Interaction Design Studio I
A4 - IoT Kickstarter Video

Process Book

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Initial ideation and technology

Our group initially wanted to work with the first idea of a restaurant information application, which uses a camera with facial recognition and sensors. However, the feedback we received for this idea in the first crit session was that it is difficult to see how restaurant owners would want to use this application because the app doesn't provide any direct value to them. Also, it was mentioned that the application could reduce the number of customers for a restaurant if it is already performing badly, and if customers can know that from the application. So we changed our direction and decided to work on the second idea of a Faraday cage grocery shopping cart.

First Set of Ideas

Initial Idea: Camera ID and Sensor - An application that registers the number of customers in each restaurant, and shows the users how crowded restaurants are + using facial recognition to measure how satisfied/ unsatisfied customers are.

Final Idea: Inventory Bag - Improving grocery shopping experience using a Faraday cage cart with a RFID reader, RFID tagged groceries, and an application to assist the users while shopping (one-click checkout button, the user can enter shopping list and the application will remind if the user forgets anything, etc)

Other Ideas
+ Micro Location - Using an attachable microscale sensors to locate valuable items.
+ Connected Scale - Using a network of connected scales over city to improve traffic.

Scenarios for video

1. Edward wants to know which brand of chips is healthier. He puts two different bags into his cart and opens up the SmartCart app. The app displays nutrition facts for the two brands side by side for easy comparison and Edward is able to choose the one he prefers.

2. Kim has SmartCart on and is picking up groceries. She leaves the produce section and gets a notification on her phone stating that lettuce was on her list, but she forgot to pick it up. She heads back to the produce section to get a head of lettuce.

3. Stewart is running late and has to pick up his kids from soccer practice. Skipping the long checkout line, he uses the SmartCart app to check out and is ready to leave in seconds. He makes it to the soccer field with five minutes to spare.

4. Nikki is doing a lot of shopping, but needs to keep track of her budget. As she places items into her cart, her SmartCart app automatically updates with her total. Since she gets immediate feedback, she can add or remove items accordingly.

5. Ralph manages a store that recently switched from the traditional cashier system to SmartCart. His store gained a significant amount of space at the front of the store by removing cash registers and can now add more products to his inventory. With shorter lines and more products, Ralph's store sees a jump in sales and increased customer loyalty.

6. Ben's wife asked him to do the grocery shopping today, but he's unfamiliar with the exact items he needs to buy. With SmartCart, he has access to their shared shopping list and can see what his household usually needs. He is able to have a smooth shopping experience without needing to call his wife.

7. Emmanuel wants to make lasagna for dinner, but doesn't know the recipe. With SmartCart, he can look up several common recipes and their ingredients. The app directs him to where in the store specific ingredients are and how much he needs to buy, so Emmanuel can make the perfect lasagna.

8. Jessica is running late and didn't have time to make a grocery list this morning. Since she's a frequent -

- SmartCart user, the app has a compiled list of her most frequently bought items. Using this list, Jessica is able to get everything she needs without wasting time worrying.

9. Jeanine is cooking her famous souffle for her daughter's birthday party, but can't find the cocoa powder she likes to buy. She uses SmartCart to look up the brand and finds that it's no longer in stock at this store. However, with SmartCart's smart stocker, Jeanine sees that the powder will be back in stock in 2 days and has one sent straight to her house.

10. Martha owns a struggling grocery store in an upscale neighborhood and wants a competitive edge over the competition. She decides to try out SmartCart to eliminate waiting times and increase inventory. Her store receives more business as shoppers are enticed by a faster and more pleasurable shopping experience.

Product design and research

Product

SmartCart - A Faraday cage cart and an application that assists the users during shopping.

Target Audience

Large-scale, mid to high end grocery stores.
ex.) Trader Joe's, Whole Foods Market

Purpose

1. To cut the operating cost by reducing the number of cashiers.

2. To improve the customer's experience by eliminating the waiting time.

3. To let stores make better use of their store space by removing check-out counters.

Related Statistics

- Average salary of a cashier is $20K
http://www.payscale.com/research/US/Job=Cashier/Hourly_Rate

- People spend more than 10 years of their life waiting in line
http://www.tesh.com/articles/the-average-person-will-spend-10-years-standing-in-line-over-their-lifetime/

- The cost of a single RFID tag is as low as 7 cents
https://www.rfidjournal.com/faq/show?85

- The average profit margin of grocery stores is about 1~3%
http://smallbusiness.chron.com/profit-margin-supermarket-22467.html

Storyboards

James has an important meeting coming up that will take most of his day. He needs to buy groceries for tomorrows dinner but doesn't have the time to wait in line at a busy grocery store.

James goes to the smart grocery store and is able to buy and checkout all of his grocery items in <10 minutes. The RFID tags allow him to quickly purchase everything in his bag without need for a line

James makes it to his meeting on time and now has groceries for tomorrow.

Karen is deciding between two bags of cookies, but doesn't want to give her kids unhealthy snacks.

She puts both into her cart and they are loaded onto the app, where she can view and compare nutrition information.

She's able to find the healthier option and removes the other one from her cart.

Initial Idea for Scenes

1. Problem: grocery store too crowded

- Karen, a busy working mother, needs to pick up groceries but only has an hour between when her job ends and picking up her son from soccer practice. She knows that Giant Eagle is always way too crowded at this time, but she also needs to pick up cake mix for her daughter's bake sale this week, as well as other groceries. What should Karen do?

2. Solution: new store w/ RFID without cashier

- Our solution is SmartCart: an innovative and enhanced shopping experience that improves shopping efficiency.
- In SmartCart market, each commodity is attached with a RFID tag, which contains information including price, nutrition and expiration date of the item.
- Showing a box of cereal with RFID tag

3. Customer shops around carrying a basket/cart embedded with RFID reader

- Karen downloads the SmartBag app. Karen walks into the store and inserts her credit card into the machine. It gives her cart 10, a new kind of cart with a Faraday cage that can track what items are placed into it.

4. Customer put all of the items she want into the cart

- She goes around the store and picks up all of the items she want. She notices that the app has a shopping list feature, in which users can input what items they need to buy. As she taps check out, the app reminds her that she is missing a gallon of milk from her grocery list, she goes back and puts it in her cart.

5. Customer checks the nutrition on the app

- Karen is deciding between two bags of cookies, but doesn't want to give her kids too much junk food. She puts both into her cart and they are loaded onto her phone. She is able to compare nutrition information and chooses the organic, whole grain cookies over the sugary ones.

6. Customer checkout on the app

- When Karen is finished, she simply presses checkout on the SmartBag app. She puts her groceries in her car and returns the cart to the store, at which point her credit card (which has already been charged) is released. This prevents shoppers from stealing carts or baskets.

Revised Scenario

7. Customer is happy and goes home

- Karen is very happy with the improved efficiency and ease with which she can shop. She doesn't have to wait in line or get her items checked out by a cashier. She heads to soccer practice with 15 minutes to spare.

8. Stats

- RFID tags can cost as low as 7 cents
- Walmart spends tens of billions of dollars a year on cashier salaries
- Americans annually spend 37 billion hours waiting in line, according to the New York Times

Scene 1: Americans annually spend 37 billion hours waiting in line - text overlayed on a shot of customers waiting in a line. Background image showing crowded cashiers, stats over the image: [How much is spent on cashiers] Walmart spends tens of billions of dollars a year on cashier salaries

Scene 2: Introducing SmartCart - this cutting edge technology uses RFID tags to allow grocery store customers to seamlessly check out of a store by automatically tracking the cost of the groceries in your cart. This technology will save time for consumers and increase efficiency for grocery stores.

Scene 3: Woman walks out of office after work, her phone's text message tone plays, she pulls out her phone, has a text "Excited for the dinner party! See you at 7!" She looks surprised and a little worried It's clear from her expression that she forgot about the party, Clock in corner of screen fades in, showing 5:30 PM. She hurriedly puts her phone away and begins to leave (presumably to the grocery store)

Scene 4: at the grocery store, it's now 5:35 and she has the list of items on her phone. Woman hurries

through store, picking up items. Show a cereal box with RFID tag. As the woman put it into the cart, show the RFID reader that is embedded on the cart. Next show the screen of the app, indicates that the cereal is added to the list as well as other commodities she picked before. The clock increases steadily.

Scene 5: It's 5:40
She begins to walk away from the aisles, a tone on her phone plays: App notification: "You picked up pasta, but no sauce. Pasta sauce can be found in aisle 4." She hurries back to get sauce and puts it in her cart.

Scene 6: It's 5:45
Woman finishes getting her groceries and begins to head to the cash register, looks up towards cash register and imagines a long line (in sepia/black and white?). She taps the SmartCart icon on her phone and the line disappears. The phone has a list of the items she currently has in her cart. She presses 'Checkout' and walks out of the store smiling.

Scene 7: It's 5:50
She walks out of the store and glances at her phone. App notification: "Your card has been charged $57.44 for today's trip to Giant Eagle."

Scene 8: It's 7:00
We are now in the woman's home, she places a tray of freshly cooked food on the table when the doorbell rings. She goes and opens the door to greet her dinner party guests, they are excited to see each other, fade to black as the guests begin to enter her home.

Scene 9 (conclusion):
Happy music
Refer back to statistics in the beginning of the video with the addition of SmartCart: "With SmartCart, 0 hours would be spent waiting in line in grocery stores" "RFID tags' low cost of ~7 cents could lead to huge savings for grocery stores", "SmartCart allows for much higher customer volume and increases store efficiency" then Fade to SmartCart logo.

Final script

Screens	Narrations
1. Intro to Nila *2. Nila walks up stairs and gets text reminding her that she needs to pick up groceries and cook time is 5:30*	*1 + 2. This is Nila and she forgot about a dinner party she's hosting tonight. She needs to buy groceries and cook a meal before her guests arrive.*
3. Nila looking worried on her way to the store	*3. She's worried about a long line at the grocery store and having to postpone the dinner party.* *On average, people spend more than 10 years of their life waiting in lines.*
4. SmartCart logo + some graphics like money, graphs, people, clock	*4. Introducing SmartCart: a revolutionary solution that will eliminate grocery store lines, improve store efficiency, and permit increased customer volume.* *The average salary of a cashier is 20 thousand dollars and cash registers take up valuable floor space at the front of a store, the most frequently visited and profitable section. Smartcart eliminates the need for cash registers and allows for larger inventories. The smartcart team believes that these changes will create more profitable stores and happier customers*

5. Little transition of Nila walks into grocery store, show the environment, Nila takes a cereal box off the shelf and looks at it, the RFID tag is clearly in view, video freezes and has a pointer to RFID tag : [time is 5:40]

5. Cutting edge modern RFID tags cost as low as 6 cents and uniquely identify each product in the cart.

6. Top down view of cart, Nila places the cereal box into the cart, freezes and has a pointer to the cart

7. Nila finishes placing the box in her cart, and begins to walk forward to continue shopping, a pointer from her pocket displays a phone screen with cereal checked off

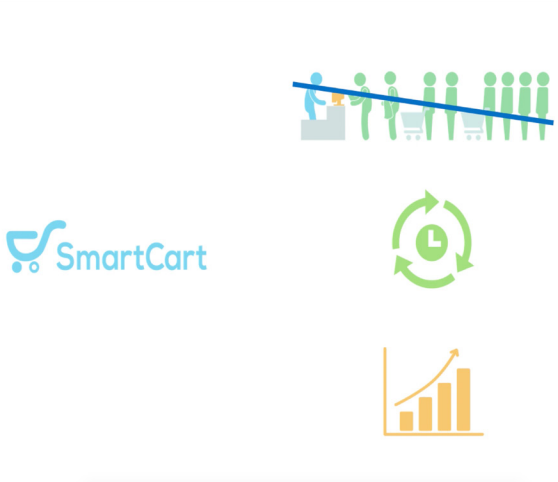
6+7. Faraday cages built into the shopping carts automatically calculate the total cost and update the SmartCart mobile app to reflect the products in the cart.

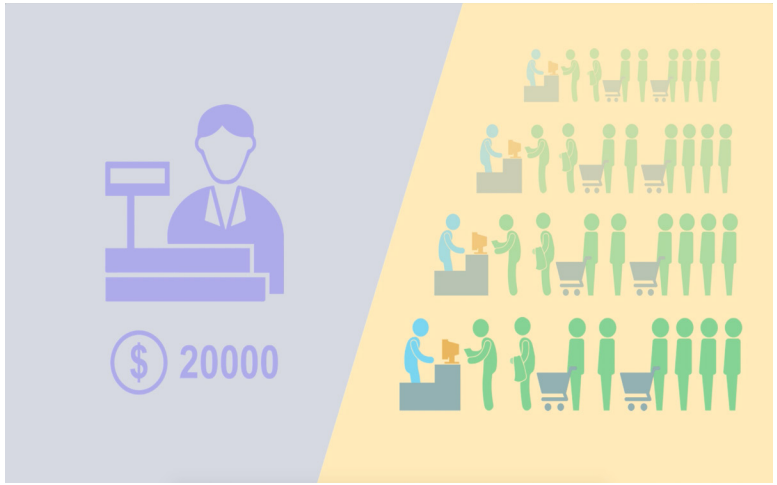
8. Transition (slide in from left to right), time in bottom left has changed to 5:50. Cart is noticeably more full and she begins walking towards the cash register. She gets a notification and sees that she forgot pasta sauce, she turns back and gets it (not shown)

8. It also reminds users if anything on their grocery list is missing from their cart

9. Nila looks at the clock/her watch and smiles, knowing that she has enough time to get home and cook, she taps "pay" on the smartcart app and walks out of the store - fade to black	*9. SmartCart saves Nila from waiting in line and allows her to get right to cooking dinner for her guests*
10. Fade in to a view of a table, food is set upon it and a doorbell rings, Nila opens the door and her guests are here, fade to smartcart logo	*10. No narration, just background music*

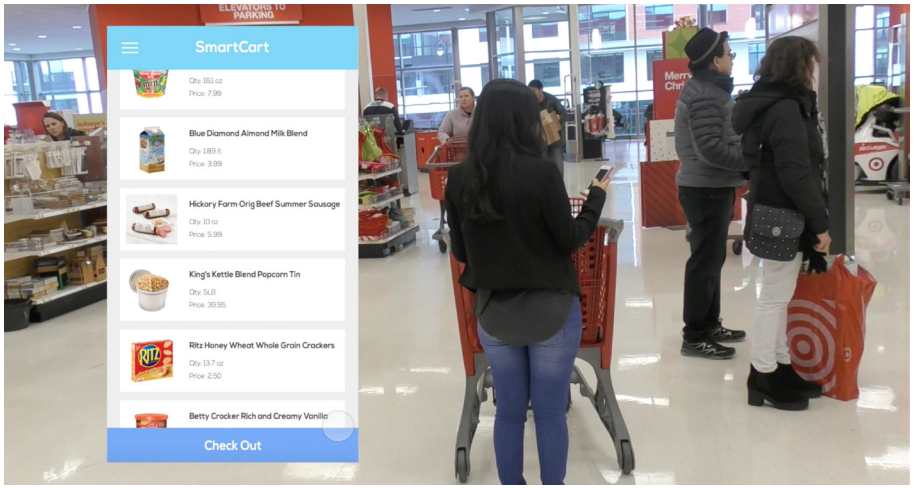
Final video





- Store Efficiency
- Larger Inventories
- Profitable Store
- Happy Customers


SC SMARTCART now
Your cart is missing tomato sauce.
Don't forget to buy some!
Slide for more
Sale
3 for 12


SmartCart
Blue Diamond Almond Milk Blend
Hickory Farm Orig Beef Summer Sausage
King's Kettle Blend Popcorn Tin
Ritz Honey Wheat Whole Grain Crackers
Check Out