo. One woman had trouble with a piece of dried vegetable not fitting in her bag. At one point, someone spilled peanuts all over the floor because he missed the bag when using the dispenser. One man squinted a lot to read the small text on the labels, and another man had to kneel on the floor to read the lower level labels. No scales were apparent to check amounts or prices of goods before buying them. At checkout, there was nothing on the bag to note what items were in it. The cashier had to rely on the honesty system as well as physically looking into the bag to see what was in it. In order to categorize it correctly, she must have been required to memorize every item in the store.

3.3.2 Preliminary Interviews

Interviewing the target audience provided key understandings in creating a human-centered design. Semi-structured informal interviews began with permissions documents and an explanation of the importance of the research. Broad warm-up questions about the person's life, routines, and values helped the participants open up and feel more comfortable. Questions were tailored to each specific person and their role in the current system of food procurement and consumption.

Four interviews took place before the creation of prototypes to gauge interest and viability and to inform direction. The people interviewed included an employee at a produce packaging facility, an eco-conscious consumer, a vegan video blogger, and a Whole Foods employee. One possible limitation was that these preliminary interviews included only a homogenous demographic of females between the ages of twenty and thirty. However, it was noted that the vast majority of waste-free living blogs were run by females between twenty and forty, suggesting a possible target audience for the proposed bulk buying system. The first interview was conducted in person with two English-fluent Portuguese participants in Lisbon, Portugal. The following two interviews took place over the phone with participants located in the northeast United States.

I conveyed that the final results would be beneficial to the respondent by explaining the consequences of packaging waste and the importance of honestly representing the eco-friendliness of a product. The interviews began with a couple of sentences telling the respondent about the goals of this thesis and project. In formulating questions, I kept in mind that the utility must be evident to the respondent. High literacy in English was a requirement in sorting potential respondents, since there was a potential language barrier

for an English interview conducted in a Portuguese speaking city. The questions were conversational, but simple and concise with clear instructions for how to respond to each part. In creating the questions, the following guidelines were adhered to: no questions included jargon or sensitive issues and none were irrelevant to the study. The questions varied depending on each participant's interests and expertise. See Appendix for a list of questions asked and for the full transcripts. All interview audio was recorded using the QuickTime application on a MacBook Air laptop. An online service, Transcribe, aided in transcribing the findings from audio to text. The goal of the first round of interviews was to identify the values, interests, habits, and potential problems of the stakeholders.

The first interview took place in person with two Portuguese participants. One identifies as an environmentally conscious consumer and the other makes online vegan cooking videos. They both said that they prepare meals at home to save money. The vegan cook stores some of her food in glass jars, but leaves beverages and cans in their packages. She buys loose spices in bulk from large supermarkets. Refilling herbs and spices this way is preferable for her because she already has labeled jars that she loves. Stores like 'hypermercados' have started to stock cereals, pet food, and other dry goods in bulk for less money than the same items in packages. The eco-conscious shopper re-uses glass coffee jars for spices and pasta, but recycles the plastic that contains other items. "Paper or soft plastic I try to recycle because they don't last long," she said. They both confirmed that they were more likely to re-use packages if they were made of hard plastic or glass. They like to re-use containers to save both the environment and the money that would otherwise be spent on new packaging. The eco-aware shopper holds onto glass bottles for making lamps, but has never actually made one. Her mom re-uses packages as well; she paints and sells jars at flea markets, sometimes with candies inside. However, she explained that children are the most likely demographic to make art projects with re-used materials.

The brands that the two young women buy depend on which are the cheapest at the supermarket, as long as they are not "terrible." The eco-conscious consumer said that she's not picky about most things except milk, and she buys whatever is inexpensive or on sale. The vegan chef mentioned that she likes the brand Rude Health. They use raw paper and cardboard boxes and are a bit expensive, but the packages are large and contain a lot of food.

The vegan chef's ideal supermarket would be committed to reducing plastic and packaging. However, they both expressed concerns over whether a waste-free system

would work on a large scale for everyone. They noted that it was more expensive to buy in bulk at a specialty shop such as Maria Granel than at a big box store. They deduced that it may be more expensive because zero-waste is a current trend. The vegan chef said that her ideal package could dissolve in water, citing an example of the cosmetic company Lush's packaging peanuts that are edible, made of corn, and can dissolve in a bathtub of water.

A twenty-minute interview with an employee at a produce packaging facility took place over the phone from Lisbon to the northeast United States. At the packing plant, she places onions and potatoes from farms into vexar (thick plastic netting) or thin plastic bags. The facility's customers, usually grocery stores, pick produce packaging based on its visual appearance so that it is ready to display in stores with minimal effort. Her company doesn't sell to restaurants because restaurant produce goes directly into cooking and doesn't need to be branded. Before transport to stores, onions are placed into bigger net bags as secondary packaging, while potatoes go into larger paper 'master' bags. Some customers require the packaged produce to arrive in boxes, so the packaging facility re-uses the boxes that the farms deliver the produce in. Sometimes the vexar or thin plastic bags are faulty and they have to be returned to the manufacturer. When a type of packaging is overstocked, when a customer stops buying from the facility, or when there's a sudden change in labels, they end up with extra packaging that has to be taken away by a recycling company. The plastic netting, however, must enter the regular trash stream since it cannot be recycled. She also noted that they face inventory problems with packaging and that the floor often becomes filled with empty boxes taking up space.

She trusts the brand Whole Foods and likes shopping there because their transparency about ingredients helps her avoid the foods she is allergic to. She also appreciates their atmosphere: the grocery chain is outfitted with nice lighting, flooring, and cleanliness throughout. In addition, they have a rigorous food safety program, which is important to her. Her ideal store of the future wouldn't have health food in a separate section and it would focus on sourcing locally. "People like seeing where things come from. I think people would like more local stuff," she said. For her, the ideal package would use the least amount of waste possible, "because it's better for the supplier, the environment, and everyone except for the companies selling packaging materials."

She's been highly trained in food safety and she anticipates health problems originating from improperly handled bulk foods. Grocery stores accept no responsibility for foodborne illnesses derived from people touching their bulk items, so this liability falls

on either the suppliers, packagers, or the farms. Small things such as earrings can also fall into open bulk containers. Even when people can't touch what's inside, they could potentially touch the bottom spout of a dispenser, she warned. Customers also handle produce a lot. Whole Foods claims that they encourage customers to wash their hands, but they provide no directions to bathroom sinks and only a hand-sanitizing unit at the front doors. She voiced a suggestion that employees and customers should be trained in food safety, and perhaps even be required to take an online course in order to have membership to a buy at a bulk grocery store. "All it takes is one really bad [foodborne illness] and then your name is ruined," she concluded, citing the example of Chipotle's E. coli outbreak; she still associates their name with sickness.

Next, a phone interview was conducted with an employee at Whole Foods. In her observation, their customers often buy in bulk. "People are sort of convinced that the bulk is going to be fresher," she explained. It's re-filled or topped off every day. Customers also like buying as little as they want and there's more variety in the bulk section. People return pre-packaged foods more than those bought in bulk. She said that at the location where she works, the bulk foods may be more popular than the same items in packages.

Despite its popularity, the Whole Foods bulk section comes with its own set of problems. Customers often don't understand how to use the system. For public health reasons governed by town law, they are not allowed to bring their own containers; Whole Foods cannot guarantee their cleanliness. When using the scooped items, the spoon could scrape against the sides of their personal containers, and if unclean, could cause an outbreak in foodborne illness or cross contamination of allergens. Instead, Whole Foods offers sturdy plastic bags to fill with bulk items. A common problem with produce bags is that they catch on the top edges of the brown paper shopping bags or on the conveyor belt and usually rip, causing spills. Alternatively, they also offer six-pound brown paper bags and half pint, pint, and quart sized clear round plastic containers for filling. Bulk items are re-stocked from large layered brown paper bags. After use, some of these bags are recycled and some are composted. Whole Foods has a compactor for all their paper and cardboard and a composting bin that is periodically taken to an industrial-scale composting facility.

At checkout, the cashiers use a codebook to weigh items. Employees punch in the food's code and the system knows the price and weighs it. Then they need to manually adjust the price by looking up each container's weight, and subtracting it from the total weight. Customers don't always remember which foods they dispensed, although they are

supposed to write down each item's name or code on the bag or its twist tie. They are also sometimes dishonest about which foods they selected. She cited an example of their self-serve peanut butter machines – the cheapest is regular salted peanut butter at $2.99 per pound and the most expensive is almond butter, at $7.99 per pound. Sometimes customers buy almond butter, but claim it as peanut butter. "We are expected to just take their word for it, but people definitely are dishonest a lot," she said.

She buys her own groceries from Whole Foods for convenience, quality, and their 20% employee discount. She purchases mostly produce, meat, and dairy, and chooses brands based on their quality, taste, and marketing. Packaging draws her in, especially if it is visually pleasing or conveys a sense of legitimacy. She buys many foods in large quantities, entire cases that she stores in huge milk crates and stacks on shelves in the basement. An employee at her store handles special orders like these large cases – some people shop by ordering repeat quantities of items per month or when the shipments come in. She tries to recycle the secondary and primary packaging that her foods come in. There is a cash back redemption program for returning beer and soda cans in Massachusetts, where she lives.

The Whole Foods employee re-uses glass jars for storing dry goods and wheat germ that her mother uses to make bread. On one occasion, she and her mother couldn't find their usual brand that is packaged in glass, so they bought wheat germ in a cardboard box. They go through this ingredient slowly and store it in the fridge, so in order to preserve it, they removed it from the cardboard and put it into the pre-used glass jars. She also uses mason jars for other dry foods. However, she hates their style of "two-step" lids that are primarily used for canning. In canning, the lids are separated since the ring can be re-used, but the flat top cannot. Green Mountain Gringo salsa comes in mason jars with simpler lids, so she saves these single piece metal lids because she prefers them. She still has these jars and uses them for bulk goods that come in plastic bags. As she put it, "I'm not trying to deal with that stupid bag." Bulk goods in plastic bags often rip, and loose ingredients can go everywhere.

For her, the grocery store of the future would allow people to bring their own containers, but with a system that has an automatic sanitation machine that each container must go through when the customer enters the store. She also suggested that this machine could put a dated sticker on the container with its weight. Dating it would prove to the employees that it had been weighed and sanitized at that location and on that date. She mentioned that use of services like Instacart and Amazon Fresh is trending upward – more

people are buying groceries online. However, she noted that many more of the purchases made this way are returned than in conventional buying. She also noticed a social aspect to grocery shopping. “On the one hand, people […] hate going to the grocery store. On the other hand, a lot of people love it because it’s their opportunity to socialize with their neighbors. They [also] like being able to select their products themselves,” she observed. Customers want the control to be able to select the most ideal “best-buy” date available and the freshest looking produce. Overall, she doesn’t believe that brick-and-mortar grocery stores will die out.

Key findings from these four preliminary interviews were related to the main subjects of price, food safety, branding, and re-usable materials. All participants reported using glass jars for storing dry goods at home. Less durable substances such as thin plastic or paper cause bags to spill at stores and in the home, so the materials chosen to hold bulk foods should not easily rip. Brands convey a message through packaging that appeals to some customers; “I like the *idea* of things,” said one respondent. For others, saving money was the most crucial to their purchase decisions. They all said that they hope future supermarkets and food packagers will waste less. Two of them brought up safety concerns that must be taken into account in the design process. Specifically, no consumer should be allowed to touch loose foods, containers should be sanitary, and perhaps some mandatory food safety education should take place as part of the bulk buying system. Although customers increasingly shop online for food, grocery stores aren’t likely to disappear. People enjoy buying in bulk, but often misunderstand how to, or lie about their purchases.

3.3.3 Ideation

The grocery store site observations and the participant interviews resulted in a number of areas for improvement in bulk buying. A list was formulated of the main problems and potential solutions. Text on many dispenser labels was too small for easy legibility, and didn’t contain enough information. In making prototypes, the labels and text should be large, clear, and list all ingredients and their sources. Some of the food dispensers were too low for people to use, which could easily be remedied by placing them all at arm’s reach. Opaque bags didn’t allow customers to check how much they were buying. Semi-transparent or clear branded and refillable containers, such as glass jars, could be offered in multiple sizes. The problem of food spillage could be solved in a number of ways. Either a tray below could catch stray pieces, or a sensor could detect the

placement of a correctly sized container below each dispenser, opening the dispenser only when ready. The need for plastic gloves could be eliminated by storing all items in dispensers rather than trays with scoops. Customers faced some confusion about the buying process, so clear instructions should be placed throughout the bulk system. Some found it difficult to locate bags, so the containers ought to stand out as the first thing in the front of the store. Cashiers relied only on honesty and memorization as a way to identify dried foods at checkout. Employing a barcode system for each container could remove this problem. Since some stores lack a scale, there was no way for most customers to check the price of what they were purchasing. A scale could be built into the counter below each dispenser, displaying the kilograms and price of each filled container.

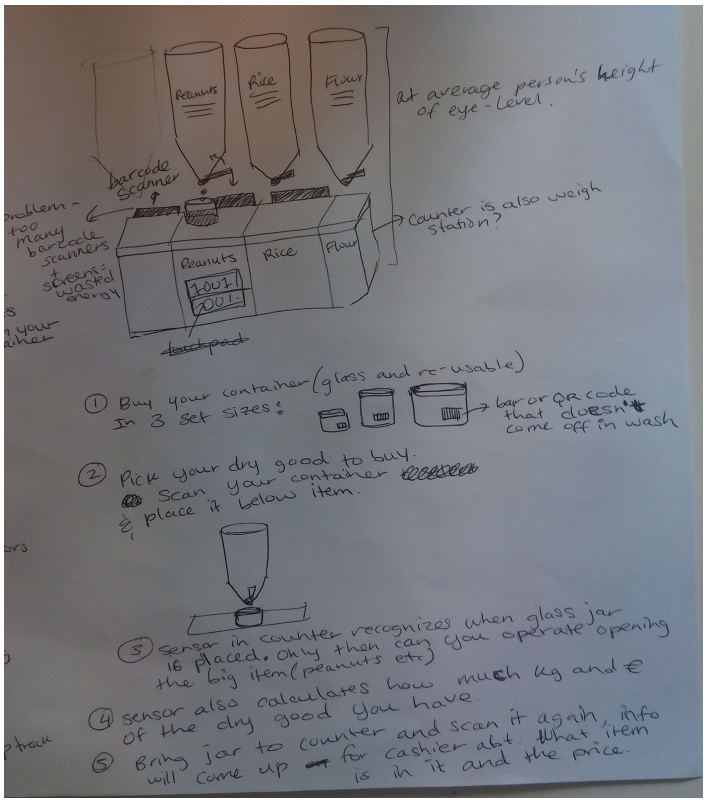


Figure 17. First sketch of bulk buying system

Taking into account the issues brought up in the site observations and interviews, a new system was sketched out. In this first sketch, Figure 17, a row of dry food dispensers lines a wall with labels at an average person's eye level. Directly beneath them are barcode scanners and a countertop that also serves as a weigh station. On the forward-facing side of the counter, LED displays show the exact kilos and price of the item. Customers can buy store-branded reusable glass containers with printed barcodes that don't wash off.

Once they choose a dry food to buy, they place the container below the dispenser and the system records the product and customer information using the barcode scanner. A sensor in the counter recognizes when a glass jar is correctly placed and only then does it allow the customer to release product from the dispenser. The counter scale calculates how many kilograms the item weighs and how much it will cost, and displays it on the LED screens. The customer brings the filled jar to the counter and an employee scans its bar code. Information will come up about which item is in the container and the overall cost. One problem noted with this sketch was that there were a large number of barcode scanners and screens, which could lead to energy waste.

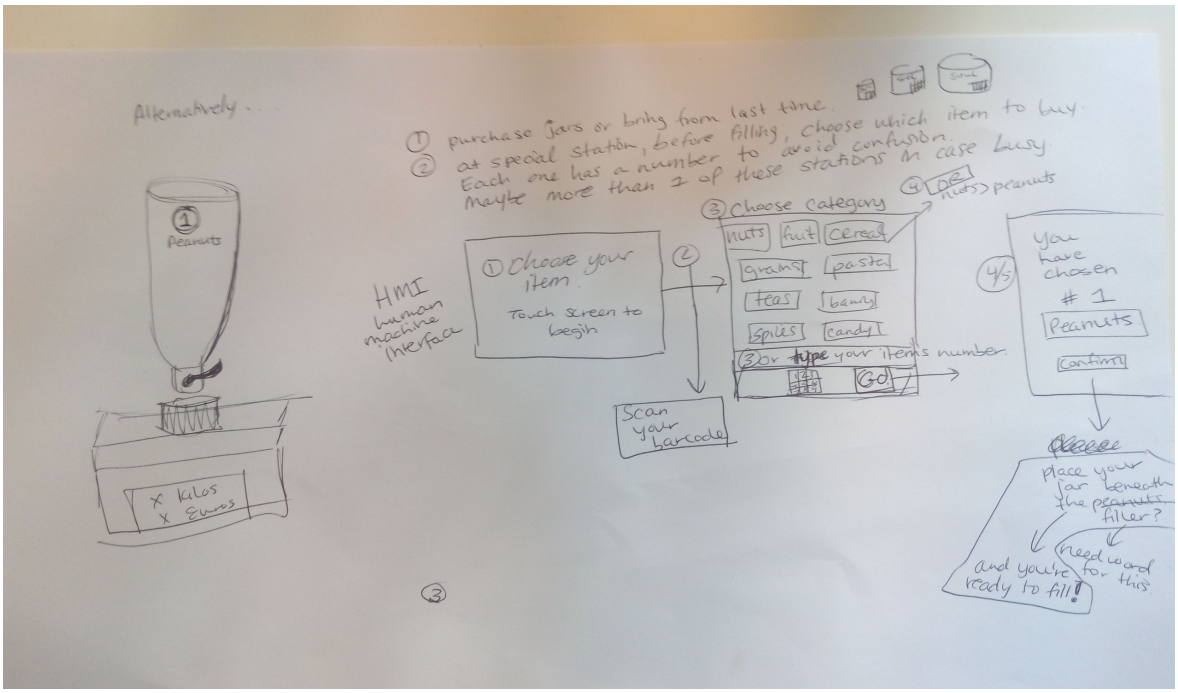


Figure 18. Second alternative sketch of bulk buying system

The second sketch, Figure 18, was similar except that a touch screen station replaced the barcode scanners. Each dispenser was given an identification number. At one or two touch screen stations throughout the store, customers can scan their container's bar code and use a human machine interface to choose the item that they want to buy. This allows the correct dispensers to open. Some problems with this system were identified. Multiple customers might want to buy the same product, and the counter would not recognize when the correct person's container is placed below the dispenser. Additionally, barcode scanners only take up energy when they are in the process of scanning. Touch screens use a lot more unnecessary power.

The third sketch returned to the main points of the first, with a few improvements. The weight and price displays only turn on when an item is placed on the counter scale, thereby saving energy. Displays similar to those found in digital clocks would be used, employing low-watt LED bulbs that only take up 8-12 Ma/milliamps of power. Barcode scanners under each dispenser use only a few milliamps and can be set to auto-start when motion is detected, so that they are not always using energy. In this sketch, a small LED light on the dispenser alerts customers to whether or not the dispenser is ready to be used. Round tiers of sensor pads at different heights help people correctly place their containers. All containers have wide mouths to prevent spills. Once a jar sits in the right place, the pad sensor below it turns the bar code scanner in the back on. The bar code scanner accepts the container's bar code, turns on the counter weight screens, and the LED light on the dispenser turns from red to green. The customer can now use a lever or button to dispense food.

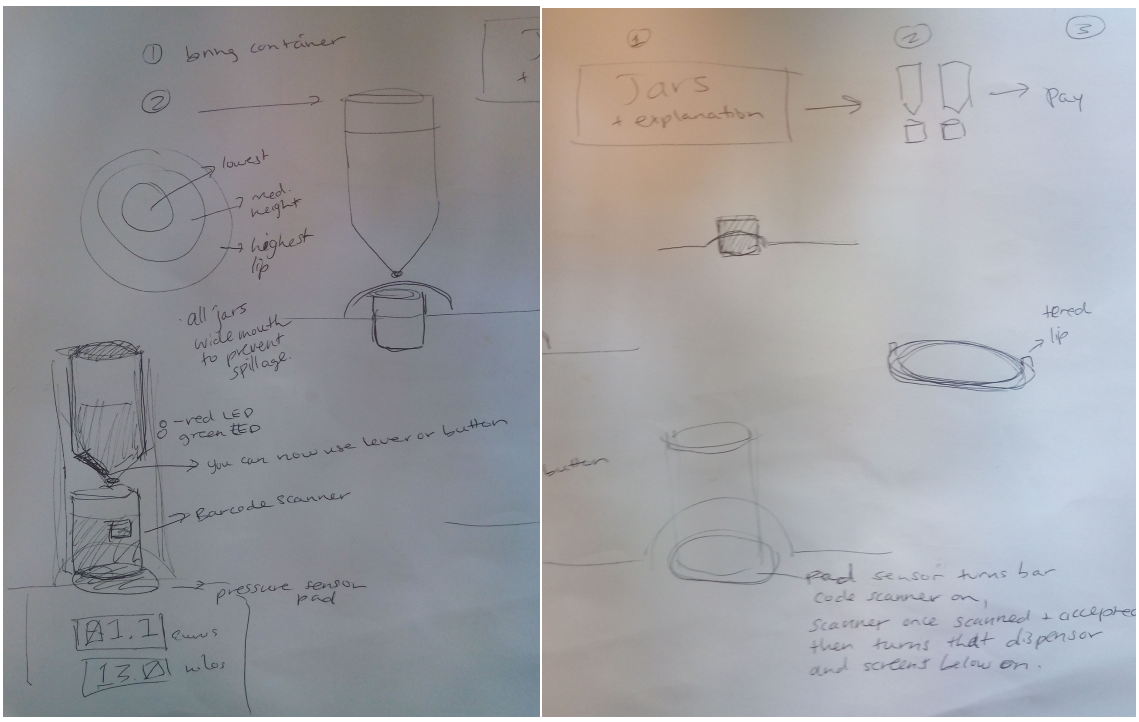


Figure 19. Third sketch of bulk buying system

This third sketch led to the creation of the first 3D prototype. Following the third sketch as a guideline, the 3D model contains jars with barcodes and dispensers with barcode readers, LED lights, and weight sensors. The jars were designed to fit perfectly into the rings in the base. One limitation was the software's material texturing. The dispensers and jars were meant to appear as glass and metal on top of a wooden counter.

The appearances of these surfaces on screen do not completely match those of the intended materials. The model was created in Autodesk Maya 2017 on a MacBook Air 2015 running operating system OS X El Capitan. A short demonstration video was made using QuickTime to explain the parts of the system and the functionality of the dispensers.

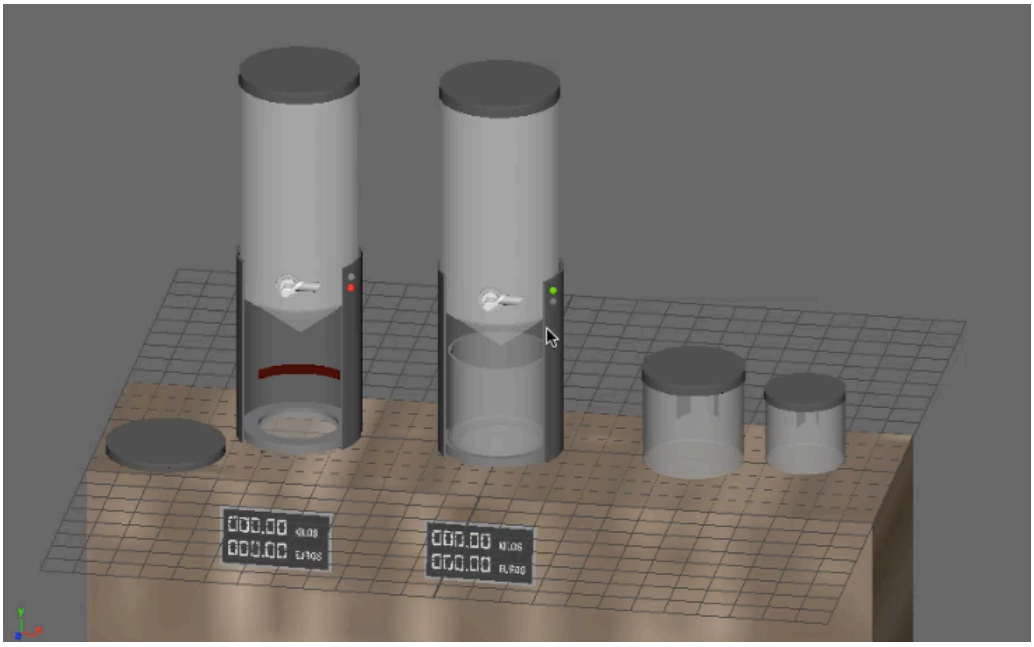


Figure 20. 3D model of dispenser system

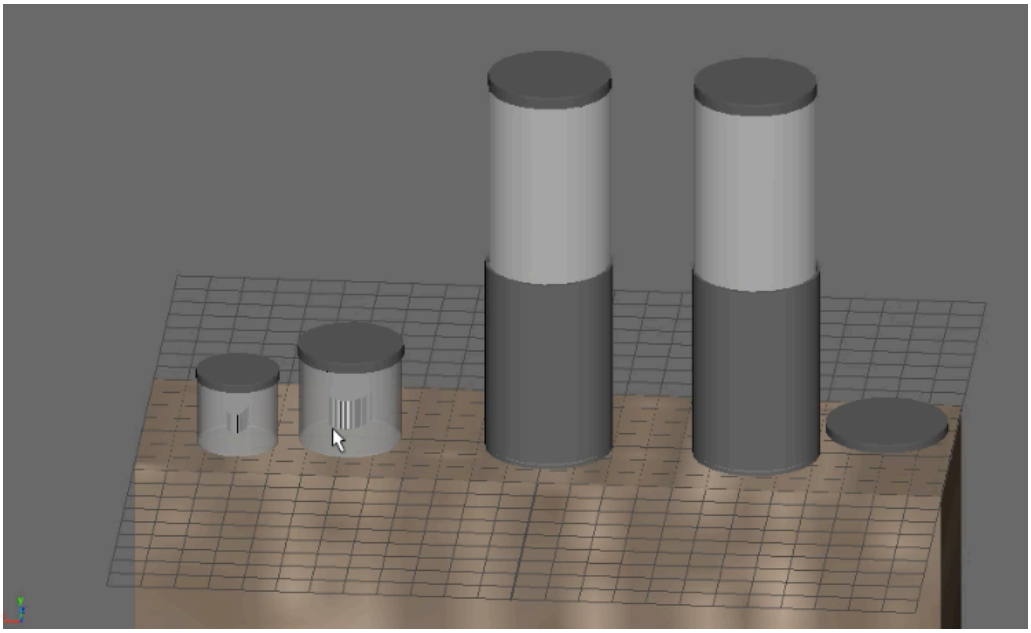


Figure 21. Back of 3D model with barcodes

Figure 22. 3D model with scale and price screens

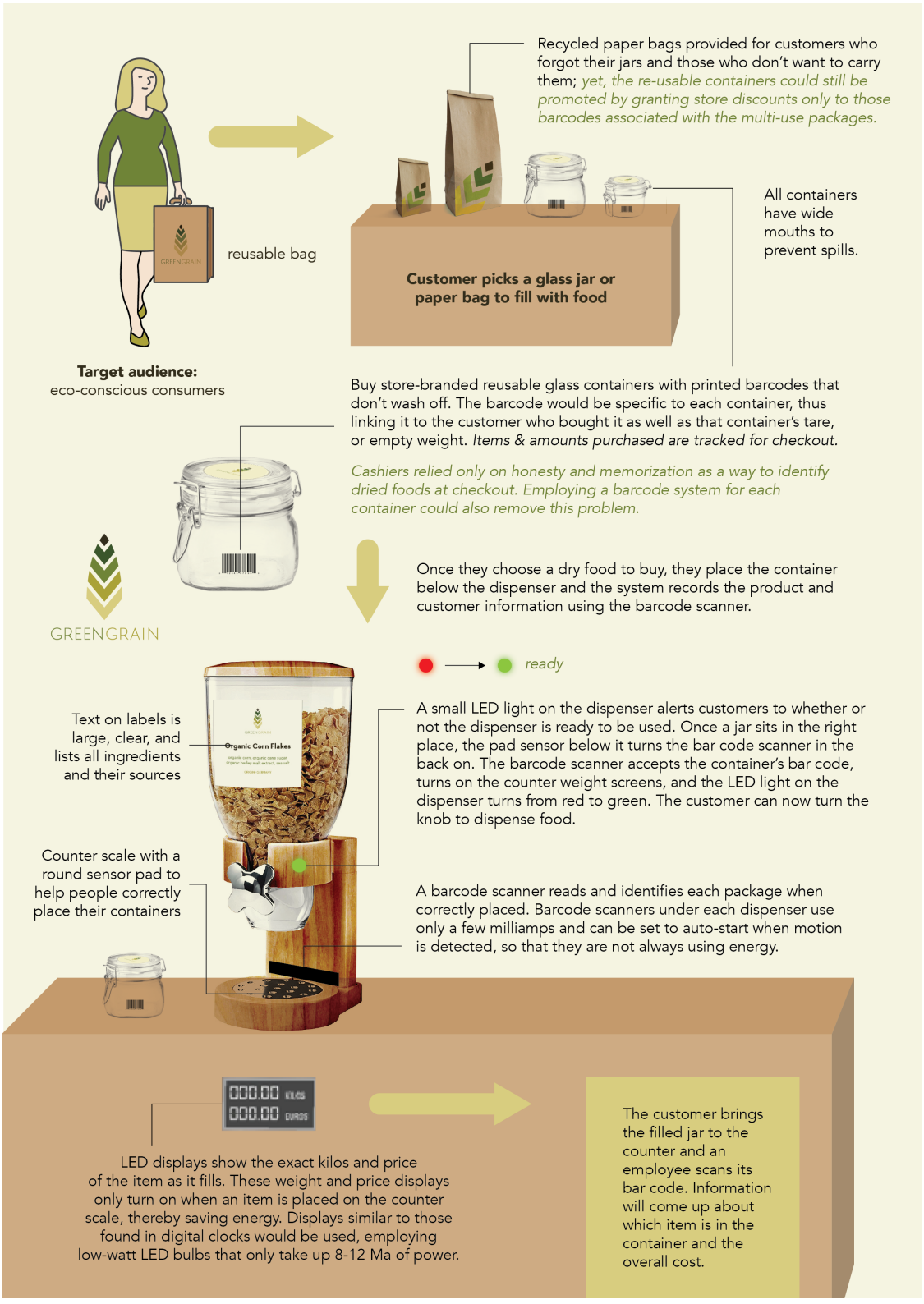


Diagram 2. Instructions on how to use Green Grain system

3.3.4 Action Research Interviews

In order to further develop and refine the concept, four more interviews were conducted after the creation of the first 3D model. Each participant was presented with the short QuickTime demo video and an explanation of each part of the system. The interview questions focused on if and how people would use the proposed solution, what suggestions they would make to improve it, and if they had already bought in bulk, what advantages and disadvantages they faced in doing so.

By using the *Extremes and Mainstreams* methodology developed by IDEO, the mix of interview participants was broadened. By looking at the outliers, new insights were gained. Participants were pulled from extreme demographics: people who live with many others, and people who live alone, children and seniors. A broad range of genders and ethnicities were included. Interviews began by explaining to participants that their voices and opinions were important to the research.

The first interview about the 3D prototype was conducted in person in Lisbon with a male participant from England. He did not fall into the exact intended audience of eco-conscious consumers, but instead provided a look into 'normal' grocery shopping habits. He typically shops at Minipreço, Lidl, and Pingo Doce and buys items that are pre-packaged rather than in bulk. After showing him the proposed system, he voiced concern over how the back-end data flow would work, specifically how the weight of a product and the dimensions of the package would be recorded. It was further explained that the barcode would be specific to each container, thus linking it to the customer who bought it as well as that container's tare, or empty weight. He wouldn't be likely to use this system, because he doesn't find it simple enough and favors options without so much technology. Instead of using self-checkout at grocery stores, he prefers to check out with a person. "I wouldn't feel comfortable using it," he said. He also thought that it looked too industrial in terms of materials, color, and light, and he would like to see more tactility. This could have been in part due to the screen rendering lacking the exact intended materials. After asking him to picture it in glass, metal and wood, he said he would be more likely to find it appealing. However, he thought that glass might be too fragile a material to carry to and from a store as a re-usable container. He also said that other types of material could be lighter and easier to carry. An alternative that he suggested was recycled plastic. Recycled paper bags could also be provided for customers who forgot their jars and those who don't want to carry them; yet, the re-usable containers could still be promoted by granting store discounts only to those barcodes associated with the multi-use packages.

The next interview took place in person with a male Portuguese participant who lives with many roommates. He shops mostly at Pingo Doce and does not currently buy in bulk. The purpose of the barcodes was unclear to him until explained in detail. He liked the overall design, especially the perfect fit of the containers and immediate display of kilos and price. He suggested that the dispensers in the proposed system could automatically dispense food and also close the containers. He liked the idea of having a foldable paper alternative to the glass containers. He described a different bulk buying system that he's seen in the past at grocery stores like Pingo Doce, one in which items are weighed on a scale that prints out a barcode sticker to put on each container. This method keeps track of customer's purchases, so that they can be easily scanned and paid for at checkout. However, he no longer sees this system in grocery stores.

The final interview about the prototype involved two members of the IADE community, a student in the design and visual culture master's program and a design Professor. They both most often buy groceries at supermarkets such as Continente. However, the Professor also enjoys fresh and dried produce from her family's land in the countryside. The student described the proposed system as convenient and mentioned some similar package-free stores that she had seen online. She asked why customers could not use their own containers and it was explained that the store containers would have the advantage of a customer loyalty program as well as easy tracking of purchases for checkout. The Professor said that she would re-use the container for this proposal and for other purposes 'if it were nice.' They both agreed that they would use this system if they had specifically planned to go shopping this way, and if the containers were not too heavy.

The Professor expressed concern over the physical production costs and materials of the dispenser. The price ranges of dispenser bases and material limitations were described. Specifically, all dispensers found online were made of plastic with either a plastic or metal base. The metal bases cost considerably more money by hundreds of euros. Plastic bases appeared cheaper and tackier, but could be painted to resemble metal or covered in canvas or fabric to provide a more natural and tactile look. Alternatively, the parts of the base could be replicated in wood. All of the food containers available for purchase were made of plastic instead of glass, perhaps to prevent breakage.

The dispenser purchased for modification was made of clear and white acrylic. It was bought on Amazon Spain along with a small kitchen scale with a digital readout. The dispenser was made by Fresh and Easy and was 42cm tall by 33cm wide. The scale, sold

by the brand Five Star and made by Smart Weigh, featured a stainless-steel platform and an LCD screen with six modes of weighing, including a tare function for calculating a food's net weight without packaging. It did not incorporate a price read-out.

The proposed system faced a number of limitations that prevented it from actualization. Ideally, the appearance of both the dispenser and scale would be improved to eliminate plastic. To fully illustrate the proposed visuals, a model was created in Adobe Photoshop, see Figure 61. During validation, this model was presented alongside the physical dispenser. Barring limitations, the scale and dispenser would fully function as intended. There would be a barcode scanner that would read and identify each package when correctly placed. The dispenser would only open after a successful scan and the price would display next to the weight. Items and amounts purchased would be tracked for checkout. Yet without a team of mechanical and software engineers, this final phase was, regrettably, infeasible. For the validation phase, the system consisted only of the dry food dispenser with a built-in scale and no back-end system tracking prices and barcodes. Rather than focusing on product design and engineering, the validation phase instead emphasized the visual identity of the brand and set of branded materials.

3.3.5 Brand Development

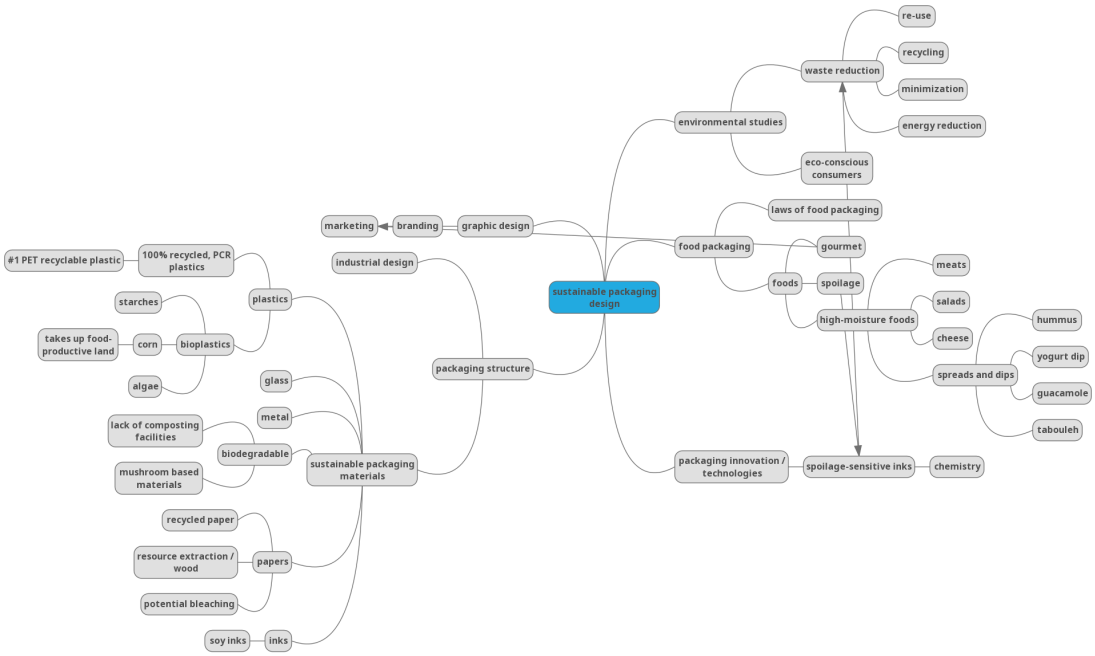


Figure 23. Mind map

Brand identity involves a whole system of different elements and touchpoints that convey meaning and recognition (Wheeler, 2009). The main purpose of the brand is to reduce harmful food packaging waste by providing reusable containers in a waste-free bulk buying system. A concept map (Figure 23) aided in identifying issues and areas of study related to the brand. The proposed package-free system embodies a set of core values that helped build the brand and visual identity. These values were defined as ecological sustainability, responsibility, authenticity, health, quality, transparency, trustworthiness, and ethicality. From these values, the following words were devised in order to come up with possible brand names: eco, bio, enviro, earth, sustain, innocent, pure, moral, good, right, responsible, soul, green, waste-free, zero-waste, package-free, trash-free, waste-less, clean, pure, guiltless, sinless, ecological, environmental, honest, virtuous, well, and whole. This list led to the generation of a few potential brand names and tag lines. *Soul: foods with a conscience* speaks to both the moral nature of waste-free shopping and the familiar phrase ‘soul foods,’ used in the United States to describe comfort meals and home cooking. *Green Eats* plays off of the phrase ‘good eats,’ slang for food that tastes good, but research showed that this name was already in use by a disposable tableware company. Four alliterative name options were also considered, *Sinless Sustenance, Green Grains Market, The Trashless Table* and *Pure Provisions*. Of

these, Pure Provisions already exists as a snack company. The remaining unclaimed names were tested using a Google forms poll posed on LinkedIn and on Facebook that reached a network audience of over 1,500 people. It included a brief description of the brand and its purpose as well as four choices for a preferred name. The poll was online for 24 hours and received 50 responses. The majority of respondents, 42%, chose the name 'Green Grains Market,' followed by 'Sinless Sustenance' at 24%, 'The Trashless Table' with 22%, and finally, 'Soul: foods with a conscience' with 12% of the votes. See Figure 24 for the poll form and Figure 25 for a pie graph of the voting results.

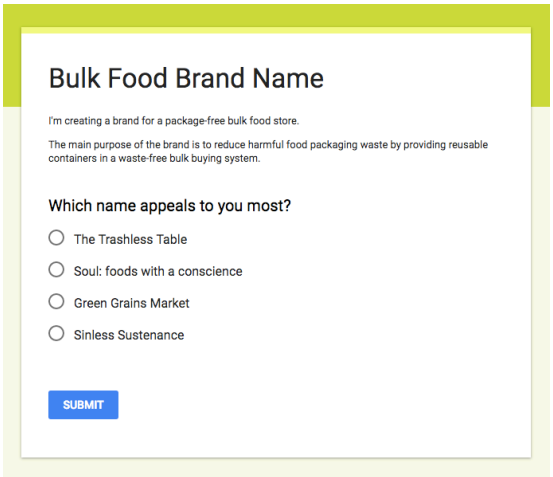


Figure 24. Brand name poll

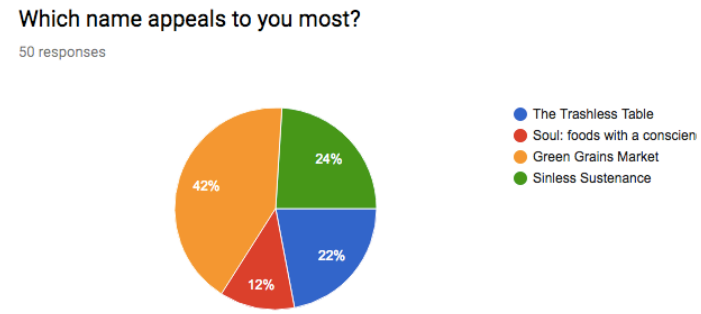


Figure 25. Brand name poll results

A successful brand identity must clearly convey the company's mission and exclusive value proposition (Wheeler, 2009, p. 11). In order to position Green Grains in the market, a competitor analysis was conducted. The leading competitors were identified as Day by Day, Granel, Negozio Leggero, Package Free Shop, and The Source Bulk Foods. Other notable, but smaller, brands were Fullbar, Loco, Novo, Original Unverpackt, and ceci&cela.

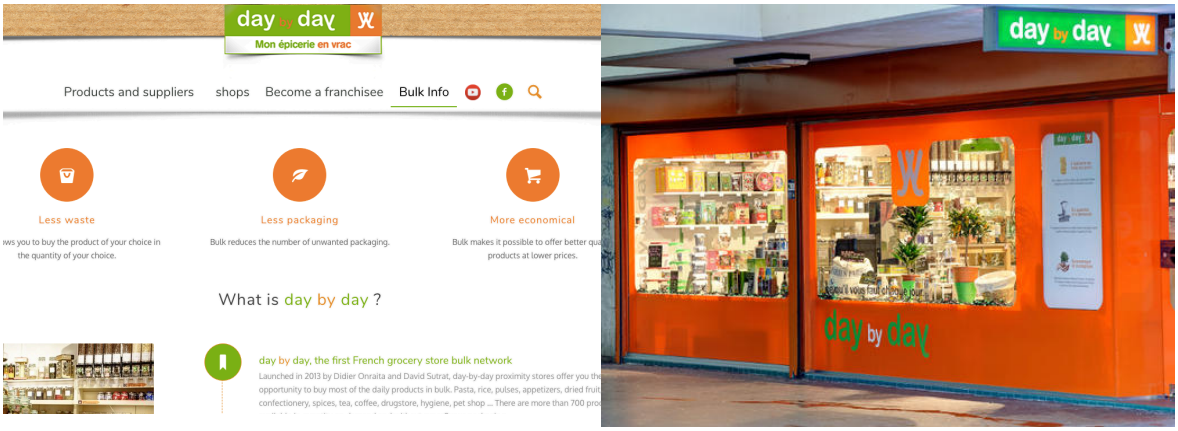


Figure 26. Day by Day website and storefront

Day by Day has many locations throughout France. Their tagline translates simply to “my bulk grocery” and their mission focuses on their large range of bulk products. They aim to carry products that fulfill all the customer’s daily needs, while saving them money and reducing waste. Their logo and branding makes use of two colors: bright orange and green. The Day by Day logo is set in a simple rectangle with rounded sans-serif typography, perhaps to suggest a more soft or human feeling. Their overall branding conveys a sense of simplicity through use of white space and a family of icons. The website also features skeuomorphic elements such as the cardboard photo header. The store labels, interior design, and signage match the brand’s look and feel.

Figure 27. Granel website

Granel is a Spanish brand with a focus on ecological sustainability and health. Their look and feel involves a lot of hand-drawn illustrations. Nearly all of their typography, including their logo, contains hand-drawn, sketch-like lettering. Their main color palette consists of green, but the exact shade seems inconsistent on their website. Their brand identity has a whimsical, almost child-like appearance.

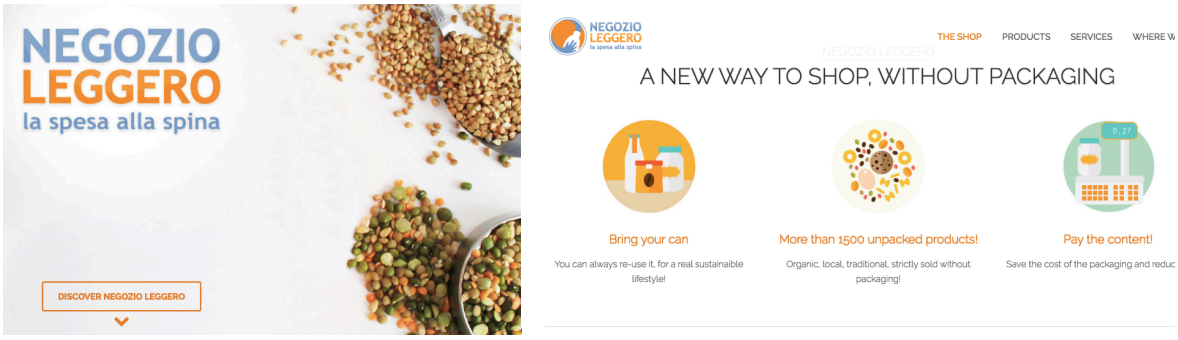


Figure 28. Negozio Leggero branding

Negozio Leggero, the largest Italian bulk food store chain, uses a color system of dusty blue and orange. Similar to Day by Day, their look and feel portrays a sense of simplicity, cleanliness, and professionalism through the use of white space and sans serif typefaces. Their logo includes a pictorial mark of a hand filling a bottle, meant to represent bulk foods, but the imagery lacks clarity. One advantage of Negozio Leggero is their large selection of over 1,500 unpackaged products, which is stressed on their website.

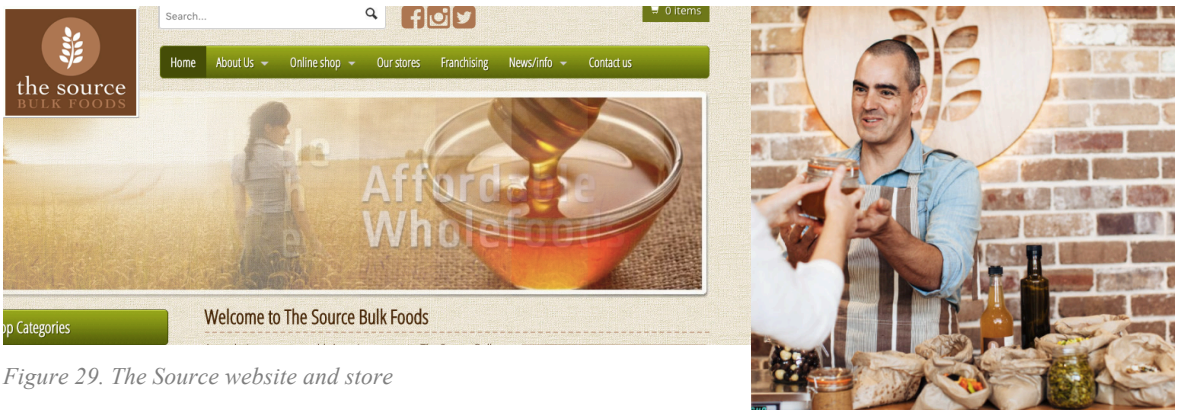


Figure 29. The Source website and store

The Source Bulk Foods has many locations throughout Australia. Unlike most of their competitors, their website uses lots of skeuomorphism, from the 3D style navigation and buttons, to the canvas texture background. Their logo however, uses flat design and a sans serif typeface in both lowercase and all caps. The color scheme of their visual identity presents more consistency in shades of brown and green. The main logo mark can also be seen in their stores' signage, which is wooden and lit from behind. Their product labels also contain the company logo and hand-written ingredients. Overall, their vision centers around environmental sustainability, traditional personal relationships in grocery shopping, and a large variety of available products.

Figure 30. Lauren Singer and bulk goods

Package Free Shop in Brooklyn, New York was founded by Lauren Singer, a prominent blogger and influencer in the waste-free movement. She makes use of her public identity as a personal brand, and her blog, Trash is for Tossers, has gained her fame and speaking appearances at major universities, television shows, and conferences around the world. She and her business partner run a minimal and very organized shop featuring matching product labels, branded bags, custom neon signage, and consistent typography. The Package Free Shop logo and website use a clean, condensed sans-serif typeface in all capitals with increased tracking. The use of all caps in the website navigation may lead to slower reading times, but the look and feel remains very professional, minimal, and open due to use of negative space. Package Free Shop's logo uses a simple line icon of an open box in black on white. Their product labels are large and easily legible and list all ingredients as well as practical usage suggestions. However, they lack any information about product origin and organics.

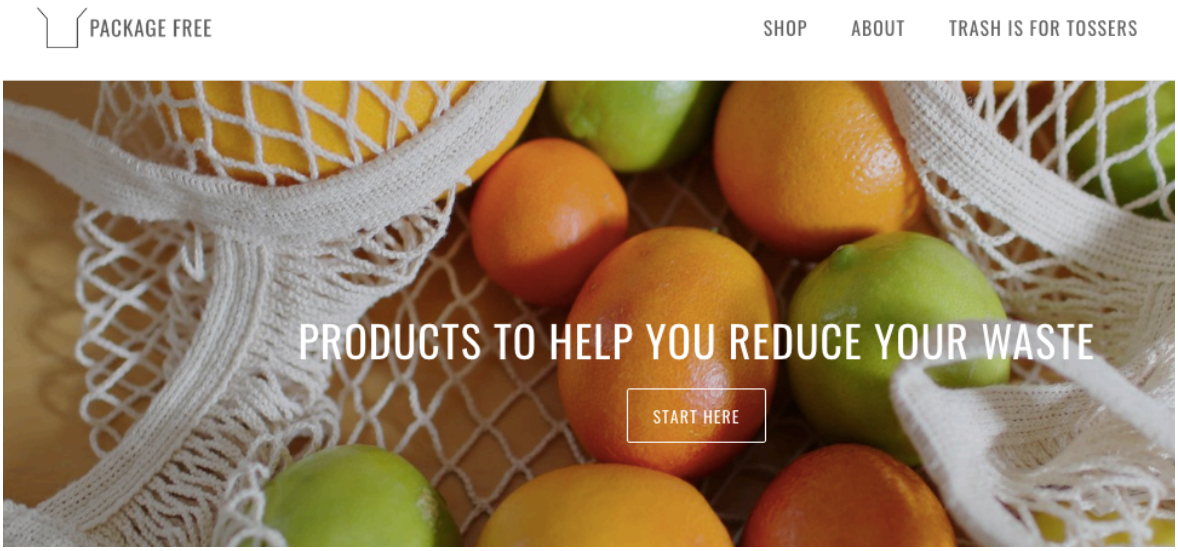


Figure 31. Package Free website

Other smaller noteworthy brands located in North America and Europe generally followed the same visual trends as the major competitors.

Fullbar, in Witten, Germany uses different weights of the same condensed sans-serif typeface, but with a slightly weathered or distressed treatment. Their website features many high-resolution, full-page photographs of bulk foods. Use of full-page, high-resolution photographs are common throughout. Colors are limited to bright orange, red, black, and white.

Loco, in Montreal, Canada, makes use of a fun and bright color system and flat design with a family of line-based icons. Their logo also relies on thin lines and presents a lively mix of colors on each capital sans-serif letter. The Loco website, like many of the other competitors' sites, presents a simple and centered design with plenty of white space.

The bulk food store, Novo, in Bozen, Italy presents a unique and highly dynamic living brand. Their logo can be re-arranged in a variety of positions, as is seen on their website, www.novo.bz. Each letter of the wordmark dances in varied typefaces. Their mission focuses on inclusion, openness, and responsibility, reducing waste by eliminating packaging and allowing customers to buy only the amounts they need. They carry a large range of fresh and dried goods and household products. The Novo color system includes neutral and natural tones of muted purple, yellow-orange, and green. Their look and feel also incorporates hand drawn typography paired with black and white photography of products as can be seen in Figure 32.

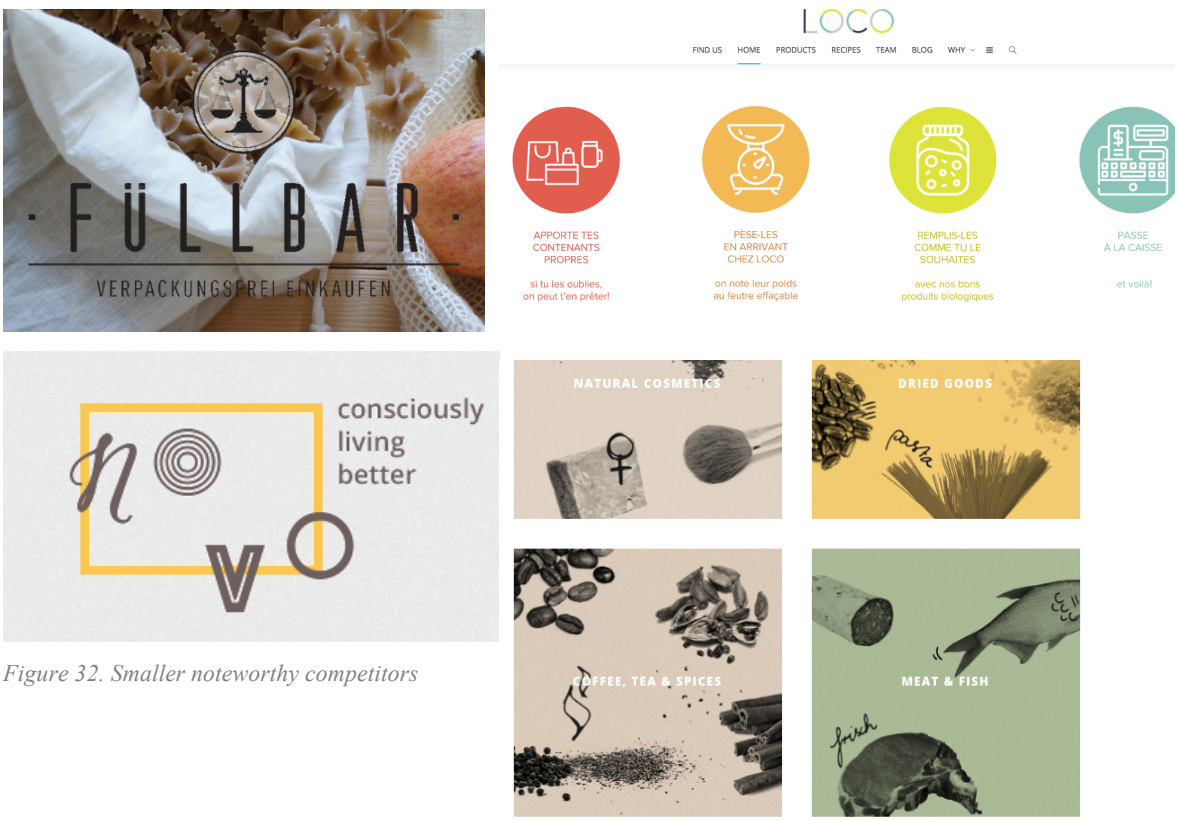


Figure 32. Smaller noteworthy competitors

Original Unverpakt, a package-free store based in Berlin, Germany, takes a more straightforward approach. Their simple logo is emblem-like in a red square with reversed-out white rounded sans-serif typography. The red is carried throughout the brand, although sometimes paired with pastel pink, green, or blue. Their website uses a similar sans-serif typeface with a lot of clean grid systems and white space. However, their illustrations appear organic and hand-drawn.

Figure 33. Original Unverpakt website

Ceci&cela has two locations in Toulouse, France. Simple round lowercase sans-serif type makes up the ceci&cela logo, which translates to “this&that.” It can also appear as a simpler logomark of “C&C,” as can be seen on the storefront signage. Their website employs a more condensed sans-serif that usually appears in all caps. The color system primarily uses a bright blue-green with secondary colors in green, pink, yellow, and light blue. Hand-drawn line illustrations act as icons for their types of goods and services. Their mission focuses on ethicality, locality, and health.

Figure 34. Ceci & Cela website

None of the competitors use a technologically-advanced bulk buying system with product tracking, logistical improvements, and branded reusable packaging. Therefore, the competitive edge of Green Grains is that it makes it easy for stores and customers to live waste-free or reduce their waste. The *onliness statement* was defined as “Green Grains Market is the only bulk food store that has an easy buying system for eco-conscious consumers in Europe and the US who want to produce less waste during an increasing global trash crisis.” Additionally, in order to clarify the company’s core values, competitive advantage, and unifying concept, a tagline was written as “Waste-free made easy.” A *brand brief schematic*, seen on the following page, outlines the company’s mission and positioning. The “big idea” unifying the brand is the reduction of packaging waste (Wheeler, 2009, p. 121).

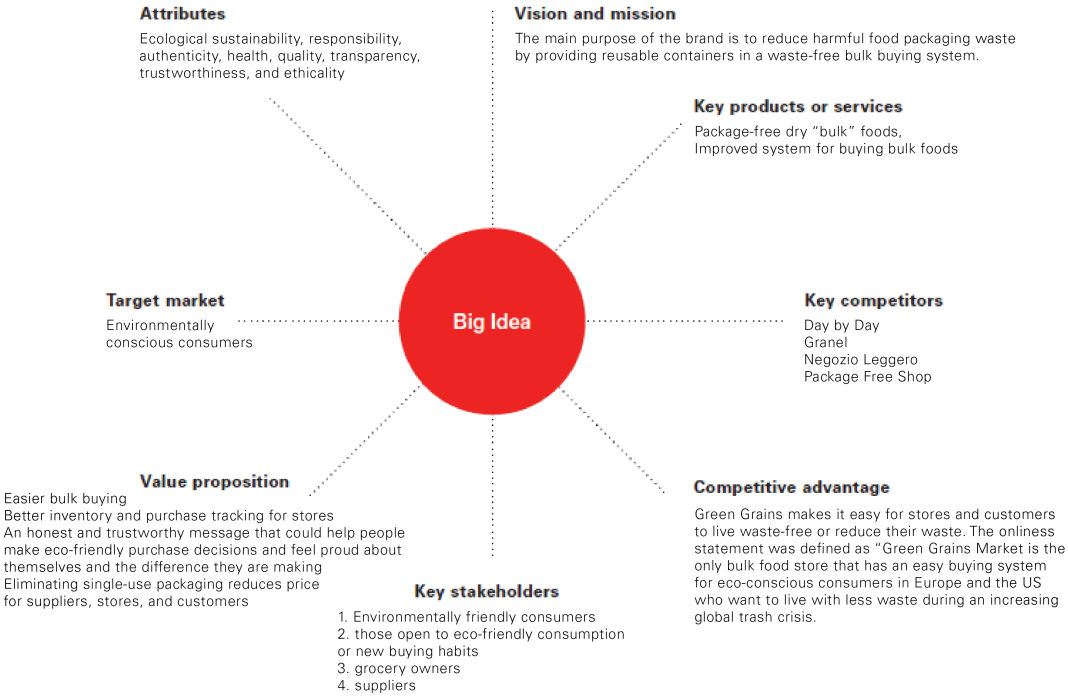


Chart 1. Brand brief schematic adapted from Wheeler, 2009, p. 121

The creation of the visual identity also revolved around the brand's values and purpose. As mentioned in the literature review, people most often associate natural, organic, and ecological goods with the color green and earth tones. Reflecting these findings, a color palette was developed with the help of Adobe Color CC. The brand's main colors are analogous, stemming from green, as seen in Figure 35. The exact values of this set of colors are as follows: the light tan is C:16.8%, M:12.89%, Y:60.94%, K:0%; the light yellow-green is C:36.72%, M:27.73%, Y:98.44%, K:2.73%; the light green is C:59.38%, M:31.64%, Y:100%, K:12.89%; the dark green is C:74.22%, M:42.19%, Y:96.09%, K:39.06%; and the dark brown-green consists of C:61.72%, M:60.16%, Y:78.91%, K:67.58%.

Figure 35. Brand Color Palette

Moodboards were created for the look and feel of the brand as well as the logo. A number of visual databases were mined, including Google Images and the Behance portfolio network. Visual references were chosen based on their brands' themes, with specific focus on eco-sustainable packaging and organic and natural shapes. Visual similarities between images were identified, grouping the images into 8 distinct moodboards, Figures 36-43.

Figure 36. Moodboard 1

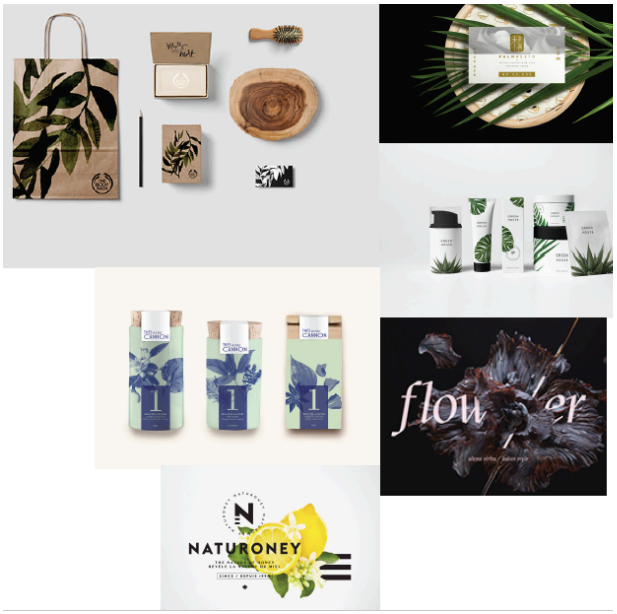


Figure 37. Moodboard 2

Figure 38. Moodboard 3

Figure 39. Moodboard 4

Figure 40. Moodboard 5

Figure 41. Moodboard 6

Figure 42. Moodboard 7

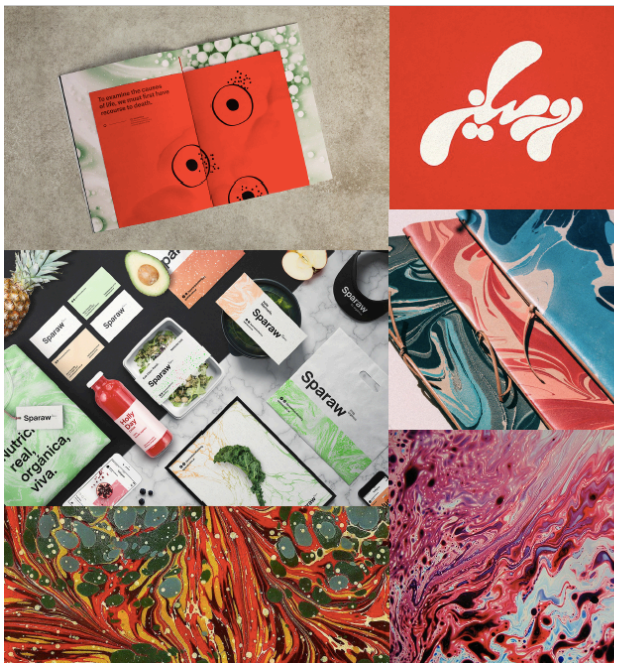


Figure 43. Moodboard 8

Moodboard 1 featured designs that make use of vintage-style botanical illustrations. Typefaces are simple, but sometimes intertwined with the plant images. Taking a more contemporary approach, Moodboard 2 includes packaging designs with tropical plants, watercolor illustrations, and experimental typography that interacts even more with the leafy imagery. The third moodboard gains an organic feel from unbleached

paper backgrounds and hand-drawn or painted patterns. The colors and many lively patterns give a fun and dynamic feeling. Moodboard 4 takes a simple approach, perhaps signaling purity. These food packages use script typefaces in solid white or black with very few illustrative elements and emphasis on the packages' contents. The designs in Moodboard 5 all make use of abstract organic shapes with sans-serif and contemporary type treatments. Colors of each brand are limited to single shades or black and white. In Moodboard 6, the designs employ bright, bold colors and clean graphic patterns on unbleached cardstock. Typography is large, bold, and usually sans-serif. Moodboard 7 doesn't necessarily suggest natural goods, but the fun bright colors and detailed line illustrations work well with food packaging. Finally, the last moodboard pairs simple sans-serif typefaces such as Helvetica with flowing, organic shapes and bright colors.

3.3.6 Logo Development

Figure 44. Logo sketches

In designing logos and determining the brand's look and feel, more visual research was required. Different types of logomarks were considered: wordmarks, letterforms, emblems, pictorial marks, and abstract or symbolic marks. Difficult to successfully design, abstract marks were largely dismissed as they are better suited for large companies with many divisions. Emblems, or logos embedded within imagery, were also mostly avoided, since they present legibility issues when scaled to small sizes (Wheeler, 2009, p. 62). The logo design process began with two pages of pencil sketches, see Figure 44. Again, Google Images and Behance were used for references. Specifically, searches were conducted to find different ways of representing wheat and grain to match the chosen

name of Green Grains Market. Due to the visual similarity of the words ‘green’ and ‘grain,’ the ‘s’ in ‘Grains’ was dropped in many of the logo sketches, and the brand name was slightly modified to “Green Grain Market.” Next, the best logo sketches were chosen and digitized in Adobe Illustrator. Logo iterations stemmed from experimentation in typography choices, color combinations from the chosen palette, and placement and size of design elements. Screenshots of the process can be seen in Figures 45 through 46. The first round of logo sketches consisted of ten main options, as seen in Figure 47.

Figure 45. Logo iterations

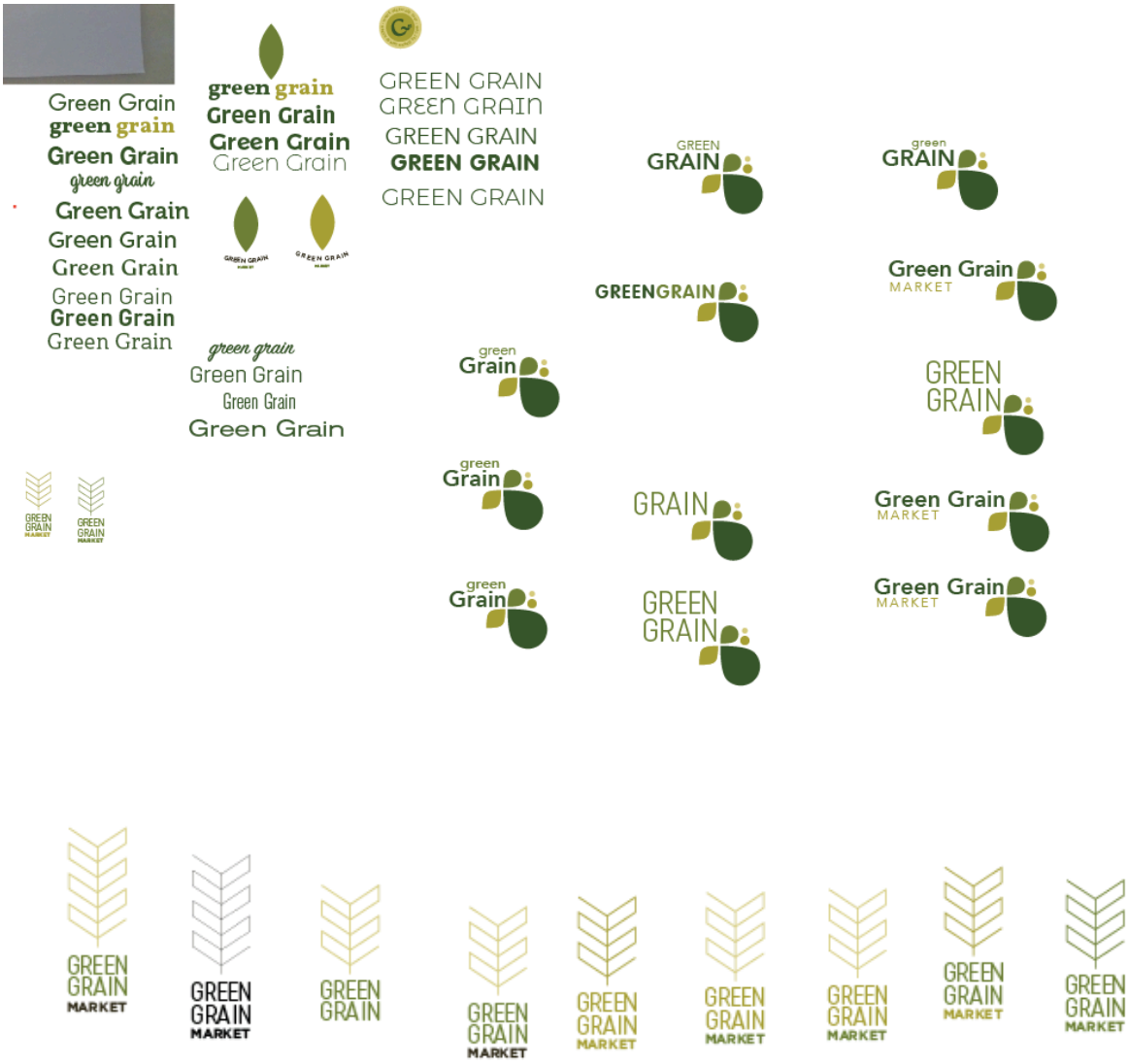
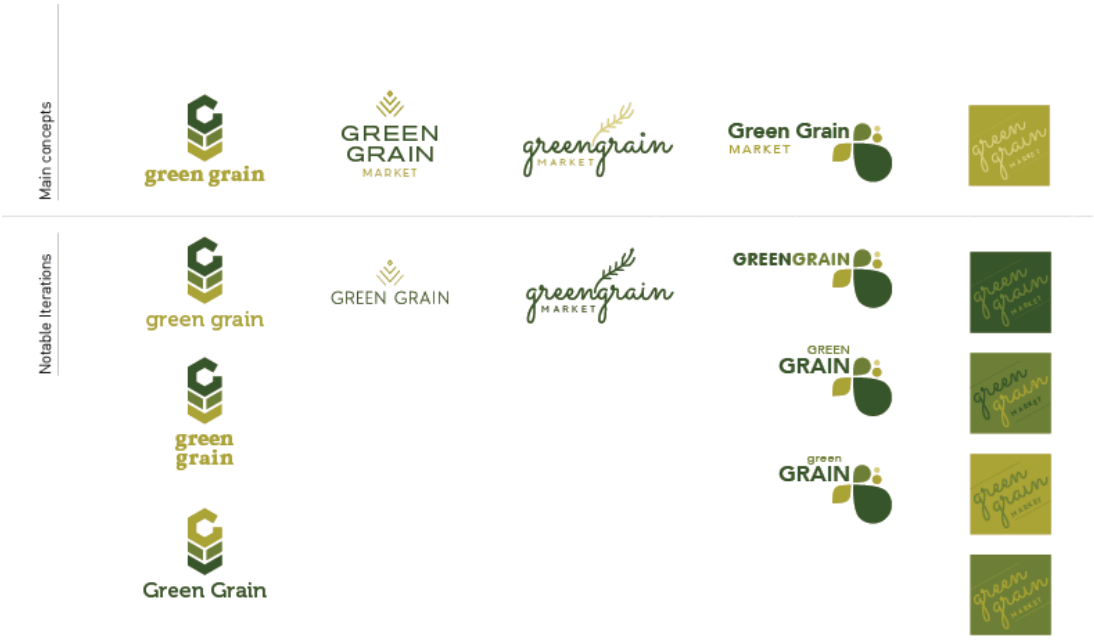


Figure 46. Logo iterations

Page 1



Page 2

Figure 47. Logo concepts presented

These ten logo concepts were presented to three IADE design professors, a fellow design and visual culture master's student and a marketing professional for critique and suggestions. They were also posted to a LinkedIn network and Behance network consisting mostly of visual designers. One professor advised that the logo concepts were too obvious, since their iconography all centered around grains and the color palette contained only shades of green. The marketer, however, encouraged the use of immediately apparent imagery to quickly convey the company's purpose. His favorites

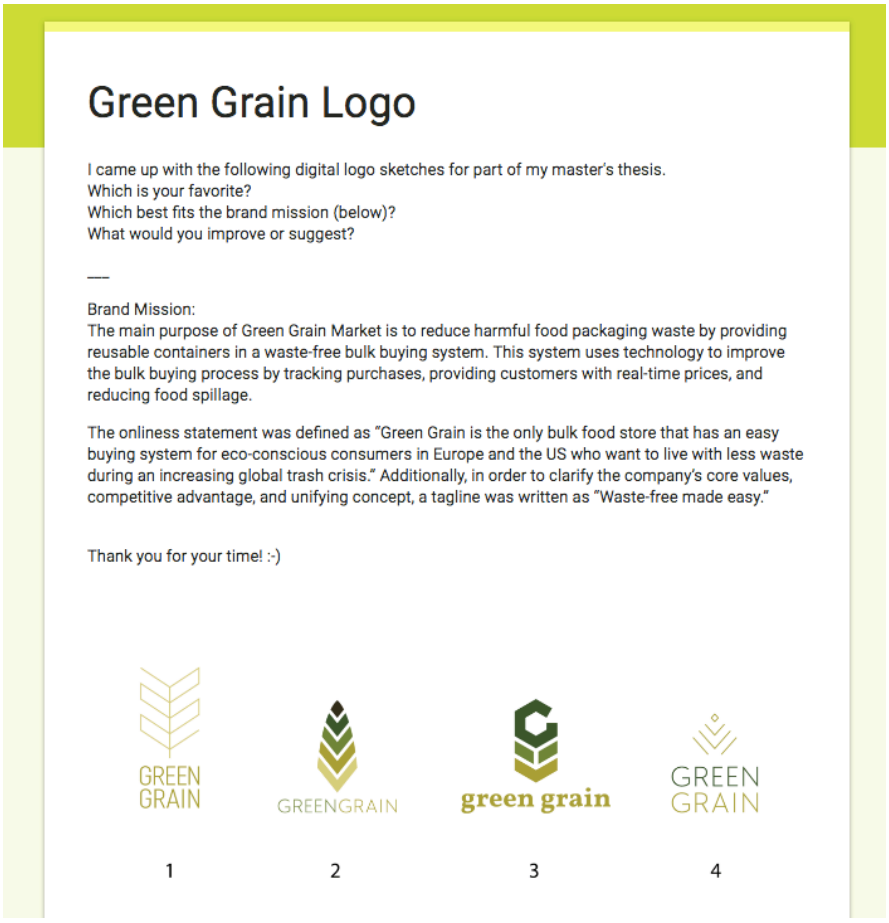
were the first and fifth logos on the first page, and he advised against the first on the second page because it gave off an industrial feeling (see Figure 47). They both came to the consensus that the logo sketches generally appeared a bit too clean and corporate in style. These useful insights went into the later refinement of the logo design. Visual methods for making more natural, organic designs were considered. Specifically, the use of distressed effects was tested. The results can be seen in Figure 53.

From the feedback gained on LinkedIn and Behance, via classroom discussions, and through email with design professors, the most successful logos were chosen. IADE's Co-coordinator of the Masters in Branding and Fashion Design commented through email that he liked the first, second, and fourth logos on the first page and the first from second page best because they appeared more connected with technology. A Columbian art director and photographer on the Behance network also preferred the first logo because of its clear connection with agriculture. On LinkedIn, two master's students in IADE's Design and Visual Culture program agreed that they liked the first logo of the second page best because it is "all about providing reusable containers and its symbol is the combination of containers, grain, and the letter G's shape." For the same reasons, they also liked the first two on the first page, but concluded that the first on the second page had a more powerful visual impact. A graphic designer and illustrator on LinkedIn commented that she liked the very first logo the best and the third one the least because of its lack of immediate legibility. An artist and gallery owner also shared her input, stating that she preferred the second logo on the first page since it was easy to read and the design was "clever and pleasing." A fellow student in the Design and Visual Culture master's program also picked this second logo as her favorite in an in-person critique.

Lastly, the ten initial logos were shared with my advisor for feedback and discussion. One of her favorites was the first logo because of its use of the Gestalt principles, although she suggested the removal of the word "market" because it appeared too heavy. She thought the second was a little too conservative. For the fourth logo, she advised making the leaf illustration more mature and removing the word "market." The fifth was well received, but would work better as a symbol for a well-established company. Similar to the marketer, she found the first on the second page a little too industrial, but she liked it. The second logo on this second page was also her favorite, but she suggested trying the iteration below it with the wording in two lines, since she liked the proportions of it better. This logo was edited as seen in Figure 48, and the revised version went into the subsequent poll. Finally, she liked the second to last logo, but thought there were stronger

ones because the drop or grain shapes were too large and overpowering. From all of these different channels of input, the four most well-received logos were chosen.

Figure 48. Logo revisions



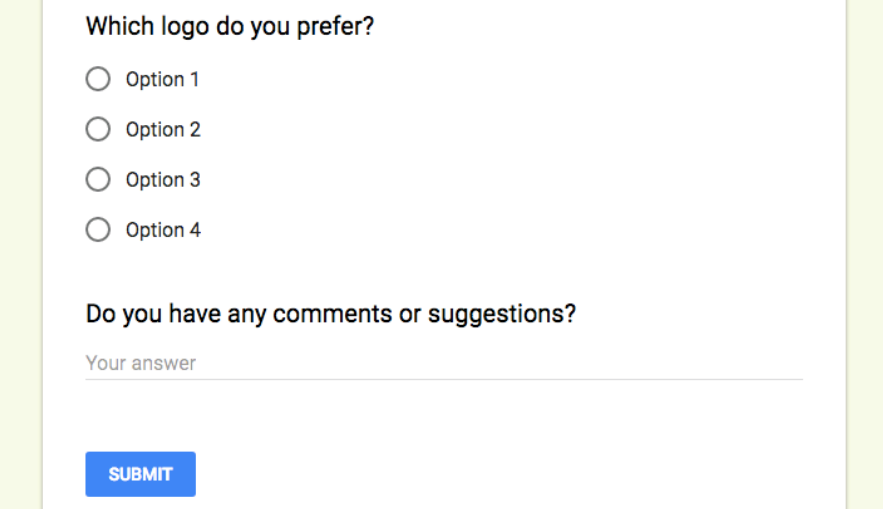


Figure 49. Logo poll

A Google poll was created to test which of the four logos had the greatest potential. It first explained the brand mission and then asked participants which logo they preferred. Comments and suggestions were also allowed. This poll, seen in Figure 50, was shared on Facebook, LinkedIn and Instagram, and was open for 24 hours with a total of 53 responses. The results showed a preference for logo 2, with 47.2% of the votes. The comments and suggestions of participants in Figure 51 were also taken into account in refining this second logo for use.

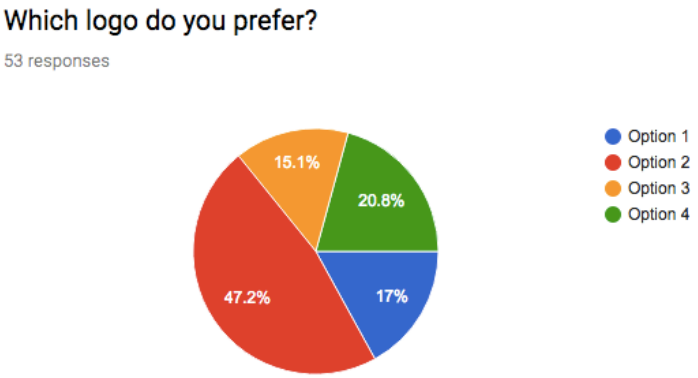


Figure 50. Logo poll results

Do you have any comments or suggestions?

9 responses

I like the simple design of the first one but I did like the bolder color scheme of 2&3
i love u arielle
Maybe the typo could be a bit bolder? Also like the first logo almost as much and think its shape is more adaptable :)
I really like both 2 and 3. I prefer option 2 for the font and the gradient of the colors on the leaf but i prefer how the leaf is drawn in optio 3 (ditch the G on top).
I thought the G in option 3 could be clarified more; the 'inner hook' of it is not defined enough to identify as a G
I absolutely love the 3, id love to test a bold or medium sans serif like the 2 with the symbol though
the typeface on option 3 is my least favorite but I like that top of the logo is kind of a container.
I like number 2 as well, but I don't think there's enough separation between "green" and "grain"
I like the second logo too :)

Figure 51. Logo poll feedback

Figure 52. Logo refinement

The logo was then refined and edited in Adobe Illustrator. A grid system, seen in Figure 52, was created to align all of the symbol's elements so that the width of each white space was equal to half of the width of each colored bar. The type was also modified, first starting with the typeface Neutraface 2 in the weight "text." The angles of the "N" and "R" tails were adjusted to match the angles in the icon above. The "G", "R," and "A" were all modified slightly so that the height of the crossbar fit into the grid system. The kerning was also manually adjusted for even spacing as well as even centering. The words "Green" and "Grain" were kerned so that they would take up the same amount of horizontal space. This

also required cutting the arms of each letter “E” slightly. A screenshot of the process can be seen in Figure 52. Lastly, the logo was given a textured treatment to appear more natural. This effect was created by using an Adobe Illustrator extension texture pack called VectorPress designed by Ian Barnard. A number of texture iterations were tested, as can be seen in Figure 53. These four options were presented to my advisor and a marketing professional, and they both agreed that the first was the most visible without being overpowering. This first logo of Figure 53 was chosen as the official logo, with the un-textured version as an alternative iteration to be used in different applications.

Figure 53. Logo texture iterations

Figure 54. T-shirts

3.3.7 Production

The final logo was applied to a number of brand touchpoints including tote bags, business cards, packaging labels, dispenser labels, t-shirts, aprons, paper bags, boxes, and patterned gift wrap. Canvas bags and plain white t-shirts were provided by the screen-printing department at IADE. A beige apron was purchased from H&M Home. The logo was reduced to a single-color transparency for screen-printing and a screen was burnt with different sizes of the logo on it. With the assistance of Professor João Flecha, green and yellow ochre paint were mixed to match the dark green of C:74.22%, M:42.19%,

Y:96.09%, K:39.06%. The first few prints were too bright green, so more yellow and a little red was added to the mixture. The apron was printed simply with the logo large on the front. The front of two small t-shirts and three medium t-shirts were also screen-printed with the logo. On some of the shirts, the logo was placed large and in the center, and on others, it appears small in the top left corner as seen in Figure 54. On the backs of some of the t-shirts, the logomark appears without the wording, and a few of these were tested with an experimental combination of colors. One of the t-shirts contains a full-color logomark on the back that was printed from an Adobe Illustrator file and ironed-on using transfer paper. The fronts of seven tan tote bags were then screen-printed with the logo large in the center of the bags. The backs of the bags were designed in Adobe Illustrator in full color and were printed using iron-on transfer paper. The development of the designs for the backs of the bags can be seen in Figure 55. These iterations were shared with my advisor, and the best were chosen to be applied to the backs of the bags. The final printed tote bags can be seen in Figure 56.

Figure 55. Bag pattern iterations

The creation of the packaging involved much printing, cutting, and manual assembly. Four glass jars were purchased from Pollux, a home goods store. They were chosen based on their appearance, their sizes relative to the dispenser, and their simple, durable, and ecological materials: glass and metal. Two thicknesses of textured, recycled A4 paper were purchased at Ponto das Artes Chiado for the printing of labels for the dispenser and packaging. Small round labels were designed in Adobe Illustrator containing only the logo, optically-centered and in full color. These round labels were printed on the thicker of the recycled papers, then cut and adhered to the tops of the jars and the paper box with double-sided clear tape. The design file for these labels can be seen in Figure 57. The thinner textured paper was also cut to fit the size of the top of the scale to match the

dispenser label and to provide some traction so that the jars wouldn't slip when placed on top of it. This circle of paper was adhered with double sided tape and the scale's logo was removed with Sephora extra strength nail polish remover, as can be seen in Figure 58.

Figure 56. Printed bags

Figure 57. Labels

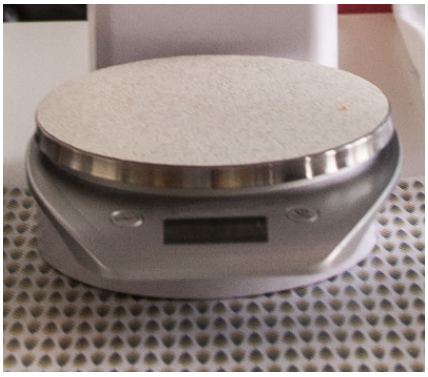


Figure 58. Modified scale

To fill the dispenser, Dennree brand organic cornflakes were purchased from Go Natural. Using the ingredient information of these cornflakes, two label iterations were designed, as seen in Figure 59. The first label design on the left was chosen, since the second contained watermarks of the logomark that added a little too much visual clutter and hindered legibility. Keeping in mind the findings from observational data, all of the ingredients were listed in clearly legible 14pt Neutraface 2, in text weight in the light green of the brand's color palette. The title of the dispenser's ingredients was set in bold 24pt Neutraface 2 in the brand's dark green-brown. Since customers often requested this information in the field observations, the origin of the food was placed at the bottom of the label in 10pt Neutraface 2 text weight in all caps in the brand's light yellow-green to create a hierarchy of information. The dispenser label was designed in Illustrator, printed on the thinner textured A4 paper, and placed on the front center of the dispenser using double-sided tape.

Figure 59. Dispenser label iterations

An ideal model of the dispenser was created for display purposes in Adobe Photoshop. Due to limitations of budget and resources, a pre-made dispenser was purchased and no wood versions were available. A number of wood textures were gathered from free internet databases and tested as seen in Figure 60. The best and most realistic of them was chosen and overlaid using the Color Burn transparency. The final visual model, Figure 61, was printed on A3 paper and placed next to the dispenser during validation testing.

Figure 60. Dispenser iterations

Figure 61. Final dispenser model

In addition to the jars, paper bags and boxes were also designed. The basic brown paper bags were purchased in the gift wrap section of Continente. However, they were shaped to fit wine bottles, so they needed to be modified to fit the dispenser by cutting off the top handles and top portion of the bag using an exacto knife and self-healing mat. Since they could not fit into a normal printer, the logomark designs on these were hand-painted. Amsterdam brand acrylic paints in Yellow Ochre, Olive Green Light, Naples Yellow

Deep, and Sap Green were purchased from Ponto das Artes Chiado and hand-mixed to match the brand's color palette. A transparency sheet left over from screenprinting was cut out into a stencil. The first attempt to paint the logomark using only this stencil resulted in unclear lines and misplaced paint, so a new painting method was established. The stencil was placed over part of each bag and temporarily adhered with masking tape. Its shape was outlined in thin pencil that was slightly erased so as not to be noticeable. Each bag was then carefully hand painted with new Raphael brand brushes in sizes 6, 8, and 4. The paper box was painted in the same manner, but with the logomark intentionally continuing from one side of the box to the next. One of the round labels was also adhered to the top of it with double-sided tape, and the lip of the box was painted in the brand's dark green-brown. The final painted bags and box can be seen in Figure 62. Unfortunately, the final type of packaging, round bottom bags, were not available to be purchased after searching many stores and online vendors.

Figure 62. Paper bags and box

Business cards and gift wrap were designed as additional brand collateral. The business cards featured a pattern on the back similar to one of the tote bags. The fronts contained the company logo and temporary placeholder information with my name, phone number, and email address. They were printed double-sided on the thicker recycled, textured paper and cut by hand with an exacto knife and self-healing mat. The finished business cards can be seen in Figure 63. The gift wrap simply used a smaller version of the same pattern and was printed on A3 paper. A small box was wrapped in it to show it in use, as seen in Figure 64. A sheet of the gift wrap was also placed beneath the dispenser during validation testing.

Figure 63. Business cards

Figure 64. Gift wrap

In addition to the brand collateral, an infographic was created to further drive home the brand's message and to encourage people to waste less plastic packaging. Data about municipal waste streams, recycling rates, and packaging materials was collected from Eurostat's online database (Eurostat, 2017). The amounts of plastic particles in marine animals and water bodies were gathered from OSPAR (OSPAR). The amounts of emissions caused by the extraction and production of various materials were sourced from the US EPA (EPA, 2016). Data on the growth of plastic production and the presence of plastics in shellfish came from World Bank and PlasticsEurope (Lusher, Hollman, & Mendoza-Hill). Consultic provided information on the landfill rates of plastic across different European countries (Consultic, 2015). Data about the amounts of plastic particles in tapwater was pulled from an academic paper by Orb Media (Tyree & Morrison).

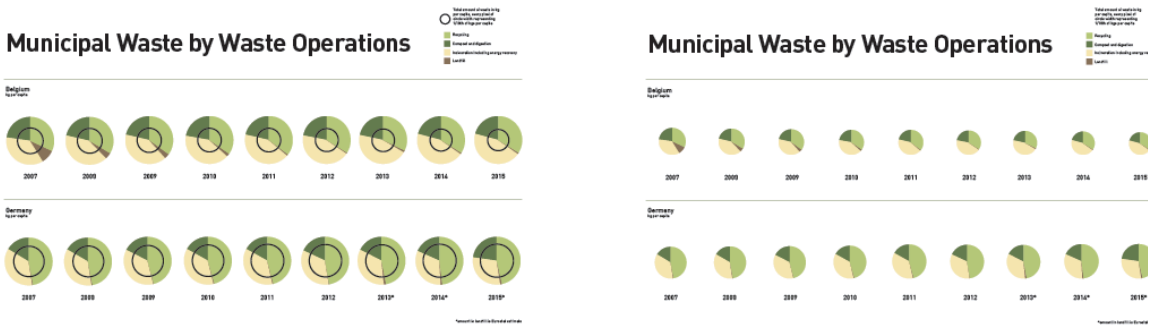


Figure 65. Municipal waste graphs

The infographic, titled "The Problem with Plastic" aims to tell the story of this harmful material from extraction to waste streams to particles in human food and drinking water. First, a number of visual representations of waste streams were tested. In Figure

65, the charts on the right show the total amount of waste represented by the size of pie charts placed year-by-year horizontally. Two countries' data was compared vertically in rows. Each pie chart could be broken down into the amount of municipal waste going into the following waste streams: recycling, composting, incineration including energy recovery, and landfill. Since the changes in total amount of waste were only slight and not immediately apparent, another method of representing this data was tested on the left-hand charts of Figure 65. In these, a black outlined circle overlaid on the pie charts changes size based on the total amount of municipal waste. The pie charts remain the same size so that the percentages of each waste stream can be more easily compared. However, this data visualization still didn't clearly and immediately communicate changes in the amounts of waste entering each waste stream by country. Yet another method was tested. In Figure 66, the same information was shown in area charts. In this way, each country could be compared side by side to easily note the amount of waste going into each waste stream. The colors were chosen to match the brand, but later changed because the infographic theme of plastic didn't match the natural palette. The initial typeface used was DIN because of its easy legibility and range of weights.

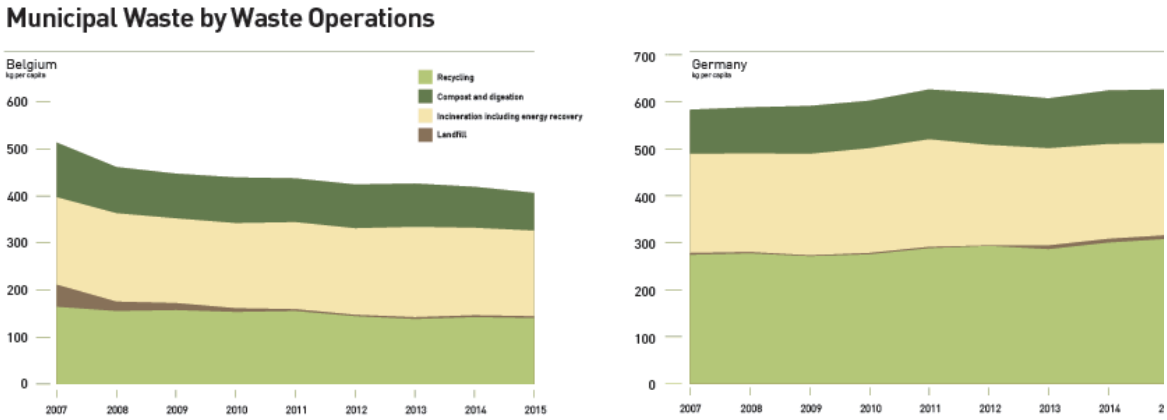


Figure 66. Municipal waste area graphs

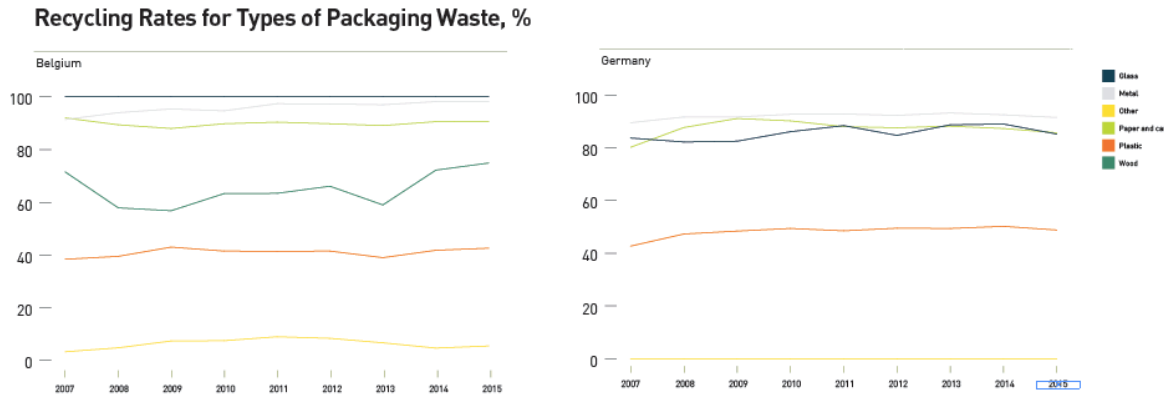


Figure 67. Recycling rates charts

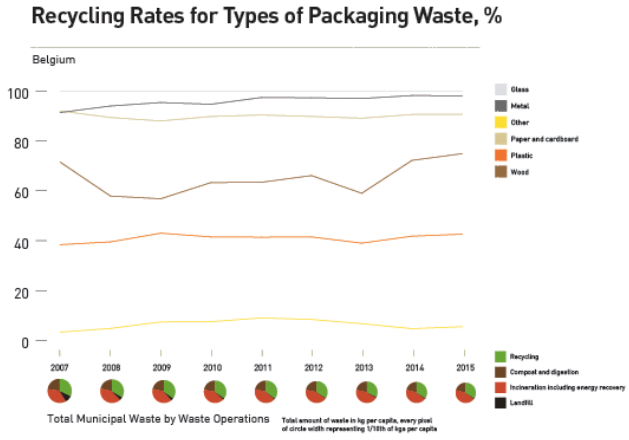


Figure 68. Combined chart

Next, the types of materials of packaging waste were compared according to their recycling rates. Each type of material (glass, metal, other, paper and cardboard, plastic, and wood) required its own new and unique color to differentiate it from the information about waste streams, so a new bright palette was developed. The best way to show the

change in percentage of material recycling rates over time was through the use of line charts. Each countries' recycling rates could then be compared side-by-side, as seen in Figure 67. In an attempt to compare both sets of information about material recycling rates and waste entering municipal waste streams, Figure 68 was created. This visualization was discarded however, since it used differently sized pie charts that were not easy to compare.

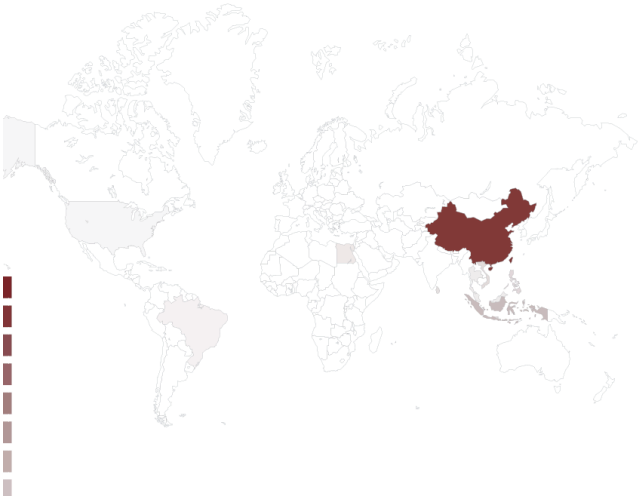


Figure 69. World map

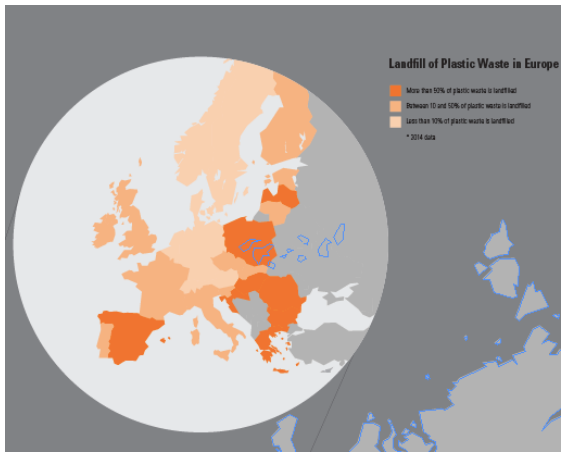


Figure 70. Plastic waste in Europe

To tie together all of the geographical and statistical information, a world map was designed (Figure 69). In this map, data about mismanaged plastic waste was illustrated by color coding countries according to the amount of plastic they dump into the ocean. Most countries lacked any information on this and were therefore left blank. The more plastic a country dumped into the ocean, the darker a shade of red it appeared. A close-up section of Europe was added that showed the amount of plastic that European countries dumped into landfills in 2014. Each country was shaded with a certain percentage of orange; the darker orange they appeared, the more plastic they landfilled. The colors of the whole infographic were changed to a grey background with shades of grey, and bright orange to highlight the most important information. The color bright orange was chosen to represent plastic throughout its lifecycle because it stood out against shades of grey and didn't occur often in nature. The typeface was changed to various weights of Univers Condensed for clarity and to save space.

In order to tell a story, the infographic was expanded to include information about the entire lifecycle of plastics. This began with creating a line chart and scatter plot of the amount of plastic produced worldwide per year from 1950 to 2013. Figure 71 showed this

upward curving trend. The orange line representing plastics continued via a dotted line and arrow connecting this chart to the next one.

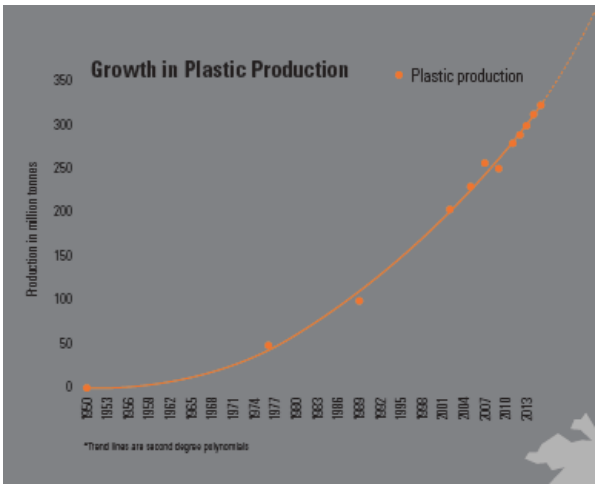


Figure 71. Growth in Plastic Production

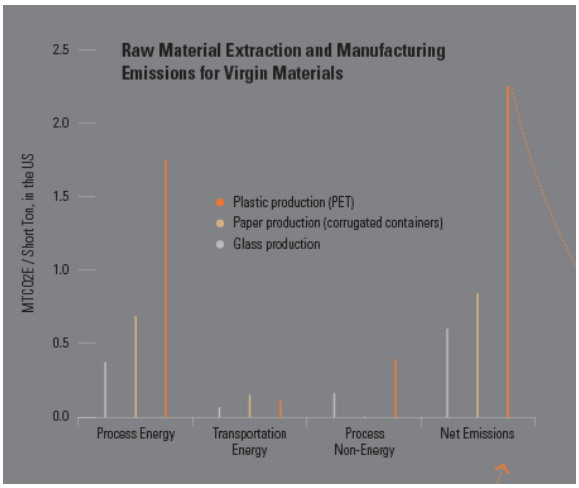


Figure 72. Emissions by material

The next chart was designed to show the difference in the amount of emissions produced during the extraction and production of different materials. The bar chart presents the number of millions of tons of CO2 that were released per short ton per substance in the US. Two new colors were introduced to represent the non-plastic materials: a light beige for paper, and a light grey for glass. The net emissions created by plastic were noticeably higher than for paper or glass, as seen in Figure 72. Again, the lifecycle of plastic can be followed along a dotted orange line and arrow connecting to the next chart.

Here, the previously designed chart of recycling rates was employed, but this time showing the rates for the entire EU. Paper and glass remained the same colors, while the new material of metal was introduced in dark grey, and wood was shown in brown. This line chart in Figure 73 makes immediately apparent the low recycling rate of plastics compared to other materials. Since all of these percentages only included recycling, the information in the graph flowed well into the next chart of municipal waste streams. To visualize this relationship, all of the lines representing recycling rates were extended as dark grey dotted lines and connected to the recycling segment of the next chart.

This next graph contextualized recycling as just one of many waste streams. Adapted from the earlier iterations seen in Figure 66, it tracked the amount of waste entering recycling, incineration, composting, and landfills over the course of 2007 to 2015 in all of Europe. Next, using a dark grey dotted line and arrow, a connection was formed

between the section of landfilled waste in the EU and the pop-out map of Europe with each countries' plastic landfill rates (Figure 70).

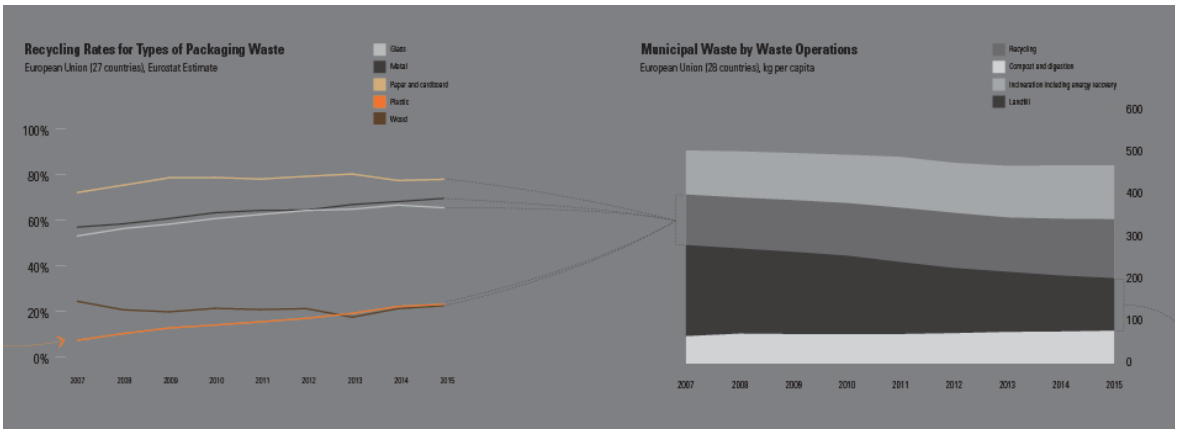


Figure 73. Recycling rates and waste streams

The world map was also edited to include information about the ways in which discarded plastic ultimately harms humans. As mismanaged plastic waste degrades, it forms smaller and smaller particles instead of decomposing. The amount of microplastics found in different water bodies was added to the map as blue bars. A darker blue shows the minimum number of plastic particles recorded per location, and the lighter blue represents the maximum amount recorded, as seen in the key in Figure 75. Figure 74 shows an example, a close-up of part of the map with the plastic particle number for the Great Lakes compared to that of the US South Atlantic coast. Subsequently, the percentage of tap water containing plastic micro-particles in cities throughout the world was shocking and disturbing. These percentages were visualized in pie charts, with the dark grey representing the percentage containing plastic and the light grey representing the percentage of tap water that was plastic-free. For example, a close-up in Figure 76 shows that Beirut's tap water almost always contains plastic particles, while New Delhi and Kampala have slightly less.

Figure 74

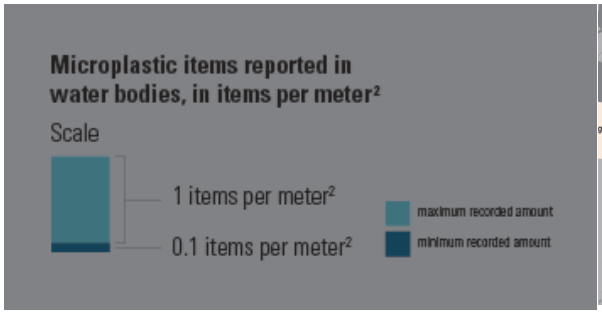


Figure 75. Microplastics in water bodies key

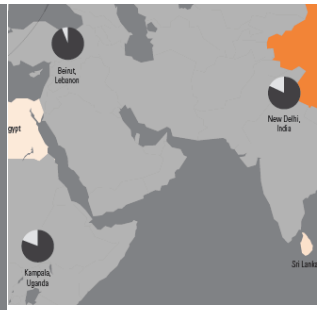


Figure 76. Plastic in tap water

The amount of plastic entering human food was also considered. A chart was created to compare the amounts of plastic particles in one gram of shellfish meant for human consumption. For each species, icons were designed and modified to work together visually as a family. The bar graph in Figure 77 was grouped by species, and color coded according the countries in which the shellfish were found (Lusher, Hollman, & Mendoza-Hill, p. 51).

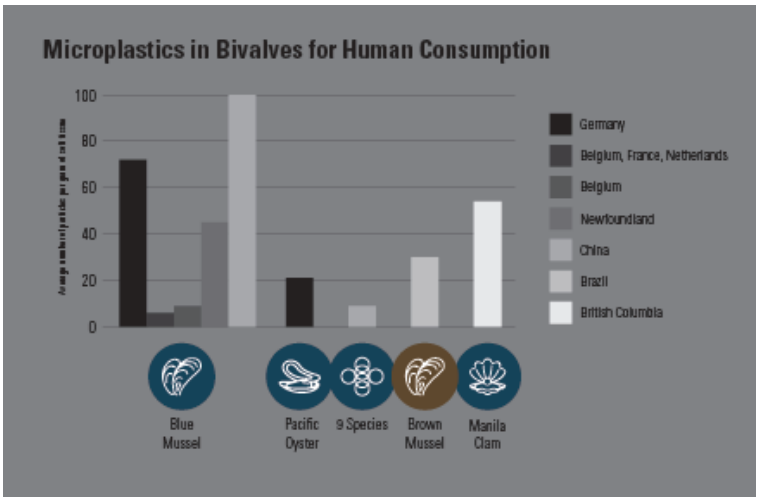


Figure 77. Microplastics in bivalves first draft

The full first-draft of the infographic, including all of the aforementioned charts, can be seen in Figure 78. It was presented to a design professor at IADE for critique and suggestions.

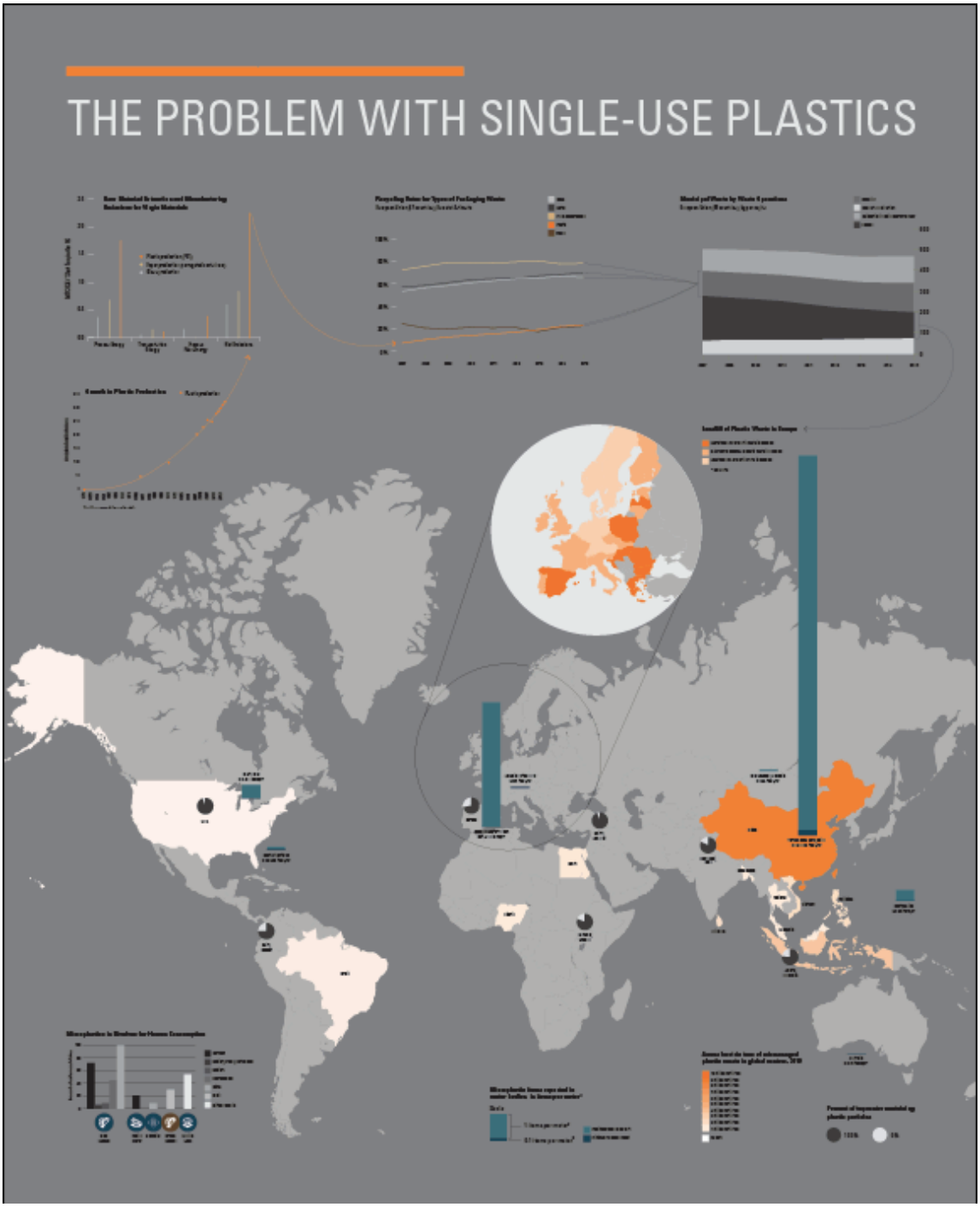


Figure 78. First draft full infographic

A number of modifications were suggested by the Professor and two fellow students in the Design and Visual Culture master's program. The professor recommended making the chart titles simpler and more understandable. More breathing room was added to the top of the poster and around all the charts. Two paragraphs were written as an introduction to the infographic, followed by the Green Grain logo and mission as a solution to the plastics problem. In this context, the logo was reduced to simple white

on the grey background. The entire infographic was reformatted to fit a 4x4 grid, so that it could be folded from an A1 sized poster into eighths. The charts above the world map were integrated more and placed in a separate shaded section to reduce the feeling that they were ‘floating’ on the page. All of the text was modified to match in style and size, and numbers were made smaller and lighter. The colors of the area chart at top right were reduced in contrast, except for the landfill and recycling sections, so that these would stand out the most. The background was lightened slightly to provide more contrast with the thin dotted lines and arrows connecting the charts. A wave pattern was overlaid on the blue bars on the map, to better and more quickly represent water bodies. A simple drop icon was added above each pie chart to make tap water data more recognizable. The chart about microplastics in shellfish was entirely removed so that the data bars could instead appear in their respective locations on the world map. The shellfish icons still accompanied them, but were reduced to one color (grey) to prevent unnecessary visual clutter. The whole infographic was re-titled to “The Problem with Plastic” and the title was placed in the top left corner to fill the visible space when the poster was folded into eighths.

Finally, a couple of additional color palettes were tested in an attempt to better match the Green Grain colors. These color iterations were shared with my advisor, and it was agreed that the second, shown in the center of Figure 79, was too green and perhaps misleading about the environmental harm of plastic. Therefore, the first and the third iterations, along with the grey version, were printed on A1 paper at Arco Iris Chiado and folded into eighths to be handed out during validation, as can be seen in Figure 80. The final grey iteration in Figure 81 was also printed on thicker A1 paper and hung on the wall during validation. The file for print (at a reduced size) is the second image in the Appendix, in the Project Photos section.

Figure 79. Final infographic iterations

Figure 80. Folded infographic posters

Figure 81. Infographic in use

3.4 Validation

Validation took place over the course of two days at the IADE Factory. Four tables were set up along the back wall with all of the brand materials: glass containers, paper bags, paper boxes, tote bags, t-shirts, gift wrap, business cards, infographic posters, and the dispenser filled with corn flakes. To round-out the look and feel of the brand, two cacti were purchased at Aki and included in the display. Brown paper tags and burlap string were also placed on the table to visualize how theoretical customers could create labels for their foods for home use. A couple of examples of this were set up using one small and one large glass jar. The large glass jar was filled with brown rice and the small was filled with red lentils, as seen in Figure 82. Labels were created for both jars using hand-written

text with a black felt-tip pen on the brown paper tags. The infographic poster was hung on the wall as well as the photoshopped model of the ideal wood-based dispenser. Because of the length of the demonstration, milk could not be provided to accompany the corn flakes as a snack for participants. Therefore, to add flavor, a glass shaker was cleaned, filled with a mixture of cinnamon and sugar, and tied with another brown label tag. Students who wanted a snack were encouraged to use aluminium cups to bring the cornflakes back to their tables. These cups could then be reused or recycled in a receptacle in the hallway directly outside of the classroom.

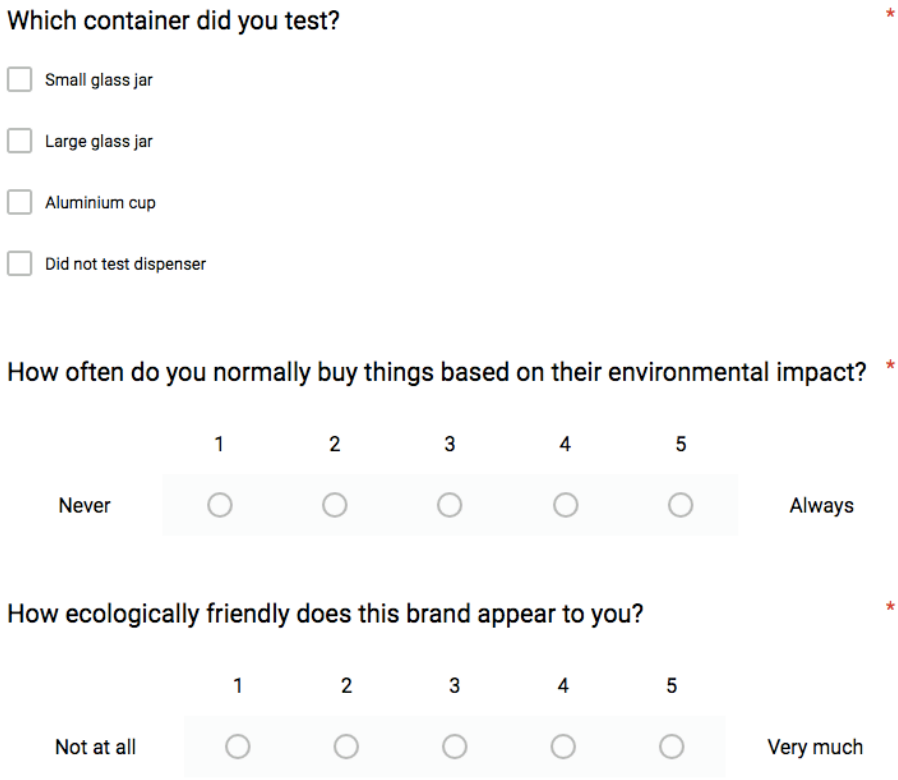
Figure 82. Filled containers with brown tags

Figure 83. Validation setup

Participants consisted of two classes of undergraduate students in the second year of Communication Design and the third year of Marketing at IADE. Each workshop was held for about 3 hours on May 7th and 8th, 2018. My advisor, Professor Maria Cadarso, was integral in allowing the validation to take place during her classes, introducing the demonstration, and encouraging students to come over and participate. Each student was given a description of the brand and its mission. They were instructed to try out the dispenser with a container of their choice. The infographic was explained in detail, and students were encouraged to read it up close and ask questions. They were then directed to fill out a questionnaire.

The questionnaire was developed using Google Forms, and was filled out on a MacBook Air. To begin creating this survey, a set of questions was presented to my advisor. These were intended to collect both quantitative and qualitative data, and most of them included a Likert scale. Some questions were refined, and a few more questions were added in order to focus more on the brand and visual identity than the product design. Specifically, a couple of questions were formulated to address color choices, presenting different iterations of the logo in new color palettes that were created in Adobe Illustrator. These questions can be seen in Figure 84. The first question of the survey addressed which container the participant tested, but some issues were faced in filling this question out on the first day because not every participant tested one of the listed containers. For the

second day, this question was modified slightly to include the answers “Did not test dispenser” and “Aluminum cup.” The full questionnaire, as it was presented to participants, can be seen in screenshots below in Figure 84. Questions with a red star next to them were required.



What do you relate the brand's colors with? *

Long answer text

Which color scheme appeals most to you? *

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5

Which color scheme appears the most eco-friendly? *

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5

How likely would you be to buy food using this system? *

	1	2	3	4	5	
Not at all likely	○	○	○	○	○	Very likely

How well do you think the brand reflects its mission (below)? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very well

Green Grain Misson

The main purpose of Green Grain Market is to reduce harmful food packaging waste by providing reusable containers in a waste-free bulk buying system. This system uses technology to improve the bulk buying process by tracking purchases, providing customers with real-time prices, and reducing food spillage.

How engaging did you find the brand's messaging? *

	1	2	3	4	5	
Not at all engaging	○	○	○	○	○	Very engaging

How does the brand make you feel?

Long answer text

How well did you understand the brand's concept? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very well

Do you think that widespread use of the Green Grain system would reduce *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Definitely

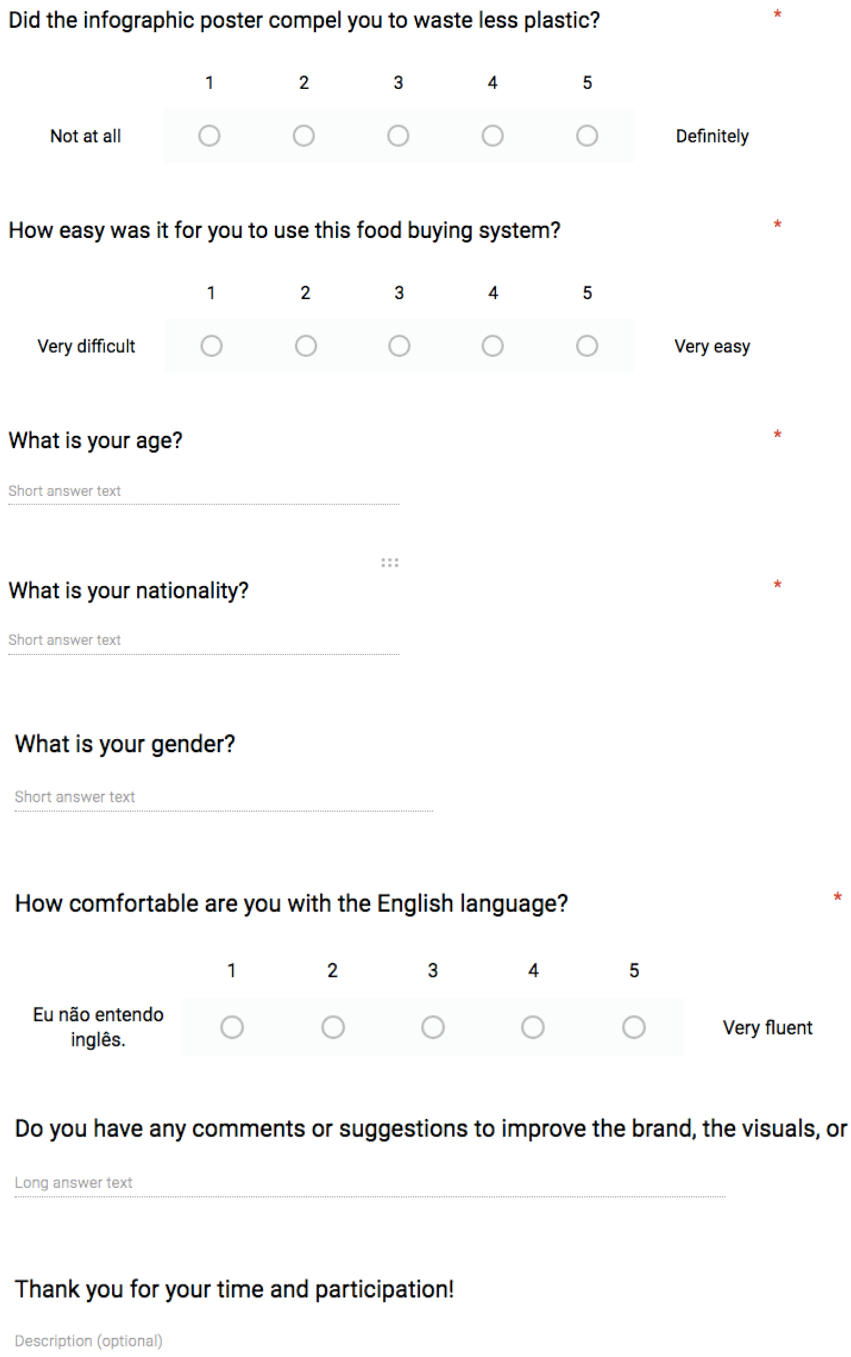


Figure 84. Survey

3.5 Results Analysis

The survey results provided consistent data that aligned well with the original hypothesis. A total of 66 unique responses were recorded, and from these, a number of charts and bar graphs were utilized to analyze trends in the data.

Some background information was collected about each of the respondents. Perhaps the most important piece of contextual data was the participant's understanding

of the English language. All explanations were given in English, and the survey was also written entirely in English. Because some students expressed concern over this, people who understood less of the language were accompanied by a colleague who could translate. Overall, as seen in Figure 85, comfort with the English language was generally high, but not perfect.

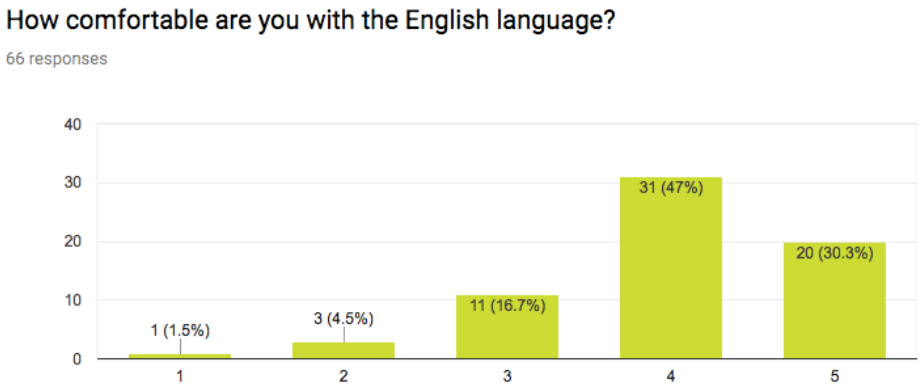


Figure 85. Comfort in English

Students were also asked their nationality, age, and gender. These fields were intentionally left open to allow for inclusivity, but this did lead to some difficulty in aggregating the data because the same answer could be stated in different ways by different people. Figure 86 shows the original answers collected about gender, and Figure 87 shows a revised version of the chart in which all of the same answers were grouped. The vast majority of participants were female – 42 were female while only 24 were male. The same problem with the open-ended answers was faced in the collection of nationalities as seen in Figure 88, but it was resolved in the same manner in Figure 89. Almost all of the respondents were Portuguese, but a few were from other countries. Both new charts were made in Microsoft Excel, while all of the originals were provided by Google Forms. Participants ages were also collected, and these ranged from 19 to 26 with the majority at age 21. A chart of their ages can be seen in Figure 90.

What is your gender?

64 responses

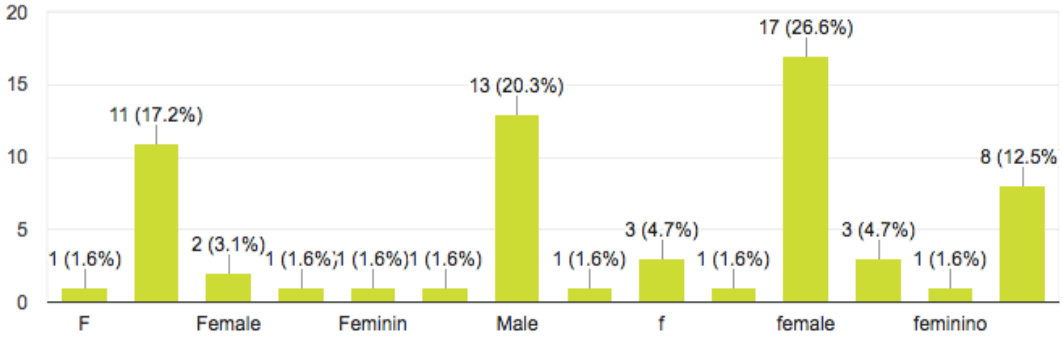


Figure 86. Gender results

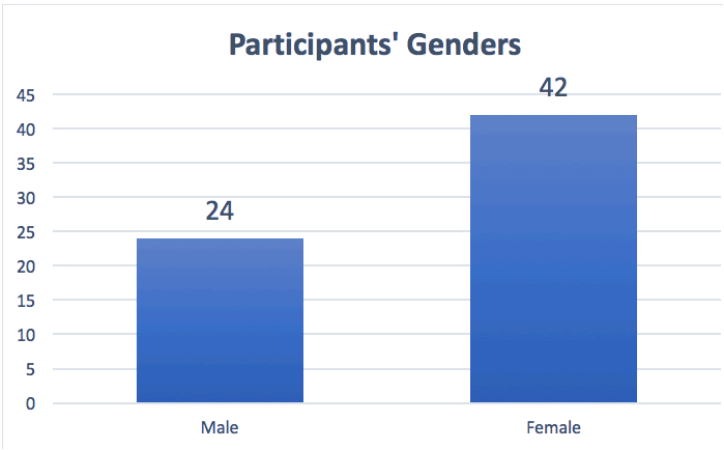


Figure 87. Gender chart

What is your nationality?

66 responses

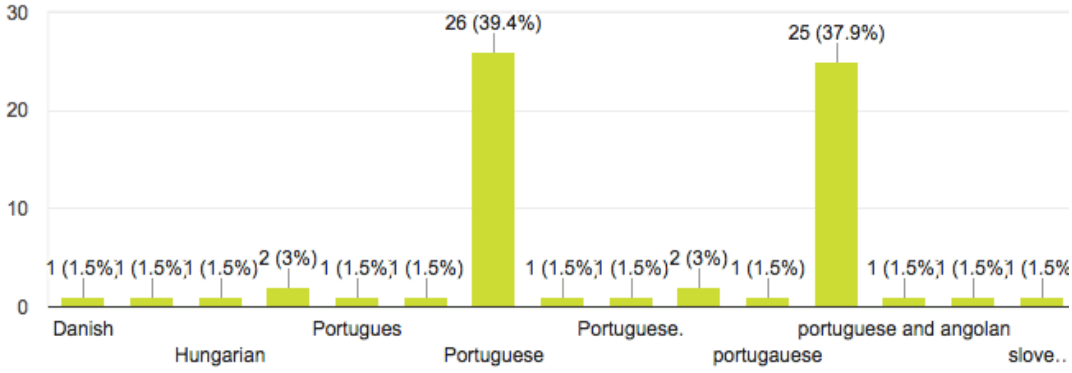


Figure 88. Nationality results

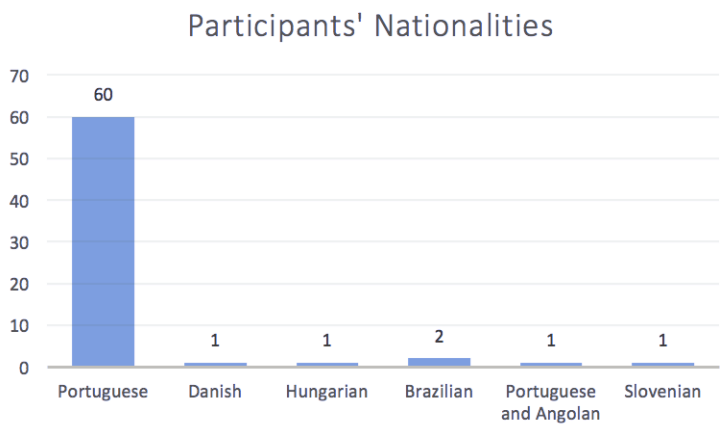


Figure 89. Nationalities chart

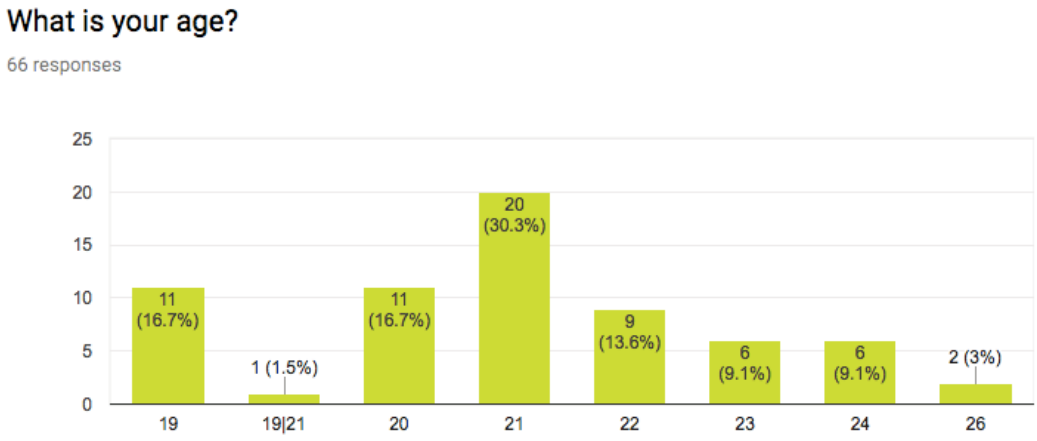


Figure 90. Participants' Ages

The first question in the survey asked which package participants used to test the dispenser. As seen in Figure 91, the majority of participants tested the small glass jar. However, as stated earlier, it must be noted that this particular question was edited on the second day to include the answers “Did not test dispenser” and “Aluminum cup.” This may explain why fewer students chose the answer “Aluminium cup.” Based on observation, it is very likely that more students would have put “Did not test dispenser” and “Aluminium cup” if they had been included as choices on the first day of testing.

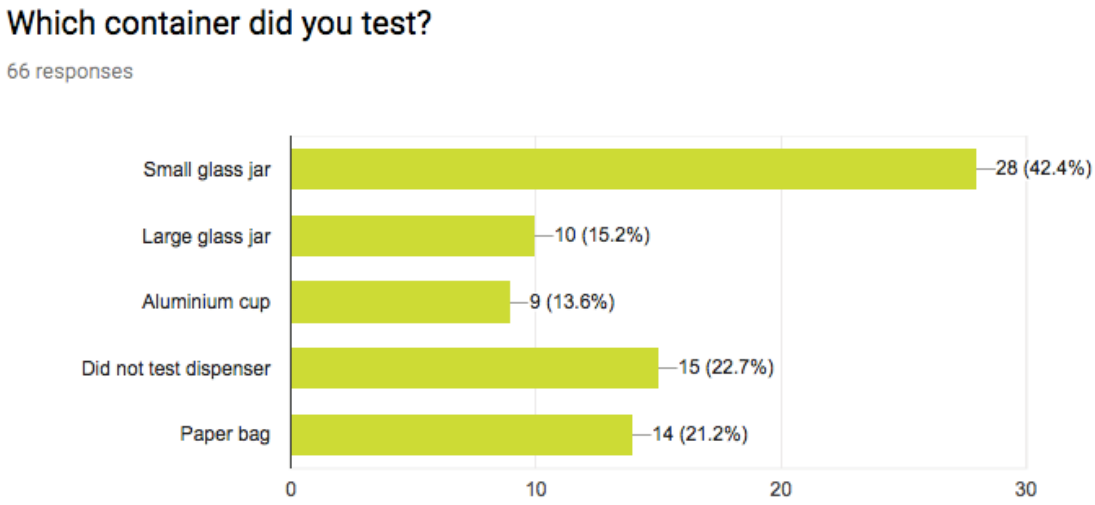


Figure 91. Containers tested

The most relevant survey information involved reactions to the brand. First, students were asked about their current shopping habits and how likely they were to buy things based on environmental impact. The majority of responses fell somewhere in the middle, but trended more towards the lower end of the spectrum, as seen in Figure 92. Not one person said that they always bought items based on their environmental impact.

Next, they were asked how environmentally friendly the brand appeared to them. A chart of the results can be seen in Figure 93. Nearly all of the respondents gave it a score of 4 or 5, corresponding to “very much” or close to “very much” in the survey. Only one student gave it a 2, and only one gave it a 3. Please refer to the survey images in the Validation section for the text labels that were provided to accompany the Likert scales throughout the survey.

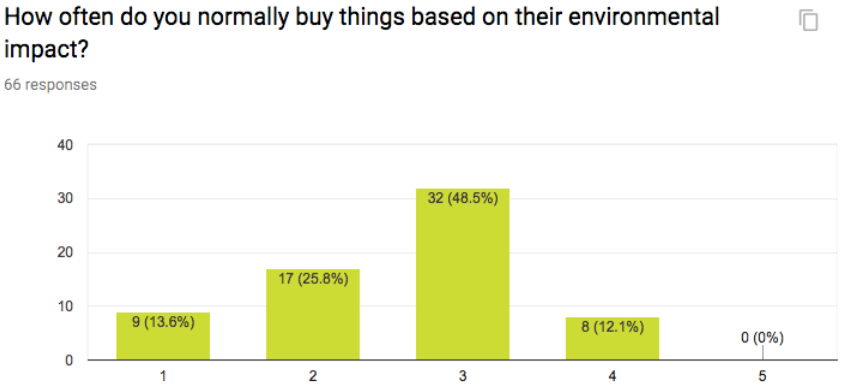


Figure 92. Purchase choices

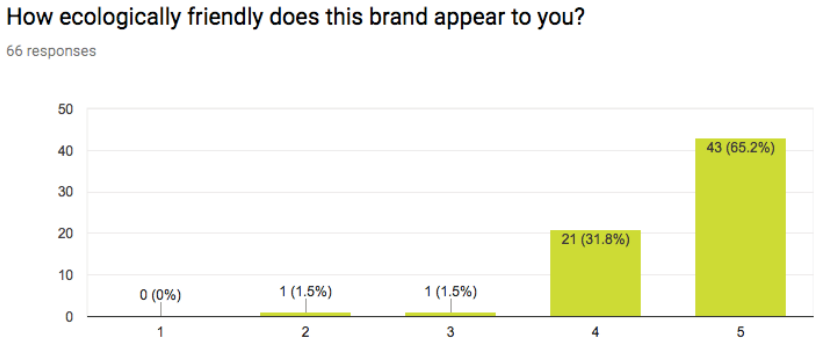


Figure 93. Brand's eco-friendliness

The next question provided some interesting open-ended qualitative responses. All of the answers can be seen in Figure 94. Because there was a lot of overlap in the responses, a bar chart was created in Microsoft Excel to aggregate the data and better analyze it (Figure 95). The majority of answers focused on green, nature, and the environment, which suggests that the brand's color palette was successful in conveying its intended message.

What do you relate the brand's colors with?

66 responses

nature (8)
Nature (5)
green (3)
environment (2)
Environmentally concerned
it's nice and are related with nature
related with nature
I relate to the nature and to friendly to enviroment
appropriate
it makes sense with the product
Enviroment and health
The green and the clean colors are relatable with the subject and it perfectly makes sense to me.
to green comunnity
Nature, fresh, neutral
nature, awareness, free
NATRUREZA
Health and environment friendly
Eco-friendly
Very eco friendly
eco friendly, green, healthy
nature, vegan
Earth, dense vegetables
nature, environment, health
green consumers, natural products

forest
eco, natural, friendly
Green - ecologic, good for the environment, ...
Being Green, Helping the enviroment
Green, Biological, Indie
Green spaces
nature, environment
nature, ecologic, environment, natural
Environment and ecology
nature and enviroment
Sustainability
environment and nature

Green world, nature, good health
ecology
nature, planet
ecologic, ecosystem, nature, life, Earth

Natural enviorment
Green initiatives, eco concerns
Nature, environment, ecologic, green, earth
Green
nature, sustainability and clean
nature, the environment
enviornment
Green/Yellow/Brown
Nature, free, soul
freedom and nature
Healthy planet
environment

Figure 94. Brand color relations

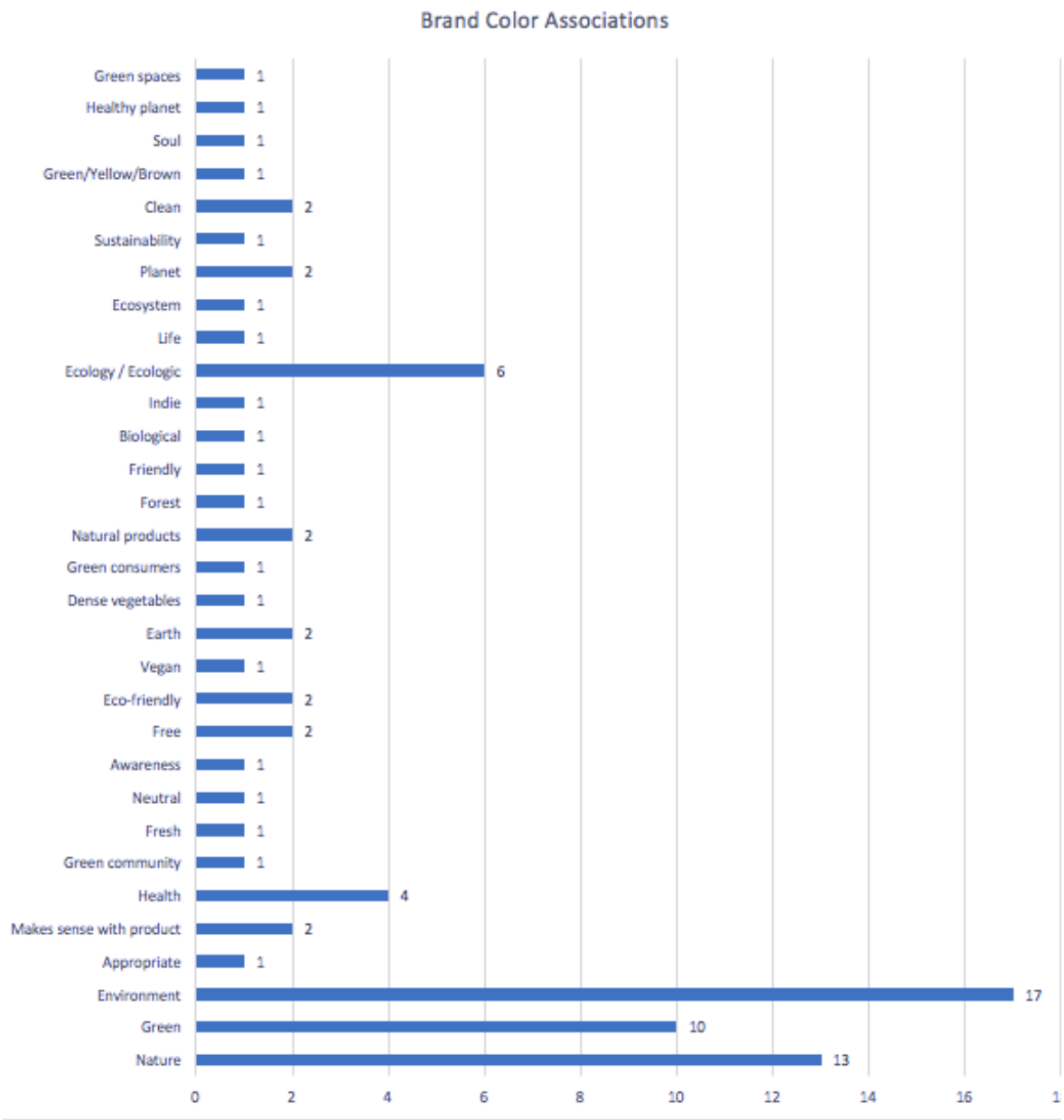


Figure 95. Brand color relations chart

Further data supported the use of this color palette over others. The next two questions asked respondents to choose between five different color variations, based on their personal preference and then how ecologically friendly the colors appeared. The following two pie charts, Figures 96-97 show the breakdown of responses. In both cases, the majority of participants chose the brand's color scheme over the other variations, even those including shades of green.

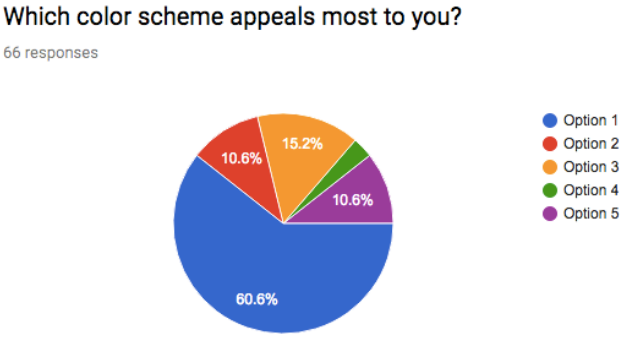


Figure 96. Color appeal chart

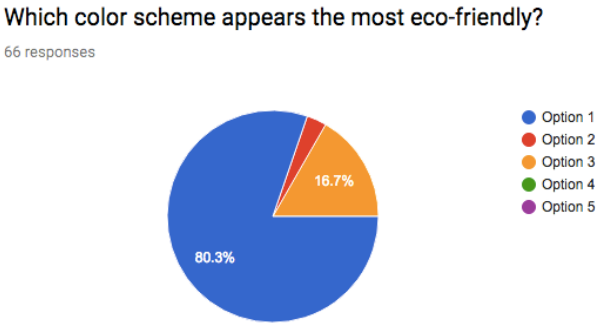


Figure 97. Eco-friendly color chart

Most participants were also fairly likely to buy food using the proposed system. 19 people gave a score of 5 or “very likely,” while 30 others gave the next closest score of 4. Only one person gave it a score of 1. A bar chart of the responses can be seen in Figure 98.

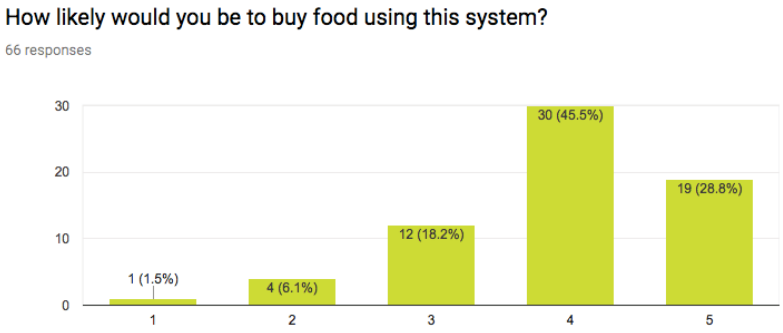


Figure 98. Likeliness to use system

People also thought that the brand visuals successfully reflected its mission. Almost all of the responses were 4 or 5, meaning "very well." Figure 99 shows this trend. Most students also found the messaging engaging, but fewer people gave it a full score of 5. This may be due in part to a lack of presentation skills or language knowledge. Still, as seen in Figure 100, the majority of responses were on the positive end of the Likert scale.

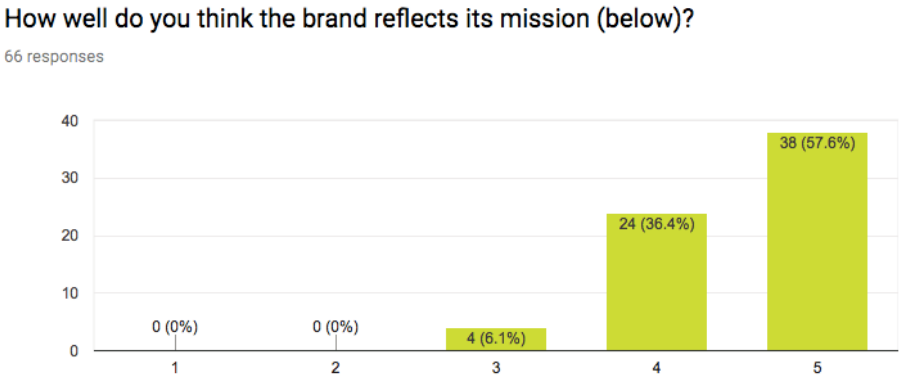


Figure 99. Brand mission responses

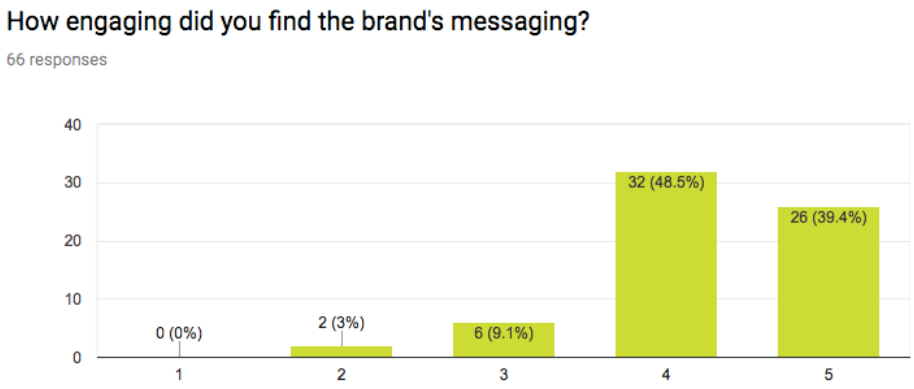
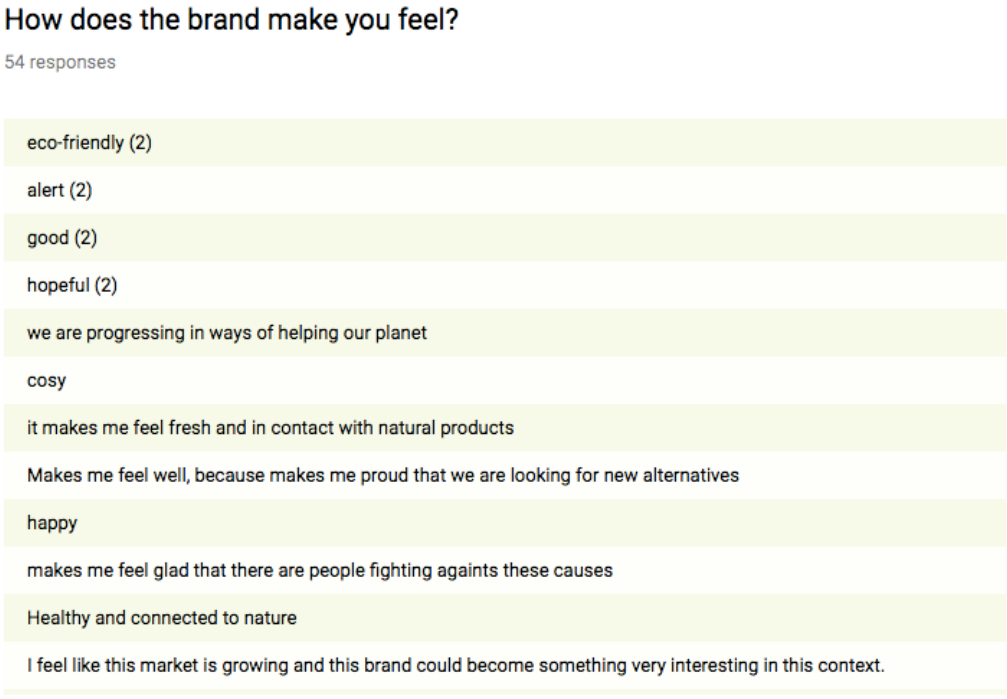


Figure 100. Engagement responses

A number of varying qualitative responses were collected in the next question, which was not required, but asked students to explain how the brand made them feel. Most people expressed positive, good, or happy emotions, but there was also a lot of worry and concern over the environment. However, this fear could be used in positive ways to inspire people to become more environmentally aware. Many felt hopeful for the future. Figure 101 contains all of the students' responses.



I'm doing something good
aware of the plastic problem that is present around the world
happy
it doesn't cause all that many emotions..
More eco-friendly and healthy
Eco-friendly
eco friendly. like im helping the environment
make me feel better person consuming like this
fresh
aware
Hopefull

I like the concept but at the same time the graphic elements has the feeling of a gas station for me somehow.
makes me feel awareness to the plastic problems
more awarness to the plastic envirnmental problem
well, good citizien
happy because someone cares about nature
thoughtful
Conscious
hopeful about the future
this brand made me realize that we really need change and if we can reduce all the plastic waste in simple things like this, even tho its a small step, if we all do it, we can make some big change some day! I loved the idea over the brand and the machine as well. Its a great project and idea!
Makes me feel thats systems like these are really necessary nowadays so we can reduce waste.
Hopefull
happy and motivated to help the world
Like you're actually doing something to help the planet
Worry about the planet and the harm that people are making everyday to our planet
Good
The need to be proactive about eco friendliness
hopefull, better person, eco friendly
safe but worried
social and environmentaly responsible
ecologicaly friendly
enviormentaly friendly
Eco-Friendly and Happy
It makes me feel bad because it warns about plastic waist, and happy because someone is thinking about this theme.

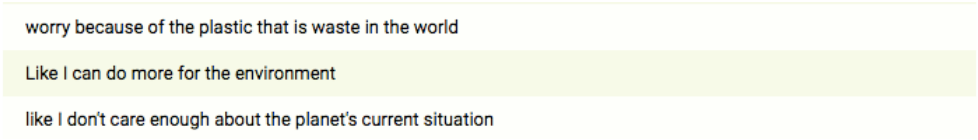


Figure 101. Brand feelings

Respondents understood the brand's concept very well, and most said that the Green Grain system could reduce the amount of plastic in the environment. In Figures 102 and 103, a breakdown of responses is shown in two bar charts. Nearly all of the students understood the brand concept very well. A total of 45 of them gave this question a 5 on the Likert scale, while 20 gave it a 4. Only one person put a 1 here, perhaps due to a language barrier.

Students were also generally optimistic about the impact that the brand could have on reducing actual plastic waste. Most people, 28 students, responded with a 4, while slightly less, 25, responded with a 5 of "definitely." Nobody gave this question a 1 or a 2, which would have corresponded to an answer of "not at all."

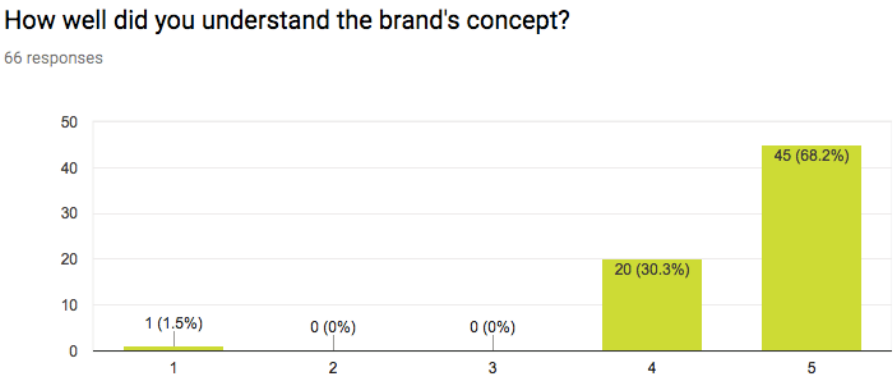


Figure 102. Brand concept responses

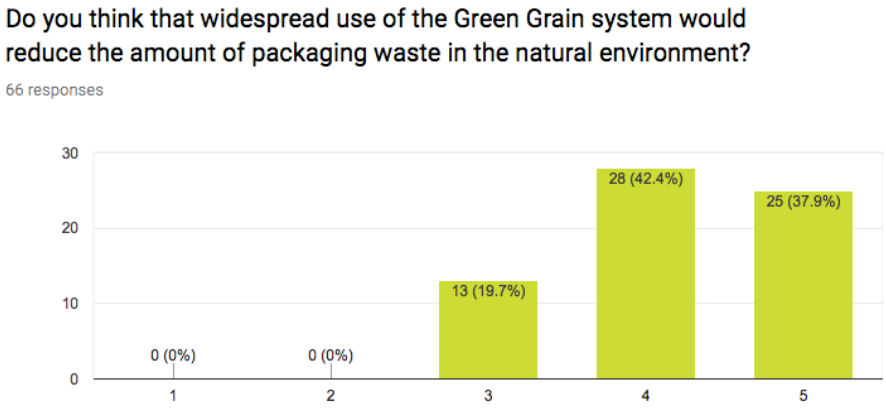


Figure 103. Plastic reduction responses

The infographic poster was fairly successful, especially considering that most of the participants only sometimes made purchase decisions based on environmental impact. In observation, most of the students were shocked to learn the information that it contained, especially regarding the amount of plastic particles in tap water. The Figure 104 shows the large number of respondents that did in fact feel compelled to waste less plastic after viewing the infographic. Only one participant gave it a 1 on the Likert scale, while 26 gave it a 5.

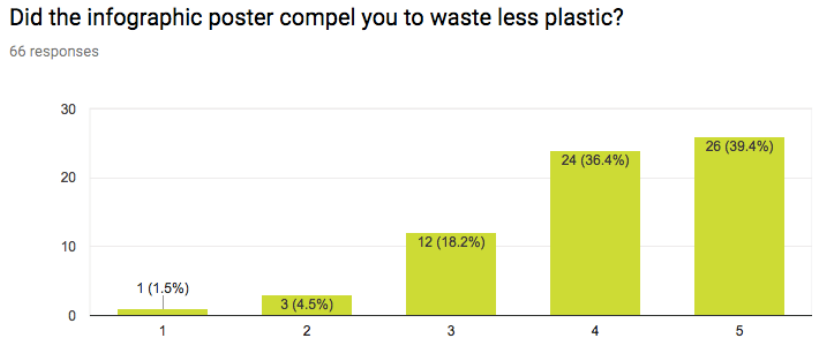


Figure 104. Infographic responses

The ease of use of the whole food buying system could likely have been improved with the help of a product designer and software engineer. However, responses still indicated that it was fairly easy. One student gave it a 2 on ease of use, while 27 scored it at 4 and 26 gave it a full 5. Figure 105 below contains the full breakdown of answers in a bar chart.

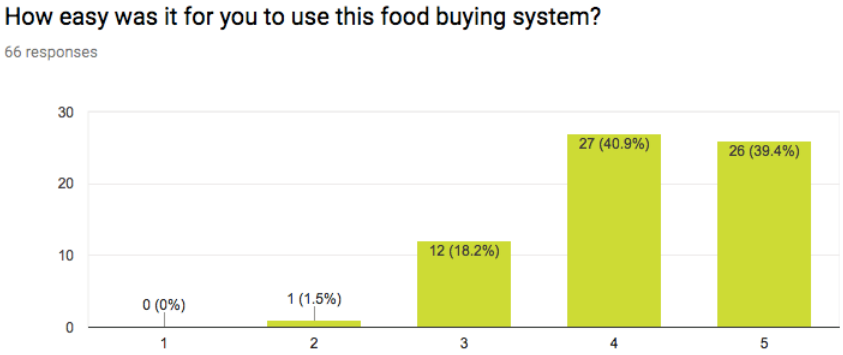


Figure 105. Ease of use responses

Lastly, the marketing and design students provided some helpful feedback and suggestions at the end of the survey. Although this question was not required, 26 unique responses were collected, as seen in Figure 106. The most useful answers suggested using a social media campaign as a marketing tool. A reward system telling customers how much plastic they've saved could also be an engaging tool. Since the system already proposed a discount reward system based on how much customers re-used their containers, this could likely easily be incorporated. Larger packaging would also be very useful, but due to limitations in creating the dispenser, it was not yet a possibility. Most simply said that they liked the service and didn't have anything more to add.

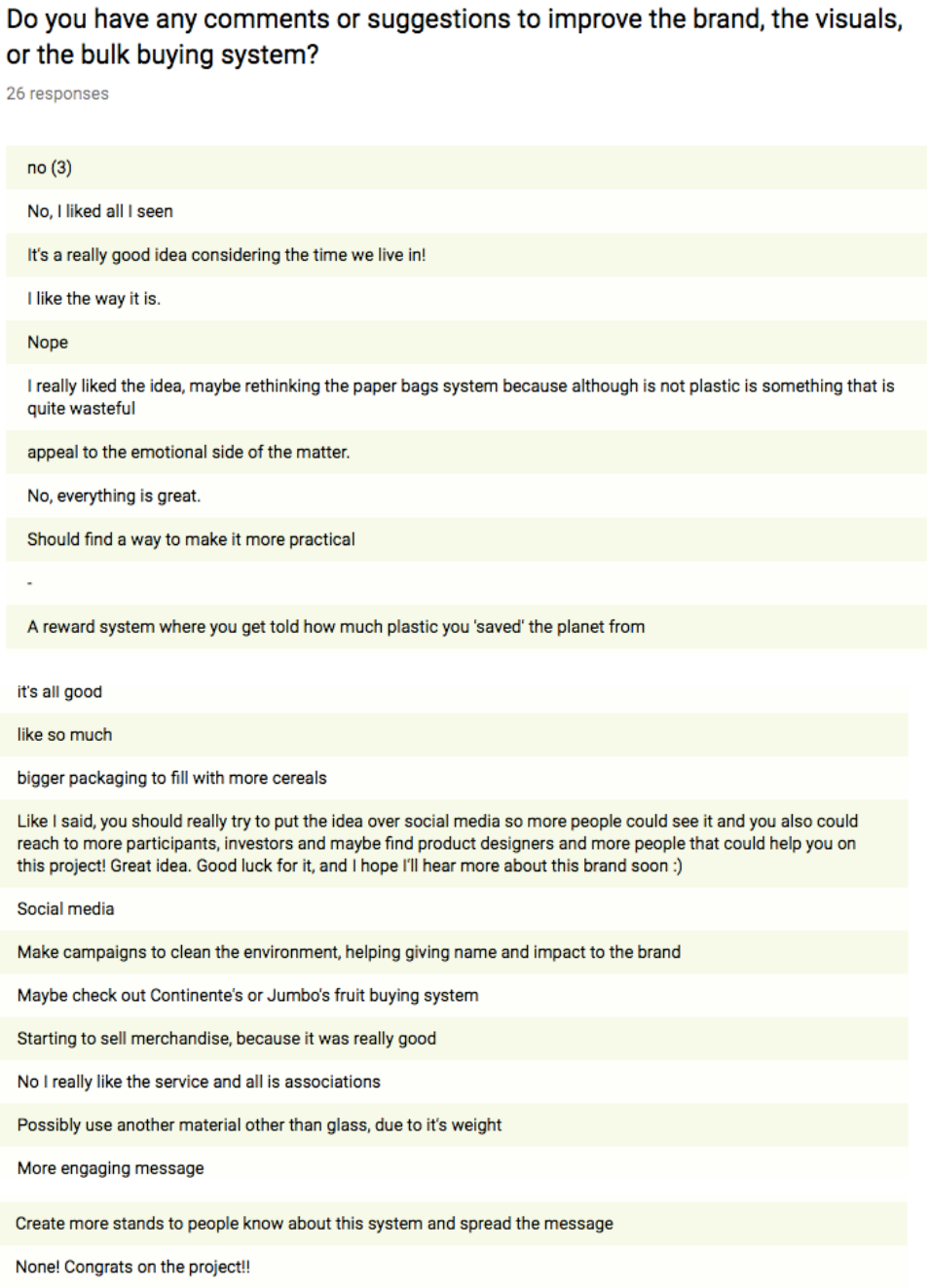


Figure 106. Survey comments

3.6 Summary

Overall, the validation process supported the decisions made in every stage of research, innovation, revision, development, and production of the project. A number of action research methods as well as findings from the Literature Review contributed to the success of the project. The design process began with broad thinking and brainstorming on the context of the problem and potential innovations. Next, the intentions were carefully

framed and research plans were put into place. Field observation offered a number of areas of improvement in bulk buying. Preliminary interviews with stakeholders allowed user input and insight to enter the design process from the start. Ideation began with sketches that were continually improved as new information was gathered. Participants were interviewed about their reactions to 3D models of the proposed system, and their feedback informed the next iteration of the project. Brand identity also developed from cyclical iterations of mind mapping, sketching, testing, evaluation, and revision. The brand name and logo were chosen based on poll feedback and individual suggestions. A competitor analysis and the creation of moodboards also contributed to the design of the brand's visual identity. Collaborative research allowed for a user-centered artifact. A number of brand touchpoints were designed and presented during validation. A total of 66 design and marketing students filled out a survey with their responses to the brand and the bulk-buying system. The results correlated well with the original goal of creating a brand of food packaging that is truly ecologically friendly and is perceived as such by consumers. Nearly all participants saw the brand as eco-friendly, understandable, and capable of making a difference in the environment.

4. CONCLUSION

4.1 Reflections, Contributions, and Limitations

4.1.1 Reflections and Contributions

The results of the validation survey confirmed the hypothesis and helped to answer a number of the initial research questions. This thesis tackled many inquiries: 'How can packaging be re-designed to be eco-friendly?,' 'How can packaging and branding design make actual eco-friendliness more apparent so that people can make better purchase decisions for the planet?,' 'How can designers deliver honest messaging about a brand's eco-friendliness?,' 'How can a package's design encourage recycling and/or re-use?,' and 'How can a food brand and its package design convey a clear message of its positive environmental impact?'

Based on the responses, nearly every participant found the brand to be ecologically friendly, and the majority also concluded that widespread use of the Green Grain system would reduce the amount of plastic waste in the natural environment (see Figure 103). The brand touchpoints conveyed a clear message of environmental impact, as can be seen in participants' understanding of the brand's concept (Figure 102). Respondents also thought that the brand reflected its mission well, as seen in Figure 99. Overall, the system was designed to encourage re-use of materials, and the majority of respondents said that they would be likely to use it (see Figure 98). The research, project implementation, and results validated the hypothesis that it is possible to create a brand of food packaging that is truly ecologically friendly and is perceived as such by consumers.

The survey results also aligned well with the findings mentioned in the Literature Review. Scott & Vigar-Ellis and Binninger both identified browns, greens, and creams as colors that most often convey environmental friendliness, and so they were included in the Green Grain logo. They also found that plain packages that contained little ink were seen as more eco-friendly (Scott & Vigar-Ellis, 2014, p. 646). Both glass containers tested in the Green Grain validation included very little ink coverage. The survey results indicated that the brand appeared very environmentally friendly to the majority of participants. The Green Grain color palette was chosen above others as the most eco-friendly, with about 80% of participants' votes. Nearly all of the responses about brand color association related to green, environment, and nature. Of all 66 participants, 97% said that the brand appeared completely or very ecologically friendly.

In the study by Binninger presented in the Literature Review, visual indicators such as natural imagery and the color green expressed environmental responsibility and positive

emotions among respondents. In the Green Grain validation survey, students were asked how the brand made them feel. Responses varied, but the majority of them were positive and hopeful, indicating a trend that aligned well with Binninger's findings (Binninger, 2015, p. 253).

The survey results relating to the infographic also correlated with the study of Kong, Harun, Sulong, and Jaratin (Harun, Sulong, & Jaratin, 2014, p. 929). They stated that purchase intention and credibility increased when a company's ecological claims were specific and relevant to daily life. In the infographic, the problems associated with plastic were laid out in exact numbers and tied to tap water and shellfish, both of which are consumed daily and directly affect humans. Most survey respondents stated that the infographic compelled them to waste less plastic, indicating that they believed it was relevant to their daily lives. The majority of participants also said that they were likely to use the system, which is similar to purchase intention.

4.1.2 Limitations

At the start of the academic year, my thesis project focused on designing ecologically sustainable food and beverage packaging that would help consumers waste less of both the contents and the packaging itself. I hoped to create highly functional, sustainable, and ethically designed packaging for a line of high-moisture food products (such as dips). I wanted to formulate a brand for this line of foods that appealed to the specific market segment of highly environmentally-conscious and gourmet consumers.

Because the breadth of my original thesis was too broad and unrelated to my expertise, I needed to revise it halfway through the first semester. My initial hypothesis relied on the use of spoilage sensitive inks and their effect on the eco-sustainability of a package and its contents. I was hoping to reduce food waste by eliminating "best before" dates. Sourcing spoilage-sensitive inks became a huge problem for me, since most vendors do not carry them, and especially on such a small scale. My alternative was to create these inks myself from chemicals in a lab setting, but I didn't have the experience or resources available to make this feasible. Simply put, spoilage sensitive inks such as CO2 or pH inks are not readily available to consumers; a graphic designer cannot buy them and use them for print.

Additionally, there are too many other factors that make up food spoilage for one of these indicators to really work. At the current stage of technological development, spoilage indicators would actually lead to more, rather than less food waste. After

attending the COST meeting of ActInPak (Active and Intelligent Packaging action group), I was able to talk to some key chemists who helped clarify the issue. Jose Martin Ramos-Diaz, PhD, a post-doctoral researcher, shed some light on just how under-developed these technologies currently are. “We agreed that judging food quality based on a single indicator is not accurate at all, and leads to huge amounts of food waste,” he wrote to me in an email (Ramos-Diaz, 2017).

Lastly, I was unable to test the full ecological sustainability of the package because a lifecycle assessment was not feasible without a final product in mass dissemination. Studies in environmental science were not related to the area of this thesis or my own expertise; therefore, the studies conducted were more in line with marketing and visual design. To move forward with my goal of reducing packaging waste, I revised my thesis. I re-wrote it to focus on conveying an honest message to the consumer about environmentally-friendly packaging through the use of visual design elements.

I faced some difficulty gathering participants for interviews and for the final validation survey. However, I asked my advisor if she would be willing to bring a class to participate in validation, and with her help I ended up speaking with over 100 students and gathering a total of 66 unique responses. The language barrier presented another problem. Since the validation survey was conducted in English in a Portuguese-speaking country, a question about fluency was included. Overall, this problem was generally combatted with the assistance of fellow colleagues who were willing to translate.

Perhaps the largest limitation that I faced involved the functionality of the bulk buying system. Ideally, I would have liked to collaborate with a product designer and software engineer. Due to limitations of time, budget, and networking, this was not possible. Therefore, regretfully, the dispenser included in the validation could only be a prototype. The fully functional model of the dispenser would have been made out of wood and glass, would have displayed the real-time food price as well as weight, and would have contained a barcode scanner and back-end system of tracking purchases. I also would have modified it further to include more vertical height and a spill-proof shield around the dispenser’s mouth. With greater resources and budget, I also would have preferred the glass containers to have been printed on directly rather than labeled. In short, the brand materials and system presented during validation were merely prototypes of the ideal items.

4.2 Conclusive Synthesis and Future Research

Further research could be made into turning Green Grain into a reality. A business plan would need to be formulated with the collaboration of business and marketing experts. Materials could be sourced from environmentally-sustainable suppliers. The actual products and packages in the system could be produced with enough financial backing and the expertise of a product designer and mechanical and software engineers. Additional research could be made into the creation of a bulk buying system for all types of food, not only for dry goods.

Other areas of research should also be addressed in order to transform this concept into a successful business. Usability tests could include a larger demographic of ages, occupations, and nationalities. Different models should be tested to further the ease-of-use; new model iterations would need to be developed with the help of an industrial or product designer. Cultural differences would also need to be assessed in order to implement this system across different countries and continents.

In conclusion, the Green Grain brand resonated well with respondents and presented a potential solution to the immense problem of food packaging waste in the environment. The results obtained suggest that the use of eco-friendly design and honest communication can be both understood and appreciated by many. The earth may be facing a global trash crisis, but with enough effort by designers and innovative thinkers, there is hope for a brighter future for our environment, ourselves, and future generations to come.

BIBLIOGRAPHY

Baik, M., & Suk, H. (2010). *Environmentally Friendly Packaging Appealing to Consumers' Emotions*. Paper presented at the Asian Conference on Design and Digital Engineering, Jeju, South Korea, August 27, 2010. http://ced.kaist.ac.kr/pdf/Baik_Suk.pdf

Binninger, A. (2015). Perception of Naturalness of Food Packaging and Its Role in Consumer Product Evaluation. *Journal of Food Products Marketing,23*(3), 251-266. doi:10.1080/10454446.2014.885868

Boylston, S. (2009). *Designing Sustainable Packaging*. London: Laurence King.

Cass, K., Flynn, P., Hong, A., & Rosseter, M. (2011). *Designing a Sustainable Packaging Program*. [Scholarly project]. In *MIT Management Sloan School*. Retrieved January 5, 2018, from http://mitsloan.mit.edu/actionlearning/media/documents/s-lab-projects/EMC-Packaging-report.pdf

Consultic. (2015). *Plastics – the Facts 2014/2015* [Brochure]. Author. Retrieved April, 2018, from https://www.plasticseurope.org/application/files/5515/1689/9220/2014plastics_the_facts_PubFeb2015.pdf

Design Can Change. (n.d.). Answers for Designers [Brochure]. Author.

Design Can Change: *Graphic designers unite to address climate change.* (n.d.). Retrieved January 05, 2018, from http://www.designcanchange.org/

Design Can Change. (n.d.). Sustainable Design Checklist [Brochure]. Author.

Design Can Change. (n.d.). Your Studio is Filled with Ways to Make a Difference [Brochure]. Author.

Dougherty, B. (2008). *Green Graphic Design.* New York: Allworth Press.

Eurostat. (2017, May). *Waste Statistics.* Retrieved April, 2018, from http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics

Food and Drink Federation (FDF). (2017*). Packaging for people, planet and profit - A sustainability checklist.* Retrieved January 05, 2018, from https://www.fdf.org.uk/packaging-checklist.aspx

Green, R. (2007). *What Can be Done to Promote the Use of Sustainable Graphic Design in Brisbane?* (Unpublished master's thesis). Brisbane, Australia.

IDEO. (2015). *The field guide to human-centered design: Design kit*. San Francisco: IDEO.

Kong, W., Harun, A., Sulong, R., Lily, J. (2014). *The Influence Of Consumers' Perception Of Green Products On Green Purchase Intention*. International Journal of Asian Social Science. Retrieved November 2, 2017, from http://www.aessweb.com/journals/50

Kumar, V. (2013). *101 design methods: A structured approach for driving innovation in your organization.* Hoboken, N.J: Wiley.

Lockheed Martin. *Sustainable Packaging Guidelines For Suppliers.* (2010). Retrieved January 5, 2018, from https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/suppliers/sustainability-packaging-guidelines.pdf

Lusher, A., Hollman, P., & Mendoza-Hill, J. (2017). *Microplastics in Fisheries and Aquaculture* (United Nations, Food and Agriculture Organization). Rome.

Magnier, L., Schoormans, J., & Mugge, R. (2016). Judging a product by its cover: Packaging sustainability and perceptions of quality in food products. *Food Quality and Preference, 53*, 132-142. doi:10.1016/j.foodqual.2016.06.006

Matthews, T. (2007). *Ten Ways Design Can Fight Climate Change.* Retrieved January 05, 2018, from https://thomasmatthews.com/project/ten-ways-design-can-fight-climate-change/

Mcdonough, W., & Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*. Farrar, Straus and Giroux.

Muratovski, G. (2016). *Research for Designers: A Guide to Methods and Practice.* London: SAGE Publications.

OSPAR. (n.d.). *Marine Litter.* Retrieved March, 2018, from https://www.ospar.org/work-areas/eiha/marine-litter

PAC, Packaging Consortium. (2012). *Sustainable Packaging Design Guide*. Retrieved January 5, 2018, from http://www.pac.ca/KC/PACNext/Presentation/Assets/3_Marina_Pietrosel.pdf

Ramos-Diaz, J. M. (2017, November 10). Info about sensory descriptors [E-mail to the author].

Scott, L., & Vigar-Ellis, D. (2014). *Consumer Understanding, Perceptions And Behaviours With Regard To Environmentally Friendly Packaging In A Developing Nation.* International Journal of Consumer Studies, 38(6), 642-649. doi:10.1111/ijcs.12136

Tang, S. (2014). *Sustainable Packaging Design: A Business Case Study* (Unpublished master's thesis). Royal Institute of Technology.

Tyree, C., & Morrison, D. (n.d.). *Plus Plastic.* Retrieved April, 2018, from https://orbmedia.org/stories/plus-plastic

United States, Environmental Protection Agency (EPA), Office of Resource Conservation and Recovery. (2016). *Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model.* Retrieved February, 2018, from https://www.epa.gov/sites/production/files/2016-03/documents/warm_v14_containers_packaging_non-durable_goods_materials.pdf

United States, Environmental Protection Agency (EPA), Solid Waste and Emergency Response. (2014). *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2012*. Washington, DC.

Wheeler, A. (2009). *Designing Brand Identity, 3rd Edition*. Hoboken, New Jersey: John Wiley & Sons. Inc.

White, P. (2009). *Okala: learning ecological design*. Place of publication not identified: Industrial Designers.

APPENDIX

Tables

Table 2. Research Timeline

Contextual Research Plan

Activities	Dates	Duration	Resources	Methods	Deliverables
Literature Review	Nov– Dec 2017	2 months	Books, articles, papers	Take notes and write	Lit Review
Trends Matrix	Feb 20	1 hour	101 Design Methods, Kumar	Design thinking	Trends Identified
Intent Statement	Feb 22	1 hour	101, Kumar	Design thinking	Defines problem and solution
Frame Your Design Challenge	Feb 25	1 day	IDEO	Design Thinking	Frames problem and goals
Contextual Research Plan, User Research Plan	Feb 27	2 hours	101, Kumar	Organizes methods of research	When different methods should be completed
Define Your Audience	March 1	1 hour	IDEO	Design Thinking	Who I will study
Field observation: Five Human Factors & POEMS	Week of March 4	1 -2 days, 1 hour per session	101, Kumar Notebook, camera, 2-4 locations	Field Observation	Notes and photos on human interaction
Preliminary Interviews	Week of Wednesday, March 7	1 -3 days, .5 hour per session	IDEO 101, Kumar Notebook, laptop with QuickTime to record	Semi-structured Interview, action research, collaborative design	Provides human centered design
System Sketches	March 14	2 hours	Pen, pencil, paper	Design thinking iteration	Sketch of prototype
3D Models	March 21-23	1-2 days	Laptop, Maya, Maya online tutorials	Design thinking iteration	Prototype refinement
Interviews on 3D Models	Week of March 30	1 -3 days, about 10 mins per session	IDEO 101, Kumar Notebook, laptop with QuickTime to record	Semi-structured Interview, action research, collaborative design	Feedback for refinement of prototype
Mind map	April 5	1 hour	Mindmup.com	Brainstorming	Concept generation, contextualization
Brand name poll	April 6	1 day	Google Forms, Facebook, LinkedIn	Online poll	Chosen brand name
Competitor Analysis	April 4-6	2 days	Designing Brand Identity, Wheeler	Competitor Analysis	Similarities and differences in competitor brand visuals and messaging
Color Palette	April 4	1 day	Designing Brand Identity, Wheeler, Adobe Color CC and Illustrator	Visual design iteration	Brand colors
Moodboards	April 3-4	2 days	Behance, Google Images, InDesign	Visual research	Visual trends and inspiration

Logo sketches	April 6-7	2 days	Pencil and paper, Designing Brand Identity, Wheeler	Visual research	Start of logo iterations
Digital logo concepts	Week of April 9th	1 week	Adobe Illustrator	Visual research, design thinking iteration	Refinement of logo concepts
Logo concept poll	April 16	1 day	Google Forms, Facebook, LinkedIn	Online poll	Feedback on logo preferences
Logo revisions	Week of April 16	3 days	Adobe Illustrator	Design thinking iteration	Final logo for inclusion on brand touchpoints
Infographic poster creation	March – April 2018	3 weeks	Professors and classmates' feedback, Adobe Illustrator, Euro Data	Environmental research, design thinking, visual research	Final infographic poster
Production of t-shirts, bags, labels, business cards, gift wrap, tags, posters	Week of April 23	2 weeks	Designing Brand Identity, Wheeler, IADE Fabrica, Arco Iris print shop	Production, folding, cutting, painting, printing	Final brand touchpoints
Validation	May 7 and 8, 2018	2 days	2 classes of design and marketing students	Presentation and survey	Survey results
Results Analysis	Week of May 14th	1 week	Google Forms and Microsoft Excel	Data analysis and chart design	Validation information

Table 3. Trends in Food Packaging Design

	Early 20th century	**Late 20th century**	**Currently**	**Emerging**
Tech	Mostly metal and glass, farm to family	Large factory production, industrialization of agriculture, Raw material extraction, plastics replacing glass	Bioplastics and 'compostable' materials (that usually cannot be processed unless in industrial contexts and cannot go into normal recycling streams)	Active and Intelligent Packaging, bio-based and home-compostable options that may not detract space from agricultural lands, internet purchase of groceries, bulk/no packaging
Business	Individual suppliers of staple foods, eg. Milkman, bakery, produce shop	Beginning of recycling as part of waste management system, big box stores take over small/local business in selling food staples	Toward greener energy sources in production, meeting desires of consumers for honesty in environmental messaging, trend towards Whole Foods	Perhaps new system in place for recycling these #9 materials such as compostable and bioplastics, Stores that sell in bulk only with reusable containers
People	Personal relationship with suppliers and local farmers garners trust	Lack of knowledge of environmental impact; Slowly learning how to recycle, cities picking it up	Want to trust brands commitments to the environment, skeptical, small apartments with less space for waste	Desire to create less waste / less harmful waste; want to know direct relation of how their purchase makes a difference

Culture	Small towns, family focus	Mass move to cities, fast food, convenience	Individuals, “reduce, reuse, recycle,” Green movement, local buying, increased eco-awareness, farm-to-table, slow food	Zero waste lifestyle, Back to nature, diaspora from cities, desire for convenient healthy food and brand honesty and responsibility

Glossary

Governments, companies, and individuals are becoming increasingly aware of and concerned with environmental issues. Each time a greenhouse gas such as oil is burned, harmful compounds such as CO2 are released into the atmosphere. The term *carbon neutrality* refers to the creation of new activities that offset harmful energy use. Individuals or companies who wish to become *carbon positive* take this effort even further by informing others and encouraging the change of habits. Each person's *ecological footprint* measures the theoretical area of the earth's land that would be needed to sustain the resource consumption of that individual. In the production of products for consumption, *embodied energy* refers to the sum of the energy needed to extract materials, process them, transport them and assemble them into goods, while *lifetime costing* includes all of this energy plus the amount it uses and wastes over the product's entire lifecycle. In this paper, *post-consumer waste (PCW)* can be defined as recycled materials left over from a product's packaging that have already been used by the end consumer (Matthews, 2007). Making use of PCW as a material can aid designers in becoming more environmentally friendly in their production processes and in the objects that they design. *Environmental sustainability* can be defined as a method of development that can indefinitely support human and all other forms of life present on our planet.

Terms Mentioned in Literature Review

Volatile organic compounds, or VOCs, are organic chemicals that have a high vapor pressure at room temperature. A package's *float* is its ability to keep the product at a distance from the sides of the container with as little movement as possible. *Unintentional product residue* refers to the remaining product stuck within a package. Foods such as junk foods that have short-term pleasure, but longer term negative effects can be referred to as *vice foods*, while healthier foods that may be less enjoyable in the moment, but provide long-term benefits can be called *virtue foods*.

Terms Mentioned in Project Methodologies

A *trends matrix* is a method of design thinking that utilizes a table of information to help define direction and identify areas for innovation. *Framing the design challenge* is a design thinking approach that helps to clarify goals and focus on impact. An *intent statement* is a statement that gives structure to the research process and provides support in transitioning towards further researching the context. A *user research plan* defines an

audience and timeline for research. A design thinking methodology developed by IDEO, called *Define Your Audience*, aids in the determination of the participants to study. The *Five Human Factors* is a field observation methodology that provides focus in the following areas: physical, cognitive, social, cultural, and emotional. *POEMS* is similar to the Five Human Factors, but instead looks through the lens of people (P), objects (O), environments (E), messages (M), and services (S). An *onliness statement* can be defined as a short sentence or paragraph used by a company to explain its purpose. A *brand brief schematic* outlines a company's mission and positioning. *Moodboards* are a form of visual research that include an arrangement of similar images for inspiration. *Mind mapping* is a visualization technique in which a main concept is explored through many branches of related ideas.

Interview Transcripts

Preliminary Interviews (Interviews 1-3)

Interview 01:

Arielle: [00:00:00] So, you work with food for a living?

Mafalda: [00:00:05] Yeah. I do like huge vegan recipes and then I do, I prefer photography. I have an Instagram. And, yeah, I work with food a lot.

Arielle: [00:00:15] So you cook mostly for yourself?

Mafalda: [00:00:19] Sometimes, it depends. If I'm recording or photographing, yeah.

Arielle: [00:00:23] And do you both cook most of your meals at home or do you go somewhere else like a kitchen or some friend's house?

Mafalda and Ana: [00:00:34] Yeah, I cook at home.

Ana: [00:00:34] All the time. I live with my parents, but just like we have completely different schedules. So, they work at day, so I have to cook my lunch and sometimes my dinner too.

Arielle: [00:00:45] Do you ever cook for them to just for yourself?

Ana: [00:00:48] I can cook like for my friends, for my boyfriends, not for my dad though.

Arielle: [00:00:56] So, do you buy groceries on your own?

Mafalda: [00:00:59] Yeah. I go with my mom usually.

Arielle: [00:01:05] And what kinds of foods do you usually buy? You said you make vegan meals mostly?

Mafalda: [00:01:10] Yeah, I try to go to the markets and try not to get anything in packages like I have to like cotton bags and I try to reduce as much as I can. But usually I go for more like vegetables and stuff.

Arielle: [00:01:25] So when you do buy food, how do you store it? Like how do you store your refrigerated goods and how do you store your dried goods?

Mafalda: [00:01:36] What's the dry goods?

Arielle: [00:01:42] Beans, if you have like not canned beans.

Mafalda: [00:01:47] I have like these jars. Yeah. I put it in the jars usually, unless they don't fit.

Mafalda: [00:01:53] Let me see think. Things with like already packaging, sometimes I left. Like I don't know like beverages and like cans and all that, they don't go to the fridge and then feijãos just like usually I just put the things in the fridge. It's like everything. I have like jars and stuff. I like to have everything organized, with little names for like the condiments, seasonings, yeah.

Mafalda: [00:02:36] Cause I usually buy them not like in plastic bags like from Mergao(?) and so on. I buy it, how do you say, like Maria Granel, like loose? Yeah, loose like bulk. Yeah. Like bulk I think.

Arielle: [00:02:52] Oh cool. So, when you buy your spices, where do you go to buy them? Like a market?

Mafalda: [00:03:01] Like jars or the seasoning?

Arielle: [00:03:02] The seasoning.

Mafalda: [00:03:05] I actually go to, it's not a supermarket, it's like the bigger ones. How do you say hypermercados?

Arielle: [00:03:14] Like a Continente?

Ana: [00:03:15] Yes. There's one, it's near my parents' house near like my car and they now, they're implementing this thing that is like trying to reduce the plastic. And so they have like already seasonings, cereals, dog and cat food. And you can just put it in a plastic bag or something to take with it. And like seasonings I really prefer because it's easier and I already have like all my jars with little labels on it.

Mafalda: [00:03:47] Sometimes it's cheaper if you're buying bulk.

Arielle: [00:03:49] Yes, that's interesting. That's a good fact too. What do you do I guess with other packaging after it's used like do you ever re-use it, recycle it, throw it out?

Mafalda: [00:04:06] I think it depends on the packaging. Like if it's like past the packaging like it's like that soft plastic, you can't really do... I try to recycle. But like if it's like a coffee jar or something I wash it and take like the label and use it for my spices or for more pasta.

Ana: [00:04:26] It's like more you know, it's like Mafalda said, some things like paper or like soft plastic I try to recycle because they don't last long but I feel like it's more like, it's not glass, but maybe coffee jars, like hard plastics or even sometimes not. Not usually because I have like plastic bottles already for it. But if I don't have them like sometimes the bottles, so I don't know what you can put water in it, put it in the fridge. Sometimes I do that.

Arielle: [00:05:06] So, you think you'd be more likely to reuse a package if it were in the materials of either glass or like a hard plastic?

Arielle: [00:05:15] Durable, yeah.

Mafalda: [00:05:17] It lasts. It also means that you don't have to buy any more packaging, like you save money and you reuse old packaging.

Ana: [00:05:25] It's no more money to jars.

Arielle: [00:05:28] Are there any specific brands that come to mind of some types of food you might buy, or does that depend?

Mafalda: [00:05:42] Right. Like eat all the time, right? Yes. Milk, like I think the brand is actually Soy.

Ana: [00:05:54] Oh for milk, I know Choice. I know Oakley, Alpro.

Mafalda: [00:06:02] Alpro, I'll buy Alpro or I think it's called soy or something.

Mafalda: [00:06:12] Yeah, I try. I usually go for the cheapest ones yeah.

Ana: [00:06:16] Depends on the money. And it's not in every supermarket, as I just don't like some, like I only drink soy milk and I can't like, I think it's Pingo Doce... I know there's a brand that is just terrible. But with everything, I'm usually for the cheapest brands.

Ana: [00:06:37] Uh, more brands...Well beer. Almost always Super Bock.

Arielle: [00:06:42] There's only really two choices.

Mafalda: [00:00:00] I mean I sometimes I like take pictures, so I might have something, like some brands I use.

Arielle: [00:00:06] Oh that's fine. It's just something that could be interesting. Or like, what inspires you to be loyal to those brands? Just the price? Or is there something about it like the quality that maybe you like?

Mafalda: [00:00:18] Sometimes I think it's the quality.

Mafalda: [00:00:19] I think if it's cheap, but it's also really good, I think it's like a plus plus.

Ana: [00:00:25] I usually go with like the cheapest price like for like for pasta or something like that like I'm not really picky. Sometimes there's like a big promotion like 'take two, pay one.' Like some things I'm really picky, like for example milk more or less, but it's not.. Oh, the butter, but not the butter you spread on the bread, the butter you use to cook.

Ana: [00:00:54] Margarine. Yeah, I always buy Vocairo(?) if I can't like buy another, I don't know why.

Mafalda: [00:01:02] Oh a brand that I really like, I think it's like it has granola and it has a bunch of stuff... it's Rude Health. It's really cool. They usually use like, how do you call the material of a box, like cardboard. They have the plastic plastic. But usually they're pretty good. They're a little bit expensive, but they come in like big packaging.

Arielle: [00:01:25] Oh cool. So, you feel like you can use a lot for one package?

Mafalda: [00:01:30] Sure. Like sometimes you feel like four euros for a granola, but it is like 500 grams of granola, so it can last for a long time unless you eat granola like every day for lunch, breakfast, and dinner.

Arielle: [00:01:44] Have you ever made something unusual out of like a package that you used? Like for instance, my dad sometimes makes instruments out of old coffee cans.

Ana: [00:01:57] My mom does that all the time really.

Ana: [00:01:59] Yes, like I use to store food. But she loves like painting and sometimes she sells it at like...Feira da Ladra, at flea markets. She really likes it, she has talent for that, I don't.

Arielle: [00:02:13] As containers or more like as art decoration?

Ana: [00:02:18] Like she does like both and sometimes she puts little candies inside. It's pretty cute,

Ana: [00:02:23] I think I've never actually done anything, but I mean I know I always have these ideas with some cans or with some bottles to, you know, do some lamps, but I've never actually done it. But they're stored there for it.

Mafalda: [00:02:41] When I was like in sixth, seventh grade I mean like it was kind of a lamp. But like I had a bunch of CDs I didn't use and I just glued them on the lamp. It was like a round lamp of paper and it was pretty cute.

Ana: [00:02:57] Sometimes I think, especially kids, we use like a lot to do, you know, art projects, but then we kind of lost it I think.

Arielle: [00:03:10] And then have some random questions that are more just like for idea generation and they can be crazy, any kind of response that you want. I'm just looking for reactions or opinions.

Arielle: [00:03:24] So what do you think that the grocery store of the future might look like, ideally, or just in general, ideally or not?

Ana: [00:03:35] I would love to see like, I think more people are more, you know, it's not like a general, like in generally, but some people are like being, they're being aware about the plastic and so on.

Ana: [00:03:54] So I think, you know, trying to reduce the plastic and the packaging. I think that will be my ideal supermarket. Yeah for sure. I don't know how that will work out, like big scale, for everyone.

Mafalda: [00:04:15] Maybe it doesn't make as much money, but maybe in the future it could.

Ana: [00:04:19] And it's somewhat expensive as well, even for people, like for the usual customer. For example, in the supermarket I told you about, I didn't find expensive, but if I go to some shops like Maria Granel, I find it super expensive.

Arielle: [00:04:34] Yeah, they have some pretty expensive stuff. Do you think that's because it's marketed at like a higher kind of and income bracket audience?

Ana: [00:04:45] Maybe. I don't know if it's because of that, or it's because it's not like a really well-known thing.

Mafalda: [00:04:53] It's because it's a trend now to eat like that and they kind of..

Arielle: [00:05:01] They have higher-end, like organic and local stuff.

Ana: [00:05:04] Yeah that's always like expensive stuff like organic. Sometimes you want to buy like good food and you just don't have the money. It's really expensive.

Arielle: [00:05:18] Yes, so that's an obstacle. So, what would be like the food packaging of the future or like your ideal package?

Mafalda: [00:05:30] I think something that could be dissolved in water, like it's not like for groceries and stuff. You know like the store Lush? Lush cosmetics? I really like it and when they send stuff in the mail they have that, for the stuff that doesn't move in the box, they have packaging peanuts and they're made of it - you can eat them - they're made of corn and if you want to throw them out you can throw them in a trash you can just put them in your bath and just, you just put water in it and they dissolve completely. So that's pretty cool.

Ana: [00:05:58] It doesn't like leave residues?

Mafalda: [00:06:01] No it doesn't. You can eat them, so it's like... I think it would be something good for packaging.

Arielle: [00:06:09] Yeah. I want to do a case study on Lush I think. They have like a parallel packaging system that works really well.

Mafalda: [00:06:15] You're really smart with packaging, I really like it.

Arielle: [00:06:18] I think that's about all the questions that I had that I needed to ask you. Thank you.

Interview 02

Jaina: [00:00:00] Our packaging is similar to the bags that you see in supermarkets.

Arielle: [00:00:04] Ok. So, like what kind of packages are they? Are they just like clear plastic bags?

Jaina: [00:00:16] There's a lot of like 18 wheelers where I work. So, we package into polybags that are like those thin plastic bags that you'll buy, well, potatoes in. And then we do onions in either a netting or vexar. Vexar is just like- Vexar looks like fishnet. It's like very thin.

Jaina: [00:00:40] And then we use knitted net which is like a lot thicker. Two different nets.

Arielle: [00:00:46] Why, just out of curiosity, to use one net for one thing and one net for a different thing?

Jaina: [00:00:53] It's all customer specification. So, like whatever the customer wants that's what you give them.

Jaina: [00:01:00] I guess mostly they think about how it looks.

Arielle: [00:01:03] So customers for you would be like grocery stores?

Jaina: [00:01:11] Yeah

Arielle: [00:01:11] Do you also stock for restaurants?

Jaina: [00:01:15] No because we're not - We're not selling bulk products. A different facility, like there's a couple sister companies and so like my aunts work at another company and they'll sell to restaurants because they'll sell bulk, like they'll just bring in boxes. Like they'll bring in a whole load of like yams in boxes and then a restaurant will come and buy like two boxes.

Jaina: [00:01:35] Ok. The restaurant doesn't want to pay extra for us to put them in like our brand bag because they're just going to cook them.

Arielle: [00:01:42] Right exactly. So, when you put them in a brand bag and then the next step would be putting it in some kind of secondary packaging probably before it goes into the truck to get transported, am I right?

Jaina: [00:01:55] Yes yes. It will either go into the bailer so like our potatoes will go into brown paper master bags. Um our onions will go into bigger like net bags,

and some customers, I don't know why, but they require them to be put back into boxes.

Arielle: [00:02:14] Oh ok. So, like cardboard boxes?

Jaina: [00:02:21] Yes yes.

Jaina: [00:02:22] Ok. And then you said you reuse the boxes? Do the customers give back the boxes to you?

Jaina: [00:02:29] We'll reuse the boxes that we received products in. So we'll get like a bunch of Idaho potatoes in boxes and then 50 pound boxes and will sell the boxes to repack and then we'll just like use those boxes to put products back into and ship back.

Arielle: [00:02:47] Do you ever have to dispose of packaging if it's faulty?

Arielle: [00:02:54] Do you ever have to dispose of packaging if it has like an error or fault in it?

Jaina: [00:03:01] Yeah usually we'll return the packaging back, but we'll get an exchange. That probably more falls on the on the manufacturer.

Jaina: [00:03:12] But there will be times where like we'll have a lot of leftover packaging from like a company that doesn't want to buy from us anymore or someone will update their label so then like we have a bunch their old label that we don't know what to do with.

Arielle: [00:03:26] What do you do with that? Do you ever do anything interesting with it?

Jaina: [00:03:31] I sometimes steal stuff and take it home and make weird sh*t out of it.

Arielle: [00:03:37] And does it just get recycled or thrown out?

Jaina: [00:03:42] I know that we can, like we'll call a company if we have a lot of polybags. We'll call a company and they'll recycle the polybags, but there doesn't seem to be anything that we can do about like the netting, the vexar.

Arielle: [00:03:56] Yeah.

Arielle: [00:03:57] And then. So, how's the produce transported to stores you use trucks?

Jaina: [00:04:04] Yeah, trailers.

Arielle: [00:04:06] And do you actually take part in like moving boxes of things around and putting them on the trucks?

Jaina: [00:04:14] I haven't been training in like palette jack using yet, but I will palletize, like I'll stack palettes sometimes. Yeah, yeah.

Arielle: [00:04:20] Do you find that you have any kind of logistical problems when packaging or stocking things for transport?

Jaina: [00:04:30] Logistical in like what sense?

Arielle: [00:04:32] Like if you think that there would be maybe a better system for the way that you put produce into like a package?

Jaina: [00:04:42] Like mechanically?

Arielle: [00:04:46] I'm not sure. Just have you ever had any kind of like issue come up where you were like 'Oh I wish that there was a better way that we did this' or 'I just wish there was a better way we kept inventory or stocked the produce.'

Jaina: [00:05:01] So we definitely have some inventory problems, like today we ran out of film that goes onto the onion bags for like one of the customers that we're packing for right now so like that was a problem, so like now we'll have to sit down and figure out a better way. Yeah inventory. Then there's just like- we'll make boxes. So, we're a two level facility - we're upstairs and downstairs, so we'll make a lot of boxes upstairs, but then like upstairs is a much smaller space. It'll get clogged up with all these like empty boxes while we're trying to fill them. And then the boxes will go on a conveyor and they'll go downstairs where they're palletized but there's way more room downstairs. So, we're like working on creating a conveyor system where we can take the fall back to bring them downstairs so they make boxes downstairs where they're palletizing.

Jaina: [00:05:51] I think that would make more sense space-wise. Yeah just like little things like that.

Arielle: [00:05:57] Yeah that's like one thing that can be a problem with packaging is that sometimes it just takes up a lot of space and people don't know where to put it. OK so I'm going to ask you some questions that are totally unrelated to work, just more like personal things. So, you buy groceries, right?

Arielle: [00:06:21] And you took most of your meals at home?

Jaina: [00:06:24] Yeah at least dinner, yeah.

Arielle: [00:06:28] So who do you cook for?

Jaina: [00:06:33] Mostly just myself.

Jaina: [00:06:34] Sometimes- I live at my parents, but I'll usually only cook for my little sister because I like her.

Arielle: [00:06:42] And then what kinds of foods do you usually buy or like to buy?

Jaina: [00:06:52] I eat a lot of onions, peppers. Beans are very much a go-to food for me. I like sandwiches, so I buy a lot of cold cuts. It's pretty simple.

Arielle: [00:07:08] Where do you store and how do you store these foods?

Jaina: [00:07:14] Pantry, fridge, cabinets.

Arielle: [00:07:17] So you have shelves in a cabinet that you put your dry goods on?

Jaina: [00:07:22] Yeah.

Arielle: [00:07:24] And are those like, do you buy them in a system - like do you have a kind of like a list that you go through when you need to buy new foods?

Jaina: [00:07:36] Not really. I kind of fly by the seat of my pants when I'm shopping, which definitely isn't the best system.

Arielle: [00:07:41] Oh no, it's not wrong or right, it's just the way it is. I definitely used to shop like that. But now that I'm living with someone I shop all the time like together; we make a list.

Jaina: [00:07:55] Yeah.

Arielle: [00:07:56] Are there any specific brands that you enjoy going to and buying?

Jaina: [00:08:05] I trust things, I definitely trust things at whole foods more than I trust things anywhere else.

Arielle: [00:08:12] Why would you say that you trust things at Whole Foods more?

Jaina: [00:08:18] Why would I say that?

Arielle: [00:08:20] Well, just what about Whole Foods makes you trust them more?

Jaina: [00:08:26] There's a couple things. There's one because I guess as a person with food allergies they're a lot more transparent and they definitely cater more towards me. So that was the original reason, but as I shop there more and more... There's two other things. One, their store has like nice lights and they have nice floors like compared to when you go into somewhere like Market Basket. You get Market Basket's trying to keep their overhead down, so they're catering to like a crowd that has a lot less money which is great.

Jaina: [00:08:56] It's kind of ugly. If it's not very clean then like it looks really gross. So, some of the Market Baskets aren't as clean and I don't like shopping somewhere that doesn't feel the clean. The other thing I know is that Whole Foods has like a very rigorous, too rigorous, food safety program which, I mean, safer food is better.

Arielle: [00:09:19] So have you ever bought in bulk Whole Foods or other places?

Jaina: [00:09:25] Like bulk items?

Arielle: [00:09:28] Yeah.

Jaina: [00:09:29] Yeah, definitely.

Arielle: [00:09:30] For you was there ever a concern about allergies when you were buying in bulk?

Jaina: [00:09:36] I don't have like... for me it's just gastrointestinal upset so I don't worry about cross-examination. Yeah.

Arielle: [00:09:49] Have you ever reused a package; like whether it's glass or plastic or otherwise?

Jaina: [00:09:59] Yeah.

Arielle: [00:09:59] What did you, or what do you currently use it for?

Jaina: [00:10:05] I can remember. I used to use, I would take the can or the jar that pasta sauce came in and then I would pasta back in the jar.

Arielle: [00:10:17] Oh whoa. OK. So, it was like a like a Tupperware situation.

Jaina: [00:10:23] I could bring that with me wherever I went. Then I had way too many pasta sauce jars and I had to get rid of some.

Arielle: [00:10:29] Yeah, yeah. But I like that idea. So, it was glass I take it?

Jaina: [00:10:35] Yeah.

Arielle: [00:10:36] OK. So how long do you think that you held onto them before you had to throw them out?

Jaina: [00:10:45] Oh for one, two years at least. I use them for a lot of things.

Arielle: [00:10:52] Then I have some other random questions that are kind of going to be out there but I'm just looking for reactions or opinions if you have them.

Arielle: [00:11:02] So what would your grocery store of the future look like?

Jaina: [00:11:09] That's an interesting question.

Jaina: [00:11:17] I think it would be organized differently. Okay. So if I'm not thinking about Whole Foods because Whole Foods I think is a pretty ideal shopping environment. If I'm thinking about other stores like there's this divide in stores where they take like healthy food and they put it in like this weird little healthy section and then they take all the like normal food and put it like in the rest of the store.

Jaina: [00:11:47] I think it's just silly because then I think it stops people, like people who aren't like shopping for healthy food. It stops them from going into that section. It's just like a stigma around like quote unquote healthy food for like uppity white people and things like that, but's it's just all food. It's hard to shop sometimes when you're going around and then you go to look for cereal and you're like just like the cereal I want to buy isn't here and it's like oh I guess Cheerio's are a health food now.

Arielle: [00:12:19] Yeah, it's totally different here in Portugal, but I know exactly what you're talking about.

Arielle: [00:12:25] And then as if there were no grocery stores or if they could be thought of differently, how do you think people would want to buy food in the future?

Jaina: [00:12:37] I think people like seeing where things come from. I think people would like more local stuff.

Arielle: [00:12:44] Yeah that's definitely like a trend I've noticed. Oh yeah. And what would your ideal package look like?

Jaina: [00:12:57] It would just be like the least amount of waste there could be, I think. It's better all around, it's better for the supplier, it's better for the environment.

Jaina: [00:13:09] It's better for everyone except the company selling packaging materials really.

Arielle: [00:13:16] That's something I'm coming across because what I'm actually trying to do is design like this whole zero-waste grocery system. And yeah that's something I'm coming across like who might be against it and who might be for it.

Jaina: [00:13:34] You're trying to design like a package-less grocery store is what you said, right?

Arielle: [00:13:37] Yeah, yeah, they exist. There's actually one here in Lisbon that I went to. But the problem with it is that it's like a little bit... Well one of many problems is it's marketed for like a higher kind of income bracket than most people can afford. And it's in like a part of town that you wouldn't expect most people to go to for groceries. And there's only one of them and I don't know if there even are any in Boston but it's becoming a new thing. But if it's out of everyone's price range it's not like feasible.

Jaina: [00:14:13] Anyway, yeah, it's also an interesting thing to think about from that perspective.

Jaina: [00:14:19] Yeah that's important because I'm almost like against bulk items because I also like, I do a lot of food safety work and I've recently got a company like certified in the highest level food safety certification you can get.

Jaina: [00:14:37] And it's insane like the amount of documentation and footwork that you have to do to acquire this thing. Like it costs so much money, it takes so much time. And then when you get our product to the store it goes up on like, the bulk products will just go up there. And then it's like little kids with their like snotty little hands touching and the grocery store accepts no responsibility for like any safety problems that arise there. Like if someone were to get sick it would go right back down the chain and it would come either to us or it would come to like the farm. Maybe it didn't even come from us, maybe it came from someone else, you know.

Jaina: [00:15:13] And it's interesting because someone brought that up at one of the conventions like one of the talks we went to recently for Whole Foods and they were like, well you know I'm very upset because you guys let anyone touch your produce and they were like, "No, no, we encourage our customers to wash their hands." But they don't.

Jaina: [00:15:33] Right. And there's got to be signs in supermarkets like this that you can see when you walk through the door, but it doesn't make it look like that's for the produce or anything, you know?

Arielle: [00:15:44] Yeah, I saw somebody the other day put her hand in a jar or like a big vat full of olives and just eat one.

Jaina: [00:15:54] That's disgusting!

Arielle: [00:15:58] Like everybody I guess has different ways of shopping. But I think that there should definitely be some kind of regulation about food safety for bulk items whether that's something that like people maybe can't touch the items inside or I don't know. There has to be some kind of a regulation for that and I would love any input I could get from you on that since you have some expertise on it.

Jaina: [00:16:21] Yeah, I do. I think that's the only way that something like that would really work for I mean like it's acceptable for produce but that's also because like produce is big. I'm not going to drop my like earring or my fingernail into produce. But if it's just like this barrel full of like oats or flour or beans or nuts or something small like that, like so many things could fall into that, people could sneeze. Yeah, I feel like this so much because when we're working in our facility it's kind of an arbitrary rule for us because like if earring falls out of someone's ear, it's not going to like ...maybe it's going to end up in a bag of potatoes, but most likely it's going to get like pumped out of the machines. We're not doing anything wrong.

Jaina: [00:17:02] So I don't know maybe in order to have like a full processing or a whole supermarket you have to look here. Employees might have to be trained in some type of.. there may have to be some like, like how Costco has cards like to get in? Maybe you have to do some type of like little online thing and like become part of like this quote unquote club. Then it's like now you can come in because you know that you gotta put gloves on or you gotta wash your hands.

Arielle: [00:17:35] Right, because even if the food is all in dispensers that only the employees can stock, you still would have to press a button or use a lever or something to get the dispensers to work and people could potentially touch the bottom of them or drop something into like, I don't know, the fall-out grate.

Jaina: [00:18:00] For foodborne illness outbreaks like all it takes is one really bad thing and then your name is ruined. Like remember what happened with Chipotle? No one's ever going to forget that. I will never eat at Chipotle. We were talking about that at work today. We were all like I don't think I'll ever be able to get eat there again.

Jaina: [00:18:24] They probably fixed their problems, but like now they're associated in my mind with just like getting sick. It's hard to shake that once you get that.

Arielle: [00:18:36] That's all I really have to ask. And thank you so much because you've given me some really helpful insights that I hadn't thought of otherwise. And I think it could be really cool to develop like a side program for people as a group to learn about food safety before they use these machines. Thank you. Yeah.

Jaina: [00:19:06] Thank you for including me. This is cool. I like to talk about this stuff, so it's no problem.

Arielle: [00:19:10] I'll keep you updated on like maybe how I'm going or like if I very much need your input again.

Jaina: [00:19:17] Oh yeah. If you have any questions, like I'm way too involved in food safety and you should be more than happy to talk about it with me.

Arielle: [00:19:28] Okay thank you. Have a good Thursday. It's like nighttime here but Thursday day.

Arielle: [00:19:41] Alright bye.

Jaina: [00:19:43] Bye. Good luck.

Jaina: [00:19:44] Thanks.

Interview 03

Arielle: [00:00:00] So you work at Whole Foods, obviously. Do you notice that customers use the bulk foods section a lot, or not?

Virginia: [00:00:13] Yeah, they do, they absolutely do.

Arielle: [00:00:14] Do you think that they use them more or less than the same prepackaged foods?

Arielle: [00:00:25] Like for instance you've got like, I don't know, a bag of peanuts and then you've got the peanuts in the bulk section. Is there any noticeable difference between the amount of people who buy the bagged one versus the one at the bulk foods?

Virginia: [00:00:43] It depends entirely on the customer. I think people are sort of convinced that the bulk is going to be fresher.

Arielle: [00:00:55] Yeah, really?

Virginia: [00:00:57] Yeah.

Arielle: [00:00:58] Why do you think that is?

Virginia: [00:01:02] I mean he fills it every day. First of all like he tops it off everyday and I think the fact that they can they can buy just as little as they want.

Virginia: [00:01:18] I do get people return... I do all the returns, like I know what people return. They will return the prepackaged ones way more than they return the bulk ones. I think it really depends. It's like I personally, I buy these stupid prepackaged walnuts for my parents. I honestly have to buy the same ones over and over and over and over and over and over again, and some people do that, but I mean I think there's a little more variety in bulk.

Virginia: [00:01:50] Yeah. So, I mean I guess, I guess the bulk is probably a little more popular.

Arielle: [00:01:58] Do you have any problems storing in bulk whether it's you or the guy who you work with who stocks it?

Virginia: [00:02:05] What do you mean?

Arielle: [00:02:06] Like do you ever notice that maybe things are spilling a lot? Or like customers don't understand something?

Virginia: [00:02:14] I was gonna say, no customers understand bulk. They... first of all, this is frustrating to me and I assume it's very frustrating to the customer as well. So at least in the Arlington Whole Foods that I worked at before and then this one, customers are not allowed to bring their own container for bulk, which blows. But what it is, is it's a public health thing. It's because we can't guarantee the cleanliness of the container.

Arielle: [00:02:48] Ok, so as a store you have to go by having like your own things where you can guarantee it even though potentially it's their own fault if they bring a dirty container in.

Virginia: [00:03:02] Also it's not about that customer getting sick. It's about that customer possibly getting other people sick because they use like the scoops. And if the scoop like falls in, say they're using like the container for nuts and then they clean it out and then they went and got rice or something like that and it like scraped the entire container and got like nuts on it.

Arielle: [00:03:27] Ok I see. But theoretically if there were no scoops and it was all just like the dispensers, that wouldn't be a problem, or would it?

Virginia: [00:03:41] I don't know honestly because we let people bring their own bags and they use their own produce bag, like those little mesh ones. So people use those and we have to put those on the scale, so that's the only other place, even the scale at the register, is the only place I can see cross contamination from someone's house as being an issue. And that's not an issue.

Arielle: [00:04:05] Interesting.

Virginia: [00:04:07] So I'm not really sure.

Arielle: [00:04:09] Do you think it's because of like Massachusetts law or federal law or just Whole Foods policy?

Virginia: [00:04:14] I was, in Arlington I was told it was a town law and then in Wellesley it was also a town law. Then there's also the thing that some stores are way more strict about it than others. These people often come and say, be like, you know like I did this at "blah blah blah," and I'm like, sorry you can't do it here.

Arielle: [00:04:38] Yeah. Do you offer-what kinds of containers do you offer for people to fill, then? Is it just bags?

Virginia: [00:04:50] We have... they're like the produce bags except they're not stretchy. Not that produce bags are super stretchy, but like, you know, they got a lot of give to them.

Arielle: [00:05:00] What material are they made out of?

Virginia: [00:05:10] You know, it's like the same like as what plastic bags are made out of.

Virginia: [00:05:14] Oh, like newspapers! You ever had a newspaper delivered? The bag the newspaper comes in.

Arielle: [00:05:23] OK a very thin plastic.

Virginia: [00:05:26] It's a little bit stretchy.

Arielle: [00:05:28] Yes, I do know what you mean.

[00:05:31] So officially in bulk we're not supposed to use those bags, we're supposed to use bags that are the exact same size but they're not green and they don't stretch. The reason for that is that the little green ones sometimes constantly... I'm looking for a bag, this will work, to show you. So, the Whole Foods bags, of course I have one. They have these little, you can see that it's got like ridges?

Arielle: [00:06:02] Yeah.

Virginia: [00:06:05] So, the um produce bags, if they only catch on that, they'll tear open, which, you know, is not too big a deal if it's like produce.

Virginia: [00:06:16] But if it's like a pound of f*cking quinoa it goes everywhere.

Arielle: [00:06:24] Okay, so that's definitely a problem.

Virginia: [00:06:28] So we talked about that, that's an issue that will happen. Or the conveyor belt, it will get like caught in the conveyor belt. So that's an issue and we use bags that are supposed to be the same bags except they like, they don't stretch, so they're like sturdier bags. The little tiny, the small size, paper bags, they call those six pound bags. OK. And then also the little takeout containers sort of with the plastic. Not the Chinese food, not like the Chinese food ones.

Arielle: [00:07:13] Like clear, like salad style? Yes, I know what you're talking about.

Virginia: [00:07:20] Like ones that's like that tall. Like it's like half a pint, pint.

Arielle: [00:07:25] Yes. Yes yes. OK.

Virginia: [00:07:29] Yeah those are really thin plastics and they aren't supposed to be like reheated or anything. But that's what we have in bulk.

Arielle: [00:07:37] And then how do you weigh these items when people bring them up?

Virginia: [00:07:42] So we have a code book. Customers are supposed to write it down on the package. Like what the number is or at least they need to know what they got. They can't even bother to manage that half the time. Yes, so then we just put it on our scale when they check out and we like punch in the code and it knows, you know, it knows the price and everything and weighs it. And then we have to manually adjust the tare for the package, you know, for the container they use.

Arielle: [00:08:19] And you have a list of what the containers that you have weigh? And so, you have to manually go into the system and like type in a number and do the math?

Virginia: [00:08:31] So the old registers we used to have to like before you ring them in, you'd be like "tare" "seven" "item number"... blah blah blah.

Virginia: [00:08:43] But now you can at least be like item blah blah blah, Weigh, Move on. All right, what's the tare for that? Only it sucks that people are like that was actually a tare 7 not a tare 5, and you're like, 'oh crap let me fix that.' So, you can adjust stuff later which just really good.

Arielle: [00:09:02] That's good. Do people ever like, do you ever have somebody being dishonest about what kind of food that is in their package?

Virginia: [00:09:14] We have most I know like Freshpond, has for example, way more options than we do. But the Arlington Whole Foods and the Whole Foods I work at now consistently only had four options for grind your own peanut butter. We have salted, wait so we have not salted, we have salted, organic, honey roasted, and then almond butter.

Virginia: [00:09:45] And I don't know how familiar you are with almond butter.

Arielle: [00:09:48] It's expensive.

Virginia: [00:09:50] Well, I was gonna say, doesn't look like peanut butter. Like it does, but it doesn't.

Arielle: [00:09:52] Yeah, it's a darker color.

Virginia: [00:09:56] Exactly, that's a darker color and then the honey roasted is also a completely different- like it looks different.

Virginia: [00:10:01] So I will straight up tell my cashiers and stuff, I personally can't tell the difference between the organic and the salt, or the non-salted and the organic. Like I can't tell. So those would totally be putting that they got the non-salted, and they got the organic which is more expensive, but I would not be able to tell. If they get them from the almond butter, which is 7.99 per pound, versus the other ones are like 2.99 a pound. People will do that. They'll put the almond butter, you know put almond butter in it and then use the cheapest code. Yeah. I'm ringing you up for almond butter, because you clearly got almond butter. you know for the most part we are expected to just take their word for it. People are definitely dishonest, like, a lot.

Arielle: [00:10:46] And do you ever, maybe you haven't personally, but when restocking the bulk bins, what material does the larger item come in? Is it a big bag? Is it like a crate?

Virginia: [00:11:04] Yes, it depends what it is. You know those, because you've probably seen these, potato bags. They're kind of like potato bags. The really big potato bags that are made out of like...it feels like it's like layers of kraft paper. Yes. It's like, they come, like a lot of it comes in like...the rice all comes in bags that are like that. Yeah like brown bags.

Arielle: [00:11:36] What does Whole Foods do with those bags after you use them?

Virginia: [00:11:43] Recycle them or if they're like compostable, we'll compost them or we'll just put them in our bailer to go with our cardboard.

Arielle: [00:11:52] Ok.

Virginia: [00:11:52] I personally don't know what exactly what they are and what we can do with them, but we dispose of them in whatever way.

Arielle: [00:12:05] Whole Foods has a composting bin?

Virginia: [00:12:11] Yeah, we have a compost available because that way customers can compost their food. I mean we sort of don't want people bringing sh*t from their own house, but we have a compost from the rest of our trash in the cafe, so they throw the rest of their lunch out, or napkins, like whenever can go in the compost. And then like every department is supposed to have compost like in their department and we have two huge like trash compactor dumpster things. And one of them is for trash than the other compost. And it smells horrible.

Arielle: [00:12:54] But does it work?

Virginia: [00:12:56] I mean it's.. we don't compost, like we compost, but the official composting doesn't happen at Whole Foods. Like we throw stuff into the dumpster and then some composting company comes and takes it.

Arielle: [00:13:16] So like a more commercial like large scale composting facility.

Arielle: [00:13:24] So I'm also going to ask you some questions that are just more general about like your own buying habits like what you like and what you do? It might be obvious because I already know you, and I know this, but, I'm still going to ask you. Do you cook your meals, do cook meals most of the time, at home?

Arielle: [00:13:52] I guess, you do cook some meals at home, or no?

Virginia: [00:13:57] *Virginia nods*

Arielle: [00:13:57] Is there anyone else you cook for?

Virginia: [00:14:02] Occasionally friends.

Arielle: [00:14:05] And where do you buy groceries?

Virginia: [00:14:07] Ninety percent from Whole Foods.

Arielle: [00:14:10] And why?

Virginia: [00:14:16] Girl, you know, it's the quality, the convenience, that discount.

Arielle: [00:14:23] How much of a discount do they give you?

Virginia: [00:14:26] 20 percent.

Arielle: [00:14:27] Then what kinds of foods do you typically like to buy?

Virginia: [00:14:39] I buy pretty much, I mean pretty much, the same sh*t every time. Because I make like the same things. But I buy a lot of produce. I buy meat. And I buy oh like a handful of specific dairy and cheese items that, like, I love.

Arielle: [00:15:03] Are there specific brands that you prefer, then? Are there specific brands of, like you said, cheese products that you prefer over other things?

Virginia: [00:15:21] Yes, we have- There are some local like Maple Brook Creamery, I think it's the name of it, in Vermont. And they do like phenomenal Mozzarella. I make lasagna and I like to use that or they like a ricotta too. The Saint Angel brie is really f*cking good.

Arielle: [00:15:46] So when you're like loyal to a brand, it's more just about, would you say the taste of it and the quality?

Virginia: [00:15:58] That, and then there's also like, I'm going to be real here, I'm shallow as hell. I like the idea of things. Like a lot. Once something has won me on the idea of it, then I'm like I like this.

Arielle: [00:16:16] Like what, what about the idea of you it? You mean like the brand seems like it has a message that you like?

Virginia: [00:16:26] It's on the one hand, if something seems popular. That's kind of important to me.

Virginia: [00:16:33] Packaging will draw me right in. The parmesan I like, it's Sartori Sarvecchio. It's just that their packaging, it just like the way that the product like looks. It's just like that's like a real parmesean, even though it's not. That's like the label.

Arielle: [00:17:06] Oh yeah, very traditional looking.

Virginia: [00:17:10] I'm like 'ooh, that's legit.' I do love it honestly more than um... That's what like a wedge of it looks like, with this little label on it. I like that more than I like stupid Parmigiano Reggiano, becuase I'm not that big of a fan of the Parmigiano Reggiano.

Arielle: [00:17:42] When you're done shopping and you have all of your foods, how do you store them in your house?

Virginia: [00:17:50] Mostly of it goes in the fridge. It goes in the basement because I buy a lot of sh*t in bulk.

Arielle: [00:18:02] How do you store the stuff that's like large bulk items in the basement?

Virginia: [00:18:08] We have... have you been in my basement recently?

Arielle: [00:18:12] No.

Virginia: [00:18:15] I feel like you must have been in there at some point.

Arielle: [00:18:18] Oh definitely yeah.

Virginia: [00:18:21] So my mom has put a bookcase in-between our water heater and the ancient fridge that came with the house that's in our basement. So she uses that bookcase for stuff. We also have things in just like bags on the ground around it. And then also on my grandfather's workbench which is like on the

other- it's like right opposite it. Just piles. But I use them because we buy, they go through applesauce a lot, so I'll buy a case of applesauce.

Arielle: [00:19:01] So you'll have an entire case like on the shelf?

Virginia: [00:19:04] Yeah and I buy cases of water. Sh*t that I know we're going to go through, like I'll buy in bulk. But the um stupid applesauce, you know those little glass jars? I put them in a milk crate, like a hefty crate. That's what we'll store.

Arielle: [00:19:26] Yeah. Do you have a system for stocking ingredients that you use? Sort of like if you run out of applesauce? Do you have kind of like an 'home inventory' or a shopping list?

Virginia: [00:19:40] I do and I don't. With the applesauce at least and stuff like that, I just wait for my mom to tell me like we need more. And then, also we have this dude Jerry who works in the grocery department and his job is special orders.

Arielle: [00:20:07] There's some terrible construction noise, sorry, I went into the bedroom to try to stop it. But it's not helping.

Virginia: [00:20:16] So he does does special orders and so what he does is, people can order like cases of things through him.

Virginia: [00:20:26] And so what he does is he takes down like the UPC of the item, like what size they want, how much they want, their name, and their number. And he like calls them when it comes in and sets it aside with their name on it.

Virginia: [00:20:39] And some people, they just you know, they order like one thing. Some people will be like, 'I want two cases of this. I want it every month.' Like there's some things he will order that will be a recurring order that you he knows to order for these people.

Arielle: [00:20:57] So there are certain Wholefoods customers who call in ahead of time and have things like put aside whenever their shipments come in?

Virginia: [00:21:06] So yes, they'll just talk, they'll talk to him and say like you know 'Jerry,' or I mean or they'll talk to us at customer services. We have like copies of the form to fill out. Yeah. But yes, so they'll basically be like 'I want to order a case of this' and then he'll call them and be like 'all right, it's in. Just stop by customer service and tell them your name and what you're going to pick up and someone will go get it for you.'

Arielle: [00:21:34] So what do you do with all the packaging after you use it?

Virginia: [00:21:43] I do my best to recycle when I can. And some packaging is compostable and I'll do that.

Arielle: [00:21:54] Is there a cashback system in Massachusetts, like for bottles and cans? Is there still one? I don't remember. Yeah. OK.

Virginia: [00:22:12] Redeemables are soda and beer, so carbonated beverages and beer, but not like wine or hard liquor or hard cider.

Arielle: [00:22:29] I wonder why.

Virginia: [00:22:30] Yeah, I don't know.

Arielle: [00:22:31] Interesting.

Virginia: [00:22:33] I didn't know that your home state didn't do that. When I went to Frendly Gathering and I was sorting all the redeemables and instead of saying like... on this it says like what states do it. And in New Hampshire it just said please drink responsibly.

Arielle: [00:22:50] Yep, that's New Hampshire. They're missing a law on that. And then have you ever re-used a package for a different purpose?

Virginia: [00:23:00] Yes, actually. So, I'm making a lot of my mom's bread right now. And one of her ingredients is wheat germ. And she usually uses the, I think the brand is like Kretschmer, but it comes in a glass jar.

Virginia: [00:23:21] And she went - we were like running low, so she went to buy more and then they just didn't have that one. So she had to buy like a different brand, but it came in like a cardboard box with like a bag that you have to snip open and... that's going to go bad. My mom goes through wheat germ very slowly. She keeps it in the fridge.

Virginia: [00:23:43] So she and I both agree without even discussing it, right? All right, well we'll just put it into the jar.

Arielle: [00:23:53] Right. So it was kind of like the glass container was a way to keep it better for longer. And then how long do you think, I mean I guess do you have other cases of this happening or no?

Virginia: [00:24:07] For a while I was using... if something, like if something comes in like a jar, I'll try and re-use it. Like always I use a lot of mason jars and you know they come with a stupid two-step lid?

Arielle: [00:24:33] Yes, some of them do.

Virginia: [00:24:35] Yeah, I hate those.

Arielle: [00:24:36] You know why that is?

Virginia: [00:24:38] Because that's what you would want for like official, for like actually canning. Because when you can, that's what I learned...When you can, you can reuse the like ring part, but you can't use the flat top again.

Arielle: [00:24:53] Because it goes back onto the.. it goes directly on the...

Virginia: [00:24:57] Whatever allows it to have a vacuum seal is like destroyed after one use basically. So like those, the flat tops, and like mason and canning jar lids and are single-use, so you have to buy new flat tops every time. So there's the Green Mountain Gringo salsa comes in these little mason jars with a normal f*ckin lid, so every time I got that I would like save the lids and like swap them with my mason jars.

Arielle: [00:25:30] Yes. So, what did to use them for and how long did you hold on to them, or do you still have them?

Virginia: [00:25:36] I still have them. Like when I buy Bob's Red Mill stuff, that sh*t immediately gets decanted into like a mason jar because I'm not trying to deal with that stupid bag.

Arielle: [00:25:53] Yeah. I guess the only questions I have left for you are kind of weird ones that are super out there, but I'm looking for reactions from people, just whatever your opinion on it would be. What would your grocery store of the future look like?

Arielle: [00:26:28] You don't have to answer all of these if they're like weird or confusing.

Virginia: [00:26:35] I have an answer. Because it bothers me so much that people can't bring their own containers in, I would love if there was like a system in place where if you came in and you were going to do some like bulk shopping or whatever, you could put your reusable container into like an automated like washing machine or something when you first come in to like sanitize it and then weigh it and just slap a sticker or it'll print a sticker out for you of the weight of the thing and it'll come out sanitized. Just like so if you don't see that dated sticker or something we can still deny it, but the dated sticker is like proof that you weighed it and sanitized it here today.

Arielle: [00:27:27] That's a great idea.

Virginia: [00:27:30] Because that's the number one issue, you know, our stupid containers are not the most reusable. And then that we can't- you know just people aren't allowed to bring the re-usables in, it's just not very green.

Arielle: [00:27:49] And then how do you think people will want to buy food in the future?

Virginia: [00:27:59] Well, unfortunately I think InstaCart and things like Amazon Fresh or like Amazon Prime now, sh*t like that is all taking over. But I don't think, I don't think it's gonna take over completely because literally every day people come in and return stuff from InstaCart orders because like this person picked this and this stuff is terrible.

Virginia: [00:28:30] I think the thing is that on the one hand, people hate going to the grocery store. On the other hand, a lot of people love it because it's their opportunity to socialize with their neighbors. They'll be able to select their products like themselves. Some people are so disgustingly picky about their things. But then also like I just watch constantly like 'Oh Sally, oh my god, how are you?' They'll be talking like four registers apart and just start gabbing away, like people have the best time. I think, you know, people on one hand want things to be more futuristic with regard to like InstaCart and Amazon Fresh, but then people are also always going to want to have that control.

Virginia: [00:29:25] ...To be able to go and select the best date, you know, the best 'best buy' date that they can find and the best produce that they think is the best.

Arielle: [00:29:39] I guess that's it!

Feedback Interviews (Interviews 4-6)

Interview 04

Arielle: [00:00:00] Well my first question to you is: do you - Where do you currently most often buy your groceries?

Christian: [00:00:08] It's a mixture of three: Minipreco, Pingo Doce, and Lidl.

Arielle: [00:00:24] And do you buy anything at these stores loose in bulk?

Christian: [00:00:38] Oh gosh, I think buy most of my items pre-packaged.

Arielle: [00:00:42] Does this system that I just showed you make sense to you? Is there anything that you have questions about, that might be confusing, or that I need to clarify?

Christian: [00:01:06] The one thing I would explain more about, but I think it's just because of my lack of knowledge about the kind of I.T. systems behind these products, is how the barcode reader would be able to read the code as well as finding out all of the information in regards to where it gets sent and how it would recognize the dimensions of them.

Arielle: [00:01:33] Yeah. Yeah, I think because the bar code would be specific to the container. Like certain sites ones. Every single container would have its own bar. And so maybe that information would be specific to like oh it would recognize that it's the larger container rather than the smaller one because of the code. And then that would connect to the weight system. Yeah, I actually don't think I can code any of this myself.

Arielle: [00:02:04] How likely would you be to buy your groceries, your dry groceries, using this system?

Christian: [00:02:21] I think it would be hard for me to use it because I do kind of like the simple, not really into technology too much, like in terms of self-service checkouts. I really even like to go to those. I will generally go to a person. So, with this being another kind of tech thing... I wouldn't feel comfortable using it because it's new.

Arielle: [00:02:49] Ok. So is there any - do you you have any suggestions about how you could improve it or things that you might be more attracted to using it?

Christian: [00:03:19] I mean it's just the model, is this how it would look?

Arielle: [00:03:24] It's really just like a prototype.

Christian: [00:03:32] Because it looks kind of a little bit industrial, maybe if it was a little, in terms of colors...

Arielle: [00:03:40] Some more like tactile feeling?

Christian: [00:03:45] Yeah.

Arielle: [00:03:46] My intention was actually to make this wood grain. But I don't know, I can't really understand the program since I just taught it to myself.

Arielle: [00:03:56] And then these would be in glass and metal.

Christian: [00:04:01] So you'd see straight through to see what-

Arielle: [00:04:03] Yeah, so this is asking you to kind of theoretically picture something that it's not looking like yet. Would that maybe be a little bit more like human and less industrial feeling?

Christian: [00:04:17] Yeah. Also, I think if it could be possible, maybe instead of - so these would be metal as well?

Arielle: [00:04:25] Yeah. Just glass and metal. And then my final question is: do you think it would present a problem to have reusable containers that are glass that people would have to carry to and from the store?

Christian: [00:04:52] I think, yeah.

Arielle: [00:04:52] Like when you buy groceries do you like plan on going there or is it more of something that happens when you're coming back from something?

Christian: [00:05:01] No, I do generally anticipate that I'm going to go grocery shop. I think glass is a little bit fragile for doing the grocery shopping. For my grocery shopping, I know I won't be filling bags to capacity and like possibly maybe get the Métro somewhere. So if it was like recycled plastic maybe that - I would feel more comfortable with that being in my grocery bag than glass.

Arielle: [00:05:36] I see. Cool. And maybe it could also offer another material option like recycled paper bags in case you forget your container or just don't want to carry it.

Christian: [00:05:54] Yeah.

Christian: [00:05:56] Well, I think also in terms of transportation maybe another material for the actual container might be easier to carry.

Arielle: [00:06:05] Lighter, more durable.

Arielle: [00:06:07] Okay cool. That's all I really have to ask you.

Interview 05

Arielle: [00:00:01] Ok so my questions for you are... Where do you currently most often buy your groceries?

Pedro: [00:00:09] In the supermarket.

Arielle: [00:00:12] Which supermarket?

Pedro: [00:00:15] Mostly Pingo Doce.

Arielle: [00:00:17] Do you buy anything loose in bulk?

Pedro: [00:00:21] Would you mean?

Arielle: [00:00:22] Like granel. Do you buy anything at Pingo Doce or elsewhere that's like loose from a dispenser? Such as nuts..

Pedro: [00:00:31] I'm thinking...no. Does fruit count? No.

Arielle: [00:00:35] Well, in a different sense, yeah.

Arielle: [00:00:41] And then, does this system that I just showed you, this proposal makes sense to you? Or do you have any questions about it?

Pedro: [00:00:50] It does make sense, but yeah, I have some questions.

Arielle: [00:00:53] Sure, what are those?

Pedro: [00:01:05] The barcodes. I mean, what's, my question is what's the benefit of the barcode? I mean what's the benefit of the machine knowing, you know, what jar it is, or who it's for. Is that for an industrial purpose, that kind of thing?

Arielle: [00:01:27] The benefit of it would be for the shop to know what you're buying and how much of it you're buying, so that when you go to checkout they only have to check one thing and they don't have to like go through inventory and find out and just trust you to be honest about what you're saying.

Arielle: [00:01:44] Also it could be a good way for customers - repeat customers to get discounts instead of using like a card or a piece of plastic.

Pedro: [00:01:55] Yeah, it makes sense, yeah.

Arielle: [00:01:57] And then how likely would you be to buy your groceries such as rice and cereal using a system like this?

Pedro: [00:02:09] I think I would be willing, yeah, sure.

Arielle: [00:02:13] Is there anything specific that you would like, that you do like, about this model?

Pedro: [00:02:29] Yeah, I like the design overall. I think it's, I think it's a good design. I mean I like the way it fits perfectly and I like the immediate conversion of kilos to money.

Arielle: [00:02:51] Right. That's the idea. You can see what you're buying, before you have to pay for it.

Pedro: [00:02:57] Although, although, there is - I think that actually I saw that kind of thing on supermarkets, you have like the scale and you put it.

Arielle: [00:03:10] Where have you seen that? I'm just curious.

Pedro: [00:03:14] Some Pingo Doce or some Continente.

Arielle: [00:03:17] But do the scales just have the weight, or do they also put the price of the item?

Pedro: [00:03:22] That's a good question and to be honest I think Pingo Doce doesn't have that kind of system anymore because it's the most common thing. I don't remember when the last time I saw that, but there were since... I've been in some supermarkets. I can't remember when or where. While that at the same time, they had like a scale that you can use and you yourself take the, you know, because it would weigh it. Yeah, then it would dispense like a sticker. Then you put it on your bag and you go to the machine, to the paying area.

Arielle: [00:04:00] Yes, so that would keep track of what you buy.

Pedro: [00:04:03] Yeah, I think so. The price of it. But I don't, I don't see that thing anymore.

Arielle: [00:04:10] It's weird I wonder why. Would you have any suggestions for improving this system?

Pedro: [00:04:25] So I was thinking when I saw it because it's so compact and sh*t, I thought, I thought it would have some kind of vacuum, automatic vacuum, you know, thing. You know what I mean.

Arielle: [00:04:44] To keep the food from coming out or...Like what part of it would have a vacuum?

Pedro: [00:04:47] It would automatically close it, like whatever you're buying.

Arielle: [00:04:53] Oh I see, so it would automatically dispense and then stop dispensing?

Pedro: [00:04:58] Yeah, and then close it up too. Yeah, I have no idea if this...

Arielle: [00:05:04] It's an interesting idea. And then do you think that it would present a problem to have to carry these glass containers to and from the store?

Pedro: [00:05:18] That's a good question.

Arielle: [00:05:22] I think it probably would. So I'm looking into like alternatives, but -

Pedro: [00:05:26] Because of being glass it would be a problem.

Arielle: [00:05:28] Yeah, it's good and durable and you can wash it, but it might be a lot for some people to have to carry glass containers to store themselves.

Pedro: [00:05:38] Can it be a plastic thing?

Arielle: [00:05:41] It could.

Arielle: [00:05:42] I'm trying to do like two options, so that maybe you forget them or you don't want to do it, there's like a paper version too that's just like recycled paper or something.

Pedro: [00:05:54] That's a good one because that way people wouldn't even have to carry it, they'd just take it off the store. Some kind of paper that could fold.

Arielle: [00:06:00] Yeah. You know, like a foldable cardstock or something.

Arielle: [00:06:05] Yeah. That's all I really had to ask you I think. Thank you!

Interview 06

Arielle: [00:00:03] Now that you've seen what I'm working on, or the prototype for it, my questions for you two are: Where do you currently most often buy groceries? What kinds of stores?

Catarina: [00:00:25] Markets. That's where I buy it. I bring it from home.

Arielle: [00:00:35] Bring what from home?

Catarina: [00:00:38] I bring like fresh vegetables or fruits or dried fruits. I bring it from the countryside.

Arielle: [00:00:49] Oh, that's great.

Catarina: [00:00:53] Because I have that possibility with my family and the other stuff that buy in supermarkets.

Arielle: [00:00:58] Do you buy anything at the supermarket loose in bulk currently? In bulk, like granel?

Joanna: [00:01:11] Not really.

Arielle: [00:01:11] Does the system that I just showed you make sense to you, or did you have any questions about it?

Joanna: [00:01:18] It's very convenient.

Catarina: [00:01:28] I agree. My only question was if you would have to spend quite some time and money in changing or building the other dispenser. I was worried about that.

Arielle: [00:01:46] Me personally, yes. I would have to spend money in building it. In order to validate it, I have to build a physical one and I'm going to do tests actually in the bottom floor of IADE when it's all finished and I have the brand and logo on everything and an apron and the poster.

Catarina: [00:02:05] Is there something similar in the market?

Arielle: [00:02:07] Not quite. Everything, the problem is that everything in the market is actually made out of plastic. Even the high-end ones that are like 300 or 400 dollars are made out of acrylic for the dispenser itself. And that might be to prevent breakage and you can get them with metal frames or really just a metal frame. I haven't seen any with wood frames even, but the metal frames themselves cost for some reason like 200, 300 euros.

Catarina: [00:02:37] Which is the material you are planning to use?

Arielle: [00:02:41] Right now I have plastic and I'm either trying to make it look nice enough using like metallic finishes so nobody who's testing it knows that it's not metal or go to a woodworking shop and see how much it would cost for them to make like a custom stand for it.

Catarina: [00:03:00] Plastic, because you need it to be transparent.

Arielle: [00:03:02] Yes, plastic or glass because they needed to be transparent. But I can't use glass because nobody makes them.

Joanna: [00:03:10] Are you planning on using this service here in Europe, or back in the US?

Arielle: [00:03:15] It's theoretical, so I'm not actually going to build it. But it would be great if it worked for both the US and for Europe.

Joanna: [00:03:28] Because I've seen businesses like this online already. They do like package-free stores.

Arielle: [00:03:34] Yes, yes there's one in New York. I know there's one here even. So how likely do you think you would be to buy your groceries using this system?

Catarina: [00:03:51] As I said before, I think I would use it, I would buy using this system if I had planned my shopping. Otherwise it would be a bit heavy.

Arielle: [00:04:11] So is there anything you specifically like or dislike about it? Would you just say the heaviness would be an issue?

Catarina: [00:04:17] If the container would be nice, it would be interesting to keep it and to use it for other purposes.

Joanna: [00:04:36] Is it really necessary to use the container you provide, that you sell, or can you bring your own containers that fit in the dispenser?

Arielle: [00:04:53] The reason I'm trying to do it with like a standardized one that you'd have to buy is so that it would be recognized by the system with this barcode that would keep track of what you're buying and how much it is. You can't lie about it when you're paying. And also it could link you to your purchase history a little bit, so that the company could give discounts or promotions to like loyalty customers. That theoretically could also work for your own containers but then you'd have to know exactly how much it weighs beforehand or do a tare on it, which is like finding out the net weight of your food.

Arielle: [00:05:35] And then, that's pretty much it. That's all I had to ask.

otos

THE PROBLEM WITH PLASTIC

We are standing at the brink of global collapse. As we sit in our office chairs, ride the metro, cook dinner, and turn on our TVs, we are blissfully caught up in our personal lives. Individuals may ignore it; media outlets and politicians and businesses and whole governments may ignore it, but the terrifying truth is that we are all sitting on a ticking time bomb. As we go about our daily lives, how many of us stop and think about how all of this – our way of life, our friends and families – could all come crashing down? The simple fact is that the earth cannot sustain its current population.

The problems of packaging waste, pollution, and global warming threaten our way of life, our environment, and all species that call earth home. The planet is more overpopulated than ever, and the current population uses 50% more resources than the environment can even provide. Not only do we harvest more resources than the earth can produce, but also, as a species, we destroy and change existing lands, leaving them even less productive for the future. In producing and consuming "stuff," a large amount of pollution accumulates on our planet – from smog, to greenhouse gases, to the Great Pacific Garbage Patch. The problem with this accumulation is that it constantly grows, leaching toxic chemicals in the process and killing wildlife, thus disrupting the entire global food chain. Eventually, this results in human diseases such as cancer and respiratory problems, as well as natural crises like climate change and shortages of food and clean water.

This infographic follows the path of plastics, all the way from production to end of life. Plastic production has grown almost exponentially since the 1950s, and compared to other materials, it contributes the most to CO2 emissions in extraction and manufacturing. Single-use plastics are used for only minutes within our lifetimes and then discarded. In the European Union, the recycling rate of plastic remains low compared to other packaging materials. Recycling is the most optimistic end of life waste stream for plastics. In the EU, many countries still landfill a large percentage of their plastic waste. Even so, plastic waste is better managed in the EU than many other parts of the world. China is the biggest contributor to plastic in the ocean. All of this mismanaged plastic leads to microparticles in our oceans and lakes, and subsequently, in the tap water that we drink. These plastic particles also make their way into sea life, including the shellfish that we eat. Different amounts of plastic can be found in our drinking water and shellfish throughout the globe. Choosing re-usable containers can help stop this cycle of harmful pollution!

GREENGRAIN

Our Promise:

The main purpose of Green Grain is to reduce harmf
waste by providing reusable containers in a trash-free b
This system uses technology to improve the bulk buying
purchases, providing customers with real-time prices,
lost to spillage.

Green Grain is the only bulk food store that has an easy
eco-conscious consumers in Europe and the US who wa
waste during an increasing global trash crisis.

CO_2 emissions in production?

lastic production (PET)
aper production (corrugated containers)
lass production

portation
nergy

Process
Non-Energy

Net Emissions

Growth in Plastic Production

Plastic production

Production in million tonnes

0
50
100
150
200
250
300
350

1950 1953 1956 1959 1962 1965 1968 1971 1974 1977 1980 1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013

*Trend lines are second degree polynomials

Which types of packaging materials are recycled most?

European Union (27 countries), Eurostat Estimate

Glass
Metal
Paper and cardboard
Plastic
Wood

100%
80%
60%
40%
20%
0%

2007 2008 2009 2010 2011 2012 2013 2014 2015

Where else does our trash end up?

European Union (28 countries), kg per capita

Incineration including

Compo

2007 2008 2009 2010 2011 2012 2013

How much plastic waste is landfilled in Europe?

More than 50% of plastic waste is landfilled
Between 10 and 50% of plastic waste is landfilled
Less than 10% of plastic waste is landfilled
* 2014 data


organic corn, organic cane sugar,
organic barley malt extract, sea salt


Organic Corn Flakes
GREENGRAIN
GREENGRAIN


organic corn, organic cane sugar,
organic barley malt extract, sea salt