I, Minkyu Song, hereby submit this original work as part of the requirements for the degree of Master of Design in Design.

It is entitled:
Personalized Shopping Experience for Social Impact

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This work and its defense approved by:

Committee chair: Gerald Michaud, M.A.
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Personalized Shopping Experience for Social Impact

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By

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Abstract

Most products aimed at solving social problems were successful in terms of providing a solution to a social issue. However raising awareness of social problems, and involving people in continued support to help solve social problems is another challenge for designers.

In this study, the principles of design for social impact will be suggested with specific examples of social charities that were successful in garnering support from the public. Current programs related to hunger issues in the US were analyzed to figure out new design opportunity areas. The principles of design for social impact applied to an object and its service to encourage continued support as part of everyone’s daily life by reminding them of hunger problems.

Keywords: design for social impact, donation service, personalized shopping experience, product design
Acknowledgments

I would like to acknowledge all the people who helped and guided me along this long journey. First of all, I would like to thank Gerald Michaud for his time that he has spent with me to establish a fundamental direction of this project. I would also like to thank Heekyoung Jung for providing general guidance and feedback, but especially for her guidance on the interface design evaluation. Every conversation and discussion that we had was meaningful. Finally, I would like to thank Ramsey Ford, because through his class, I was reminded to design for social impact. Moreover, the references he suggested to me for this thesis had a significant role in inspiring me to come up with a new donation model.
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Chapter 1: Introduction

1.1 Social Problem

A social problem is social phenomena that emerge in society or groups of people in the world as
a form of negative residue that emerges from the everyday pursuit of dominant values and
interests. It is a threat to values and interests dominant in society at a given time. A social
problem is also a condition created by society that is feasibly alleviated or solved by society
(Adam Jamrozik et.al, 1998).

1.2 Design for social impact

Designers can apply the social impact of their projects in addressing social problems —poverty,
sustainability, equality, and health and wellness—to make a better society by design.

To designers, social impact is about the impact of products or services on individuals and groups
of people, and on our society, economy and environment. On every design project, designers can
consider balancing the needs of the individual with the needs of the overall community. (IDEO,
2008). This is because social problems can be mitigated through the process of design, which is
an intellectual approach that emphasizes empathy, adductive reasoning, and rapid prototyping
(Jon Kolko, 2012).

In order for designers to better define areas where they can contribute to solving social problems
by their design project, Design 21 Social Design Network partnered with UNESCO to adopt
UNESCO’s social themes, and encourages designers to think about how their projects will deal
with the following social themes.
Designers have worked on projects that aim to solve social problems such as education and water issues. For example, One Laptop per Child (OLPC) aims to provide each child with a laptop to develop the passion for learning and the ability to learn how to learn. The other example is the Hippo Water Roller Project that was designed for Africa and other developing nations where women and children are struggling to transport water from points that are often located far from their homes. It has been proven that using the hippo water roller is a more easy and efficient way to collect and carry water than traditional methods.

### 1.3 Limitations of the projects

The projects that I mentioned above have been successful in terms of providing a solution to the social problem by design. However, when it comes to raising awareness for the social problems, and encouraging people to be involved in continued support, it will be debatable to say that those projects are successful. The main reason is the price that is required to participate in supporting the projects. Another issue is the donation period. Most organizations have their donation events during a very specific period of time such as the holiday season. As a result, there are no ways in

| EDUCATION | Literacy, Educational resources, Education for all |
| AID | Emergency relief, Medical and Humanitarian aid |
| POVERTY | Extreme poverty, Urban poverty, Homeless |
| COMMUNITY | Gender & race equality, Community development & welfare, Sports |
| ENVIRONMENT | Habitats, Sustainable development, Biodiversity, Water, Climate change, Natural disaster reduction |
| COMMUNICATION | Freedom of expression, Access and understanding of media and the internet, Media development |
| ARTS & CULTURE | Protection of cultural diversity, Art as empowerment |
| PEACE | Human rights, Genocide, Conflict resolution |
| WELL-BEING | Health, Disease, Disability |

Table 1. Social Theme (Design 21 Social Design Network)
which people keep participating in their effort to solve the social problem. Therefore, an object of this study is building a way in which people can continuously support to solve social problems in their daily life, and can encourage other people to be involved in the efforts by raising awareness of social issues.
Chapter 2: Case Study of Social Donation Events

This case study examines social donation events, the specific aspects that contribute to their success, and how this can be applied in designing projects that will have a social impact. Three successful social donation events were researched: UNICEF Tap Project, ALS Ice Bucket Challenge, and Turn Your Miles (RED). Each event has had a significant role in increasing awareness about social issues that need to be solved, as well as garnering support from the public. This information was used to develop a new donation model for solving hunger issue in chapter 3.

2.1 A: UNICEF Tap Project

In 2014, UNICEF Tap Project designed a new campaign to help people around the world without access to clean water by encouraging people to stop touching their phones as long as they could after visiting uniceftapproject.org on their phones. The project’s sponsors donated the monetary equivalent of one day of water for every 10 minutes users went without touching their phones. As a result, $1.6 million was raised from over 2.6 million users who did not touch their phone for totally over 250 million minutes.

![UNICEF Tap Project Process](image)

Figure 1. UNICEF Tap Project Process
In 2015, the project goal was to provide 14 million days of clean water for children around the world, and the project’s sponsors and donors fund one day of clean water for every 15 minutes instead of 10 minutes in 2014 that participants do not touch their phones.

2.2 B: ALS Ice Bucket Challenge

The ALS Ice Bucket Challenge is an activity that nominated participants to have a bucket of ice water thrown over their head. They have 24-hours to complete the mission from the time they are nominated and if they do not complete the challenge, they have to donate $100 to charity. If they complete the challenge then they only have to donate $10.

It aims to raise awareness of the disease amyotrophic lateral sclerosis (ALS) and encourage donations for the ALS association. It spread on social media during July to August 2014 in the US and other countries.

On August 29, 2014, the ALS Association announced that donations related to the ALS Ice Bucket Challenge have topped $100 million in the past month. That’s a 3,500% increase from the $2.8 million that the ALS Association raised during the same time period last year. More than three million people have donated.
2.3 C: Turn Your Miles (RED)

Turn Your Miles (RED) program is part of the One Step Closer, which is a partnership between the Bank of America and (RED) that is a tax-exempt nonprofit organization in the United States, and aimed to raise funds from corporate to end Acquired Immune Deficiency Syndrome (AIDS). The Bank of America, (RED) and Nike made a challenge in which for every pledged mile recorded with Nike+ Running, the Bank of America would donate $.40 up to the weekly goals and up to a total possible donation of $1 million to the US Global Fund to help end AIDS, Tuberculosis, and Malaria, and to support and fund prevention and treatment of HIV/ AIDS.
Figure 4. Turn Your Miles (RED) partners and weekly goals

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Social Donation Event</th>
<th>Social Design Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Title</strong></td>
<td><strong>Social Donation Event</strong></td>
<td><strong>Social Design Project</strong></td>
</tr>
<tr>
<td><strong>When</strong></td>
<td><strong>March, 2014 (World Water Month)</strong></td>
<td><strong>2007 Holiday Season</strong></td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td><strong>UNICEF ALS association</strong></td>
<td><strong>One Laptop Per Child</strong></td>
</tr>
<tr>
<td><strong>Social problem</strong></td>
<td><strong>Water Crisis</strong></td>
<td><strong>Hippo Water Roller Project</strong></td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td><strong>Giving clean water and adequate sanitation to children in need.</strong></td>
<td><strong>Provide each child with a laptop.</strong></td>
</tr>
<tr>
<td><strong>Donation</strong></td>
<td><strong>Every 10 minutes you don’t touch your phone, equivalents of a day of clean water.</strong></td>
<td><strong>Give communities improved access to water.</strong></td>
</tr>
<tr>
<td><strong>How it works</strong></td>
<td><strong>1. Visit uniceftapproject.org on your phone.</strong></td>
<td><strong>Give one, Get one Program, Purchase product on the website.</strong></td>
</tr>
<tr>
<td><strong>Donation Partners</strong></td>
<td><strong>Giorgio Armani</strong></td>
<td><strong>Bank of America</strong></td>
</tr>
<tr>
<td><strong>Touch point</strong></td>
<td><strong>Smart Phone, Website, Social media</strong></td>
<td><strong>Website</strong></td>
</tr>
</tbody>
</table>

Table 2. The Comparison of Social Donation Events and Product Projects
2.4 Three Design Considerations for Social Donations

<table>
<thead>
<tr>
<th>Empathy</th>
<th>UNICEF Tap Project</th>
<th>ALS Ice Bucket Challenge</th>
<th>The turn your mile (RED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Water crisis</td>
<td>- ALS</td>
<td>- AIDS</td>
</tr>
<tr>
<td></td>
<td>- 10 minutes = One day of clean water</td>
<td></td>
<td>- One mile = $.40 = One day of medicine</td>
</tr>
<tr>
<td>Motivation</td>
<td>Challenge, Remind your time, Show your record, Compare you and others.</td>
<td>Being nominated from friends, Watching &amp; making fun video,</td>
<td>Set weekly goal, Show achievement</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Putting down your phone</td>
<td>Watching video on social media and donate.</td>
<td>Running with Nike+ app</td>
</tr>
</tbody>
</table>

Table 3. Three aspects in successful social events

2.4.1 Empathy

Empathy is a foundation aspect of social donation service to make it succeed.

In this study, empathy is defined as understanding exposed problems, and the value of their donation and its effect. Empathy has a significant role in raising awareness of social problems. Traditionally, donation events were exposed to the general public through TV show, newspaper, posters in public places such as bus stations and bulletin boards where people could face the problems without any attention. However, recently social media and digital devices are exploited as the way to spread the social phenomenon in the world. A number of its users can be easily exposed to the social issue through social media such as You Tube, Facebook and Instagram. These were used to deliver the message about Amyotrophic Lateral Sclerosis (ALS) through peer to peer in summer 2014. Even the social media companies use their infrastructure to alleviate negative impact of social issue. Facebook, for example, sent their users news feed donation to fight against Ebola. The Turn Your Mile (RED) was designed for people who are using Nike running app on their smart phone. Therefore, Nike running app users were able to be aware of the AIDS problem whenever they access the app.
Another fact of empathy is giving the information about the value of participants’ donation to make people understand how their effort can help solve social problems. UNICEF Tap project and Turn Your Miles (RED) provided participants with their donation results that compare their efforts to the service that the organization will provide. In UNICEF Tap project, when participants finished their challenge, participant’s time was calculated to show how many days of clean water they provided for children in need. In Turn Your Miles (RED), the number of miles one runs was shown with the equivalent value of medication for AIDS and, raised funds.

2.4.2 Motivation

Motivation is a trigger that provokes people into participating in social events. It was shown in a variety ways in different social events. In the Ice Bucket Challenge, there are three main motivations: Fun, being nominated, and challenge by their peer. Watching celebrities or friends’ videos shared by social media makes people laugh, and making the video to challenge a friend is
also very interesting. Another factor that makes it successful in motivation is that each participant is nominated and challenged by their friend so that people who are nominated have great responsibility to the event. Moreover, Setting specific goals can also motivate people to keep doing their activities for donation. The Bank of America, (RED)® and Nike established weekly goals for an 8week donation event period, and total amount of money that can fund when participants achieve their weekly goal. Each day’s achievement was shared via their website. As a result, Nike+ running app users raised over $550,000. That is about 55% of the total donation goal during the 8weeks’ challenge period.

2.4.3 Accessibility

Accessibility is about how easy it is to participate in social events. Even if people want to help others in natural disasters such as earthquakes, if it requests all volunteers to drive their own car to the place to provide daily necessities, people will hesitate to help others. If a social event requires a simple action to help solve the social problem, people are willing to do it several times. The Turn Your Miles (RED) is a conspicuous example of the Accessibility factor in social donation events. Once Nike+ runners pledge to turn your miles on Nike website on one’s smart phones or computer, there is nothing for them to do but running with a device that has Nike+ running app on it. That is what Nike+ runners are usually doing on a regular basis.

In UNICEF Tap project, there are very few actions that are more simple than pledging to turn your miles (RED). After one visits uniceftapproject.org on a smart phone, it requires them to put their phone down for 10 minutes to make a donation. Because of that simple action, one can provide one day of water for children in need when one is taking a shower or having lunch as
long as they do not touch their phone for 10 minutes. Therefore, accessibility also has an important role in making people involved in continued support.
Chapter 3: Service Design for Social Donations

3.1 Social Problem in the US: Child Poverty

There are more than 72 million children under the age of 18 in the United States. They represent 23 percent of the population, but they comprise 33 percent of all people in poverty. Among all children, 44 percent live in low-income families, living with incomes below the federal poverty level – $23,624 a year for a family of four (Yang Jiang et.al. 2015).

Figure 6. Children by family income, 2013
Note: Above low income is defined as at or above 200% of the federal poverty threshold (FPT), poor is defined as below 100% of FPT, and near poor is between 100% and 199% of the FPT. The low-income category includes both the poor and the near poor.

44 percent – 31.8 million – live in low-income families

22 percent – 15.8 million – live in poor families
Figure 7. A league table of relative child poverty, selected OECD countries (UNICEF Innocenti Research Centre, 2012)

Note: Data refer to children aged 0 to 17.

Figure 7 above shows the percent of children living in poverty in the US compared to other industrialized nations. The US has the highest child poverty rate. This deserves attention from political leaders, the press and the public for two reasons.

The first reason is that failure to protect children from poverty is one of the most costly mistakes
that a society can make. Although the heaviest cost of child poverty is borne by the children themselves, their nations must also pay a very significant price – in reduced skills and productivity, lower levels of health and educational achievement, increased likelihood of unemployment and welfare dependence, the higher costs of judicial and social protection systems, and the loss of social cohesion.

The second reason is that children have only one opportunity to develop normally in mind and body. Therefore, the commitment to protection from poverty must be upheld in good times and in bad. A society that fails to maintain that commitment is a society that is failing its most vulnerable citizens and storing up intractable social and economic problems for the years immediately ahead (UNICEF Innocenti Research Centre, 2012).

A household with a low-income has to choose between food and utilities, food and medical care, and food and education. Securing enough food means they have more of a chance to be educated, maintaining better health condition and living environment. For that reason, this study especially focuses on the hunger problem, and related services that aim to help solve that issue in the US.

3.2 Current Service related to Hunger Problem

3.2.1 Feeding America

Feeding America is the nation’s largest and leading domestic hunger-relief organization. Its mission is to feed America’s hungry through a nationwide network of 202 food banks that are the storehouse for food and other products that go out to the community. Feeding America provides
a variety of food assistance programs to help people struggling with hunger by securing food donations from various sources in the food industry. Each year, Feeding America secures and distributes more than 3 billion meals to more than 46 million people facing hunger in the United States, including 12 million children and 7 million seniors each year. They also offer educational programs to fight against hunger in America by raising the awareness of the impact of hunger. The Backpack Program was designed for children suffering with hunger. More than 160 local food banks have been providing more than 450,000 children with nutritious food to take home at the end of the week and school vacations when other resources are not available (Nancy S. Weinfield et.al. 2014).

<table>
<thead>
<tr>
<th>GROCERY</th>
<th>MEAL</th>
<th>FOOD-RELATED BENEFITS</th>
<th>NON-FOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Community Garden</td>
<td>• Community Kitchen</td>
<td>• Nutrition Education</td>
<td>• Clothing/Furniture Assistance</td>
</tr>
<tr>
<td>• Food Bank-Operated Pantry Program</td>
<td>• Food Bank-Operated Meal Program</td>
<td>• Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Outreach</td>
<td>• Financial Assistance</td>
</tr>
<tr>
<td>• Food Pantry</td>
<td>• Group Home</td>
<td>• Supplemental Nutrition Assistance Program (SNAP) Assistance and Outreach</td>
<td>• General Educational Development (GED) Programs</td>
</tr>
<tr>
<td>• Home-Delivered Grocery Program</td>
<td>• Rehabilitation Program</td>
<td></td>
<td>• General Information and Referrals</td>
</tr>
<tr>
<td>• Mobile Market/Mobile Pantry</td>
<td>• Residential Program</td>
<td></td>
<td>• Health Clinics</td>
</tr>
<tr>
<td>• Other Pantry Program</td>
<td>• Shelter</td>
<td></td>
<td>• Housing Assistance</td>
</tr>
<tr>
<td>• School Pantry Program</td>
<td>• (Soup) Kitchen</td>
<td></td>
<td>• Job Training</td>
</tr>
<tr>
<td>• BackPack Program</td>
<td>• Transitional Housing</td>
<td></td>
<td>• Legal Assistance</td>
</tr>
<tr>
<td>• Afterschool Snack</td>
<td>• National School Lunch Program (NSLP) Outreach</td>
<td></td>
<td>• Medicaid/Children’s Health Insurance Program (CHIP)</td>
</tr>
<tr>
<td>• Child Congregate Feeding Program (non-Kids Cafe)</td>
<td>• School Breakfast Program (SBP) Outreach</td>
<td></td>
<td>• Transportation Assistance</td>
</tr>
<tr>
<td>• Day Care</td>
<td>• Home Delivered Meal</td>
<td></td>
<td>• Utility/Heat Assistance</td>
</tr>
<tr>
<td>• Kids Cafe</td>
<td>(or Meals on Wheels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Summer Food Service Program (SFSP)</td>
<td>• Senior Congregate Meal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 8. Program type categorizations used in Hunger in America 2014 (Nancy S. Weinfield et.al. 2014)
Feeding America encourages people to participate in donation programs for providing more food to more children in need. There are two main ways that people can support Feeding America in terms of donation. One is providing a financial donation, and the other is providing food items.

Most supporting programs were designed for making a financial donation, which is the best way to support Feeding America and local food banks. This is because they can take advantage of the buying power of the Feeding America network so that they can acquire and ship healthy, nutritious food at deeply discounted rates. However, their website is used as a touch point for almost all donation programs that people participate in individually. Therefore, when you want to donate money, one should visit their website, and then put a gift amount, billing and payment information. The other way to help local food banks is by donating food. Before one donates food, donors are recommended to contact to their local food bank to figure out what types of items are accepted and to get advice on food safety. It also requires donors to drive to a local food bank to give their gift. Your local food bank will need to sort and inspect all donated items to ensure that they are absolutely safe.

<table>
<thead>
<tr>
<th>Ways to help</th>
<th>Financial Donation</th>
<th>Food Donation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Donation Gift, E-Card, Once or Monthly</td>
<td>Fundraising</td>
</tr>
<tr>
<td>How it works</td>
<td>1. Visit Feeding America website or local food banks’ website. 2. Fill out gift amount, billing info, and payment info.</td>
<td>1. Create page by setting your goal 2. Ask others to donate 3. Help Feeding America when you reach your goal.</td>
</tr>
<tr>
<td>Donation Partners</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Touch point</td>
<td>Website,</td>
<td>Website</td>
</tr>
</tbody>
</table>

Table 4. Analysis current donation programs
3.2.2 Analysis Feeding America Donation programs

Current donation programs were analyzed with empathy, motivation, and accessibility aspect to determine its weak points, and opportunity areas to make a better service model.

<table>
<thead>
<tr>
<th>Empathy</th>
<th>Motivation</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1=10 meals</td>
<td>Encouraged by</td>
<td>Website, Mail</td>
</tr>
<tr>
<td></td>
<td>friends / family</td>
<td>Auto Pay</td>
</tr>
<tr>
<td>$1=10 meals</td>
<td>Make it happen</td>
<td>Website</td>
</tr>
<tr>
<td></td>
<td>together</td>
<td>Website</td>
</tr>
<tr>
<td>$1=20 meals</td>
<td>Self-motivated</td>
<td>Website</td>
</tr>
<tr>
<td>10 meals from</td>
<td></td>
<td>Food drive,</td>
</tr>
<tr>
<td>sponsor</td>
<td></td>
<td>Store, Office</td>
</tr>
<tr>
<td>N / A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>items</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Three aspects in current donation programs

Feeding America has partnered with a variety of media such as Fox sports and the Disney/ABC Television Group to raising awareness of the hunger issue in the US and to encourage Americans to fight hunger in their communities, so that most Americans are fully aware of the issue. Therefore, it looks like there is no problem in terms of empathy.

However, it is somehow unclear the value of donation on the Feeding America website. Feeding America mentions $1 has the equivalent value with 10 meals. It has a huge difference with the donation value mentioned on a local Food bank’s website which is mostly 3 meals. This is related to trustworthiness, which is one of the empathy factors.

The main weak point of Feeding America’s donation program is lack of motivation. It has something to do with the accessibility aspect. Regardless of donation programs and its
partners, Feeding America relies on its website as means of getting financial support from their donors. It means there is less of a chance of sharing donation activity by showing what donors are doing to support Feeding America.

Overall, Feeding America’s donation programs are required to develop a variety of touch points that can encourage people to support Feeding America’s effort in solving hunger issue by sharing each others participation, and that provide the way in which people can easily involve in donation programs.
Chapter 4: Design Development

4.1 Concept Generation.

Empathy, motivation, and accessibility were explored through a co-ideation section to discover the core value of each sector. And then it applied to developing user interface design elements that are suitable for the new concept model.

Figure 9. Keywords for social donation service design
A project concept was developed based on insights that come out from analysis of current donation models.

Figure 10. Current food donation model

Figure 10 illustrates the current system of collecting food items for helping to solve the hunger problem. It is now required for donors to drop food off at a local food bank. Or a local food bank drops off collection barrels to locations where people are doing food drives and then picks them up.

A new donation model concept utilizes the infrastructure of Kroger, which is the nation’s largest supermarket chain, and spends $250 million-a year for charitable activity (Alexander Coolidge. 2013). The grocery store is where people usually visit once a week to purchase food items, and it is also where we can see all food items that Feeding America wants to secure for their food distribution programs.
Rather than drop food off by the individual, in the new donation model described in figure 11, food items purchased by donors will be delivered directly from local grocery retailers to local food banks. By combining a donation service with the grocery shopping experience, the donation model for helping solve hunger can be part of everyday life in the same manner as grocery shopping.

A new concept scenario in Figure 12 describes what a personalized shopping experience for social impact would be like. It was developed based on current shopping experiences and donation processes that were illustrated in Figure 10.
Currently, customers can download smartphone apps for large chain grocery stores such as Kroger. These apps allow customers to receive weekly ads and coupons, as well as make their

![Figure 12. Personalized shopping experience scenario for social impact](image-url)
shopping lists before they arrive at the store. The personalized shopping experience for social impact was designed to operate together with grocery store’s smart phone apps, and it will allow users to add friends for sharing their participation in donations.

A portable barcode scanner that one can get in grocery stores will be used as a touch point for shoppers to get involved in solving hunger problems. There are four main features of the scanner: showing their own shopping list, giving nutritional information on food items, the location of food items in-store, and providing opportunities to donate to support local food banks. Customers can download their shopping lists that they made on their smart phones to the barcode scanner. Customers who do not have their account or smart phone also can make their shopping lists by looking up food items. The scanner provides nutrition facts for all items in the store so that users can easily compare one item they plan to buy with a similar one by scanning the barcode on each item. It also gives the location of food items in-store where they can find items on their shopping list. The most importantly, it provides customers with opportunities to get involved in supporting local food banks.

While customers are grocery shopping, they will receive a notification when they scan local food banks’ most needed items, or when customers rich a location of one of the items if they have it on their shopping list. The notification for donation will be displayed on the barcode scanner’s screen with information that tells customers how many items local food banks need for their food support programs, and the value of their donations and efforts in solving hunger problem in the US. If customers want to support local food banks’ food securing, they can add the food items
Financial donations will be paid when customers pay for their purchases, and it will be recorded for charitable tax deductions. Customers’ donation activities will be posted on social medias, and shared with their friends whom they add to friend lists on their smartphone app.

Figure 13 visualizes what data and information will be translated between consumers, retailers and food banks in the personalized shopping experience scenario for social impact.

![Eco System](image)

Figure 13. Eco System

1- Weekly ads and coupons will be sent to customers, and social problems and donation programs will be noticed while they are shopping.
2- Pay for donation food items at a retailer.
3- Food shortage info is sent to retailers
4- Donated items are delivered by retailers into food banks.
5- Food banks are supported by sharing consumer’s donation activities.
6- Beneficiaries’ stories and donation reports are sent to consumers.
4.2 Concept Development: Prototype

4.2.1 Device Prototyping

Prototypes were developed in order to learn more about the project concept and get feedback from people who will be involved in this donation service. The shape of the barcode scanner was explored through a process of sketching to prototyping. The first considerations were determining a position where the barcode scanner could be detached, and how it would be. As a result of these considerations, three prototypes were developed.

<table>
<thead>
<tr>
<th></th>
<th>Shape</th>
<th>Attaching</th>
<th>Display &amp; Scan</th>
<th>Interface</th>
<th>Stability</th>
<th>Durability</th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td><img src="image" alt="Type A" /></td>
<td><img src="image" alt="Type A" /></td>
<td><img src="image" alt="Type A" /></td>
<td><img src="image" alt="Type A" /></td>
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<td><img src="image" alt="Type C" /></td>
</tr>
</tbody>
</table>

Figure 14. Barcode Scanner Prototypes

Type A has a docking position. Type B has a banding structure so shoppers can hang it wherever they want on their cart. The shape of Type C is designed to fit the shape of the cart handle so that it can be attached in any position on a cart handle. The prototypes were evaluated on stability, durability, and flexibility.
I selected Type A as the final design direction for this project because it got higher scores on stability and durability, and lower score on flexibility. Stability and durability are important aspects because of the maintenance issue of the device that will be used in a public place. Moreover, getting a lower score on flexibility means that it has less chance to be dropped by customers. In Type A, the center of a shopping cart handle was used as a position for attaching the scanner to give shoppers enough space to put their hands on both sides. In this way, they can also control their cart freely, and can use their hands to pick food items up for scanning.

4.2.2 User Interface Prototyping

Figure 15. Donation Notification Interface Prototypes
Figure 15 describes how three design considerations were applied to interface design for the donation notification: empathy, motivation, and accessibility. Showing donation purpose, its value, and weekly goal for each food item were considered for empathy. Weekly goal also intended to motivate people to participate in the donation service. The interface presents simple yes or no question, and suggests a small donation amount for improving accessibility.

4.3 Design Proposal

Figure 16. A Barcode Scanner Design for Social Impact
Figure 16 illustrates the look and feel of a barcode scanner and its interface in a place where it will be used. 5.7 inches display was applied to the barcode scanner to make sure that users could see the notification message clearly regardless of their eyesight. The device’s colors and materials were used according to a grocery store’s band identity. It was shown to participants to better understand about the concept of personalized shopping experience for social impact before they evaluate it.

### 4.4 Evaluation

#### 4.4.1 Study Plan

A personalized shopping device’s interface was evaluated to figure out how design aspects can improve the level of empathy, motivation, and accessibility, and can change the frequency of participation in donation to food banks. Interface of Gift Catalog, which is one of Feeding America’s donation programs, was compared with the new donation model. Participants rated three criteria in donation model A, Feeding America Gift Catalog and model B, Donation with a Personalized Shopping Device. Through open-end questions, they were asked to explain their ratings of each model.
4.4.2 Results

Eight Americans participated in the evaluation: five were students ranging in age from 23 to 27; and three were professionals, all over the age of 45. As the results in Figure 16 show, the level of each criterion in Model B scored higher than Model A. Model B scored a 6.9 in empathy compared to 4.3 in model A. The level of motivation in model B was 2.6 levels higher than model A. The differences in the level of accessibility were smaller than the differences in empathy and motivation; Model A scored a 7.9 and Model B scored a 9.5 in accessibility.

The level of empathy was higher because participants felt that they were more connected to, and involved in donation model B. The motivation level was higher because participants understood the kind of food items the food bank needed, and the donation goals they were trying to reach.
The level of accessibility was slightly higher due to the donation amount option being flexible, and lower than the minimum gift amount in donation model A. Convenience and simplicity of the overall donation process in model B also contributed to the difference in accessibility scores. Because of all these reasons, participants stated that they were more likely to donate using model B whenever they are grocery shopping.

![Figure 18. Expected Change in Donation Frequency](image)

**4.4.3 Discussion**

The most important factors that caused differences in the scores of the donation models A and B were that participants were already in a place where they can contribute to helping people who suffer from hunger. In the moment, they are thinking about providing food for their family and wanting to help someone else do the same. This is a different experience than going to website from home or work. These two key differences made participants feel more connected to the problem so they were more motivated in model B than A. Therefore, accessibility in model B leverages motivation and empathy aspects. When asked to rate each model on levels of empathy, motivation, and accessibility, participants’ ratings consistently scored model B higher.
Even though donation model B got higher scores in the level of empathy than model A, participants wanted to get more information and pictures that could provoke them to feel emotional connections to hunger issues. The higher scores in model B had influence on an expected change of donation frequency. In donation model B, anticipated change in donation frequency was directly related to how often participants are grocery shopping. People over the age of 45 will be more likely to participate in the donation program than participants between the ages of 23 and 27. This is because their grocery shopping frequency was higher than younger participants, and the participants aged 23 to 27 were living on a tight student budget.
Chapter 5: Conclusion

5.1 Implication

The main goal of this study was finding a way in which people could provide continued support to help solve child hunger, a consequence of poverty in the US. Continued support is important for social impact because child hunger cannot be solved in a short period of time. A continued support model can also contribute to raising awareness of social issues by constantly reminding the public of the problem.

In this study, a new personalized shopping experience for social impact was developed based on three design considerations that came from successful social events: empathy, motivation, and accessibility. A new donation model was combined with the shopping experience to support food banks. In the donation model, people received a notification reminding them of hunger issues while they were grocery shopping. According to the evaluation test and interviews, accessibility played an important role in leveraging the level of motivation and empathy. As a result, participants were more likely to support food banks with the donation model suggested in this study. Therefore, the three design considerations mentioned above could be applied to design projects that aim to alleviate the effects of social problems, and to raise awareness of social issues.

5.2 Future Work

To introduce the concept model into the market, additional research on technology and the overall eco system (See Figure 13) is necessary. Developing a more intuitive interface design of
the barcode scanner is also required. Regardless of the level of knowledge and experience about digital devices, all grocery stores’ consumers should be considered as users of the device. Moreover, it is required to find durable materials that can withstand daily use by the public. After developing the system and devices, the next step is launching the new donation model in a flagship store to keep track of its long-term effects, and to monitor its performance and success.
Appendices

Appendix 1: User Interface Test Materials

Donation Model A:
How Your Gift Helps

Your gift through this catalog will help Feeding America in our efforts to supply nutritious, fresh foods to the millions of Americans who struggle with hunger through our network of 202 food banks across the country. Your gift enables our food banks to more effectively deliver our mission. All donations are tax-deductible to the fullest extent of the law.

Give a Special Present to End Hunger

Give the present of fresh, healthy food to families in communities across the country. With your help, Feeding America is helping to provide nourishing foods to Americans who are struggling with hunger. Your gift of nutritious food gives the gift of a healthier lifestyle, a present that truly keeps on giving.

- Give Apples: $25
- Give Peanut Butter: $50
- Give Rice: $15
- Give Broccoli: $25
- Give Chicken: $45
- Give Cheese: $30
- Give Oatmeal: $20
- Give Bananas: $35
Thank you for choosing a gift that helps Americans struggling with hunger. Please review your gift selection carefully before checking out.

You currently have 1 item totaling $25.00 in your cart:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Name</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Broccoli (525.00 each)</td>
<td>$25.00</td>
</tr>
<tr>
<td></td>
<td>Gift amount</td>
<td>$25</td>
</tr>
<tr>
<td></td>
<td>Total price</td>
<td>$25.00</td>
</tr>
</tbody>
</table>

Your gift through this catalog will help Feeding America in our efforts to supply nutritious, fresh foods to the millions of Americans who struggle with hunger through our network of 200 food banks across the country. Your symbolic gift will be used where it is most needed to help us efficiently and effectively deliver our mission. All donations are tax-deductible to the fullest extent of the law.

Fill out the form below to complete your gift purchase.

Billing Information
You currently have 1 item totaling $25.00 in your cart.

**Billing Name**
*First Name:*
*Last Name:*
*Email Address:*

**Billing Address 1**
Billing Address 2:
*City:
*State:
*Zip:
*Country:

**Credit Card Information**
*Card Number:*
*Expiration Date:*
*Cardholder's Name:*
Thank you for choosing to give a present from the Feeding America gift catalog. Your support will make a big difference to the cause of feeding struggling families. Your gift recipient will also appreciate the thoughtful and unique donation made in his or her honor to help hungry families.

You will receive an email confirmation of your gift within moments. Please keep this for your receipt.

Very truly yours,

Bob Alton
Chief Executive Officer
Feeding America

Date: Oct 9, 2015 12:24:39 PM
Feeding America ID: 40-967999
Total Purchase Amount: $25.00
Payable to: $25.00
Tax Deductible Amount: $25.00

Quantity | Item Name | Card Recipient | Total Price
---|---|---|---
1 | Broccoli | 1 card will not be sent for this room. | $25.00

Total Price of Items: $25.00

Feeding code: 1001-7811-25-2277633-2002054

A copy of this information will be emailed to erinoustang92@gmail.com for your records.

---

Thank you for shopping in our gift catalog!

Dear Miranda,

Thank you for your generous contribution to the Feeding America gift catalog. Your support will make a big difference to the cause of feeding struggling families here in your local community and across America. Your gift recipient will also appreciate the thoughtful and unique donation made in his or her honor to help hungry families.

If you choose to send an e-card, these will be sent immediately.

If you choose to send a gift card, your gift recipient will receive a card to download, print out and send to your recipient.

On behalf of everyone at Feeding America, thank you for your support.

Very truly yours,

Bob Alton
Dear Friend,

On behalf of all the men, women and children you’ve helped, thank you. I’m so grateful that you’ve decided to join Feeding America in the fight to end hunger.

Your generous support helps the Feeding America network of food banks bring fresh produce and groceries to people who are struggling with hunger in your community and across the United States. Together, we’re feeding children after school, helping seniors in need, fueling mobile food pantries and so much more. And that’s why I’m hoping you can send another gift soon.

In the United States, 70 billion pounds of food are wasted while 49 million people are facing hunger. With your help, the Feeding America network can rescue this perfectly good food and get it to those who need it most.

People in need are counting on us—and we’re counting on you. I hope you will continue your support today. Remember, every dollar you give helps secure and distribute $19 worth of food through the Feeding America network of food banks for families in need. Together, we can do so much good in this world...together, we can solve hunger. Thank you so much.

Very truly yours,

Bob Aiken
Chief Executive Officer

Feed America one gift of $25 and help provide $525 worth of food and groceries for your neighbors facing hunger. Thank you today!

Yes, I want to help in the fight against hunger

Please use my gift to help secure and distribute much-needed food through the Feeding America network of food banks. I am enclosing:

$25  $35  $50  $____ (other)

I wish to make my gift by credit card.

Make checks payable to Feeding America

Bob Aiken
Chief Executive Officer

Scanned by the Feeding America team

Please include your name and address

Marilyn Ring
321 Blaine State Bank C39
Cincinnati, OH 45229-2401

024783680 000 K152HD1

Donation Model B:
Scan Plus Card

My Shopping List

Add Item: e.g. "milk"

- **Progresso Rich & Hearty Noodles**
  - $3.49 ea WHEN YOU BUY 5 Items with Card
  - Food Bank Item

- **Kraft Mayo**
  - $2.49 ea WHEN YOU BUY 5 Items with Card

- **Chicken of the Sea White Tuna**
  - 10 for $10 with Card

Maps
My Shopping List

Food Bank Item: 48  Weekly Goal 90
Would you like to donate $1 for 3 ea?

YES  |  NO

My Shopping List

Food Bank Item: 51  Weekly Goal 90
I would like to donate $1 for 3 ea.

Cancel  |  $1  |  Done

My Shopping List

Thank You
To edit your donation, go to Gift
My Shopping List

- Progresso Rich & Hearty Noodles
  $3.49 ea WHEN YOU BUY 5 Items with Card
  Food Bank Item

- Kraft Mayo
  $2.49 ea WHEN YOU BUY 5 Items with Card

- Chicken of the Sea White Tuna
  10 for $10 with Card

My Gift

- Progresso Rich & Hearty Noodles
  $1 for 3 ea
  $1

- Chicken of the Sea White Tuna
  $2 for 6 ea
  $2

Total
$3
Appendix 2: User Interface Evaluation Questions

Name: __________________________ Age: __________________________

- Donation Model A: Feeding America Gift Catalog

Feeding America's Gift Catalog is a food donation program that you can give a special present of fresh, healthy food to families in communities across the country. You can participate in the donation by visiting the Feeding America website. You will be able to see pictures of food items and its price. When you choose a gift of meals, your billing address and card information will be required to fill out a purchase order form.

- Definition

Empathy: Understanding exposed Problems, and the value of donations

Motivation: A trigger that provokes people doing their participation in social events

Accessibility: How easy to participate in donation models

A-1. How would you rate the level of empathy in donation model A?

Level 0 1 2 3 4 5 6 7 8 9 10 Level 10

A-2. How would you rate the level of motivation in donation model A?

Level 0 1 2 3 4 5 6 7 8 9 10 Level 10

A-3. How would you rate the level of accessibility in donation model A?

Level 0 1 2 3 4 5 6 7 8 9 10 Level 10

A-4. How often are you willing to participate in donation model A?

1) Once a week 2) Once two weeks 3) Once a month 4) Once a quarter 5) Other: ______________
- Donation Model B: Donation with Personalized Shopping Device

In donation model B, you can donate money while you are shopping at Kroger. You will receive a notification when you are looking at an item needed by a local food bank for their weekly food support program. The food bank’s weekly goal, and the value of donation will be displayed on a device attached to a shopping cart. You can participate in donation model B by giving an answer to the question in the notification.

- Definition

Empathy: Understanding exposed Problems, and the value of donations

Motivation: A trigger that provokes people doing their participation in social events

Accessibility: How easy to participate in donation models

B-1. How would you rate the level of **empathy** in **donation model B**?

Level 0 ———— 5 ———— Level 10

B-2. How would you rate the level of **motivation** in **donation model B**?

Level 0 ———— 5 ———— Level 10

B-3. How would you rate the level of **accessibility** in **donation model B**?

Level 0 ———— 5 ———— Level 10

B-4. How often are you willing to participate in **donation model B**?

1) Once a week  2) Once two weeks  3) Once a month  4) Once a quarther  5) Other:______________
B-5. If you rate different level of empathy between model A and B, what caused the difference?
______________________________________________________________

B-6 If you rate different level of motivation between model A and B, what caused the difference?
______________________________________________________________

B-7 If you rate different level of accessibility between model A and B, what caused the difference?
______________________________________________________________

B-8 If your choice for question B-4 is different with question A-4, what caused the difference?
______________________________________________________________
Appendix 3: Summarized User Interviews

B-5. If you rate different level of empathy between model A and B, what caused the difference?

Model B is in person and in the moment when you need food. It is more likely to appeal to a shopper to donate in real time. I participate in process. I understand what they need. Buying moment. The understanding of need is not out of sight, out of mind. Daily reminder.

The second model didn't give the user the chance to read about what the donations for. It needs to show where donations will go. Pictures or link for more detail information, Touching Feeling, Show person pictures that evoke more emotional suspense

B-6. If you rate different level of motivation between model A and B, what caused the difference?

I rated same level because it is for the same cause. The second model motivates more by showing the donation goal they are trying to reach. I am in the place where I can help other, feel more connected with the problem. I am more motivated if the prompt to donate B presented to me, rather than going site to do so. I understand what they need. My motivation would change based on the frequent accessibility.

B-7. If you rate different level of accessibility between model A and B, what caused the difference?

It is easily accessible and simple to work with. The second model is far more accessible since it is available whenever the user shops for groceries. Wide range of interfaces. Lower cost & more flexible options. It is easy to pay for donation. With A, I have to go to a site, with B, I am already ready to pay money. The buying moment: It is convenient when I am buying for myself, and I am helping your family too. I would have to seek out model A. Model B is easier to use. You are already there.

B-8. If your choice for question B-4 is different with question A-4, what caused the difference?

A: I only grocery shop once a month, and donation is easy to keep track of with a monthly budget. (Once a month –>> once a month)

B: I’m more willing to donate more with option B because I am already spending money on groceries so I am willing to donate more for charity.

C: Cost range is more affordable. (Once a quarter ->> Once 2 weeks)
D: I go shopping weekly so I am exposed to model B weekly. (Once a year -&gt; Once a week)

E: Every time when I am grocery shopping. (Once a year -&gt; Once 2 or 3 days)

F: I would have a reminder weekly of the need and the availability would follow me to the grocery store. (Once a year -&gt; Once a week)
Bibliography


