

In-Store Shopping Experience

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Contribution Summary:

- **Adya** - User Needs Summary, Brainstorming documentation, Storyboard sketching, Design choice
- **Aman** - Brainstorming documentation, Design Alternatives, Reflection summary
- **Deepa** - Brainstorming documentation, Design Alternatives, Reflection summary
- **Vinaya** - Brainstorming documentation, Design Alternatives, Reflection summary

Feedback Request: What specific feedback would you like on this project? What questions do you have about moving forward with your project?

- Do we need to revise our problem statement based on storyboarding?
- Are we correctly identifying key user needs?

User Needs Summary:

Our three key user needs on the basis of the interviews and observations are:

1. Time-saving
2. Cost Effective
3. Inclusivity

After looking at the Relational Map we made for our second affinity diagram in D2, it was obvious to us that we needed to condense the dislikes users have, to some broad categories in order to move forward in our project. After examining all the things people mentioned they didn't like about in-store shopping, we started seeing some patterns and we narrowed it to three key user needs, as mentioned above.

Two of the interviewees mentioned time as a major constraint while they are shopping. The first one was a PSU student and he frequents Fred Meyers and Safeway as a matter of convenience because they are located on the route of his transit to and from college. Another interviewee who has been an employee at Intel for 7 years, is married and has a 3-year-old boy, also mentioned that time is of the essence to him when he is shopping. He gives the example of how he chooses to go to stores that are either open for long hours in the night and that allow him to shop quickly as his son is with him.

The other interviews brought forth the idea that users were also focused on finding lower prices for items when shopping. One of the interviewee's said she makes different lists according to the store she is planning to visit. These lists segregated items on the basis of their prices and the variety available in stores. People expressed that they find irregular pricing and finding/adding coupons in the store is troublesome at times. They would prefer a way that ensures that they are getting are the best deal for their buck.

The final thing that the international students we interviewed mentioned is that it was difficult for them to shop for groceries when they first came to the United States. An interviewee gave the example that it was exasperating for her to go to the store to get a basic grocery item like milk and be presented with so many options like 1% milk, 2% milk, whole milk, almond milk, soy milk etc. She didn't understand 1% of what, calcium, fat, minerals or something else. So, these mega stores can be confusing for new customers and there isn't much help available to guide them through the process.

These three user needs are important to keep in mind since our design solution should ultimately cater to the user needs of time management, cost-effectiveness, and inclusivity.

Brainstorming Documentation:

Brainstorming Session 1:

Participants: Adya, Aman, Deepa, and Vinaya

Facilitated by: Deepa and Vinaya

Brainstorming I.

11th Feb 2019.

- ① Instore navigation maps.
- ② Adding more employees.
- ③ Personal shoppers
- ④ Scan and bag items
- ⑤ Visiting stores during non peak hours.
- ⑥ Language translation devices.
- ⑦ Special staff to assist foreign customers
- ⑧ Shelves that detect expired items and auto dispose them to some predetermined storage compartment.
- ⑨ You are here maps with headphones
- ⑩ Catalog machines with a database of items.
- ⑪ Store app to keep track of shopping list and reviews of each item.
- ⑫ Drones acting as personal shoppers
- ⑬ A kiosk that helps you filter through various brands of items based on quantity, type, nutrition value etc.
- ⑭ Grocery list scanning and showing cheapest price product for each item
- ⑮ Supervised play area to leave your kids while you shop.

- ⑯ Easier layout (fixed) no shuffling stores
- ⑰ Train employees to serve customers better.
- ⑱ Put up discounts and market them effectively
- ⑲ Optimize product placement accordingly.
- ⑳ Express checkout lanes increased
- ㉑ clearance items properly marketed and shelved
- ㉒ IoT enabled dispenser device for each aisle.
- ㉓ Adding catalog machines in beginning of aisle to search for items in each aisle based on name across various brands/countries
- ㉔ Relative pricing of products (food) according to their expiry dates.
- ㉕ Stocking shelves alphabetically based on product names.

Brainstorming Session 2:

Participants: Mary Muhly, Gavin Joseph
Facilitated by: Adya, Deepa

Brainstorming II:

- 1) Create more inclusive ads to encourage more people to come to the store, targeted advertising
- 2) Offer free online delivery and in-store pickup
- 3) Hire a diverse workforce
- 4) Have motorized vehicles available for people with disabilities or people with crutches
- 5) Adequate parking around the store that makes it easier to load items into my car
- 6) Having clear, easy to read, large printed labels for people with vision problems
- 7) Make sure the most commonly items are at a reachable height for people in wheelchairs
- 8) Have a mechanism that can grab items in the upper aisles rather than them calling for help as it improves accessibility and saves time
- 9) Store provides system where you can scan barcode of items you've added to cart as you go, thus avoid billing lines altogether
- 10) Store apps that let you combine different discount offers and coupons to turn up with the best deal on the best mix of items, so that you can avoid wasting time calculating your optimum deal.

Design Alternatives:

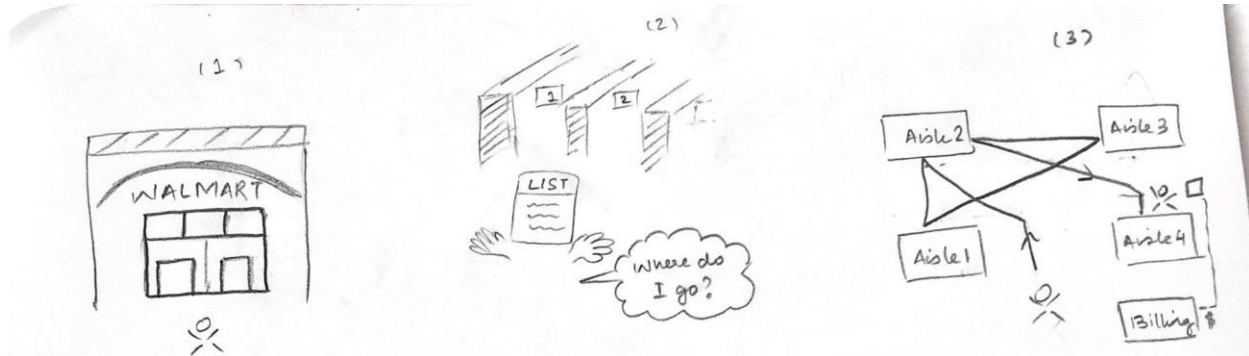
Problem Statement

Customer satisfaction while shopping in retail stores and other physical outlets has been steadily decreasing over the past years and people have started moving towards online shopping. Shoppers are having to spend too much time searching for items, analyzing calorie count, comparing prices, handling billing etc. According to the economic sales statistics of 2017, online shopping has seen a 16.2 percent increase from year to year. Yet, if given a choice 64 percent of online shoppers would prefer buying from physical outlets.

This problem exists due to multiple reasons like shoppers having kids while they shop, or families and working professionals not having too much time to shop and needing to get home as soon as possible. Students spend a lot of time trying to match prices across all nearby stores. A major bottleneck arises when they need assistance from staff members who are limited in number and are often busy tending to other customers. Inclusivity is also a factor that needs work as there isn't enough help for people from different countries who visiting these stores for the first time. Shoppers have difficulty finding the correct item and understanding the difference between items if English is not their first language. All these factors contribute to becoming a major customer turnoff and it alienates buyers from visiting the store again.

Design Alternative 1: Instore device

Shopping is not much fun when you do not have time in hand and feel rushed. This can cost the shopper both time and can also end up costing him more money. Our solution to this is an in-store tablet device which contains information about the entire store map. This tablet can help the customer navigate the store by taking the Shortest path from the entrance to billing, along the way picking up items on the customers shopping list.



Storyboard 1

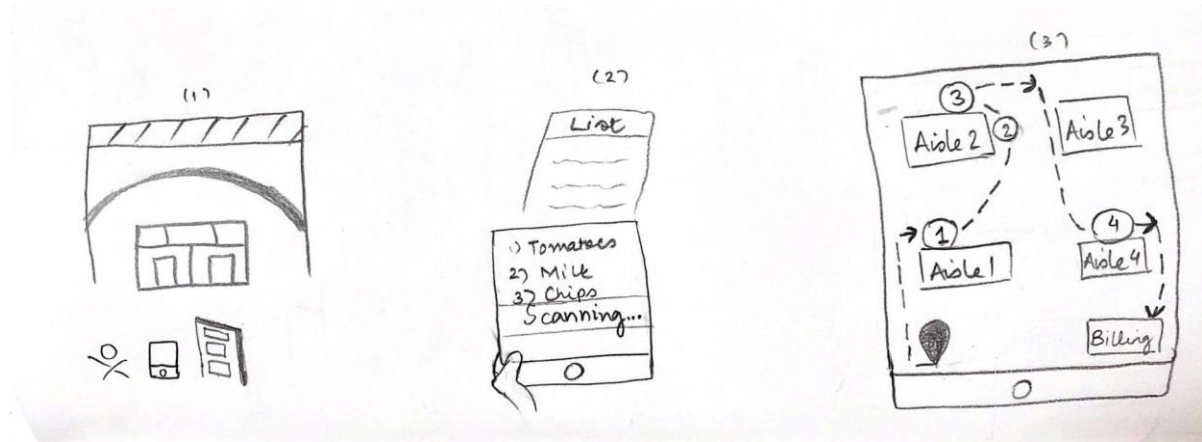
The above storyboard depicts the navigation of the customer across the store without the in-store tablet.

Figure (1) depicts the customer entering a supermarket like Walmart to do his shopping.

Figure (2) shows the customer with a shopping list in his hand. We can see him standing in front of the product aisles and he is confused which aisle to visit first. He is not well aware of the placement of products in the supermarket, so he is confused from where to start his shopping. His lack of awareness can cost him time.

Figure (3) shows the customer's navigation through the store. At first, he visits Aisle 2 followed by Aisle 1 from where he goes to Aisle 3 and from there, he visits Aisle 2 again before visiting Aisle 4 and finally ending his shopping track by going to billing.

If the stores provide tablets with store layout information, product location information and navigation then it will make shopping easy and less time-consuming for customers. On entering the store the customer can take the tablet and can enter the list of items he wants. The tablet will create an in-store navigation route for the customer. The route takes the shortest path from the customer's location in the store to billing connecting on the way all items in the shopping list given by the customer.



Storyboard 2

The above storyboard depicts the navigation of the customer across the store with the in store tablet.

Figure (1) depicts the customer entering a supermarket like Walmart to do his shopping. We can see the customer picking up the tablet at the entrance of the store.

Figure (2) shows the customer has a shopping list in his hand. He scans the shopping list so his shopping list is now available on the tablet. The customer can even enter the shopping list into the tablet if he has not prepared a physical list which can be scanned.

Figure (3) shows the customers navigation through the store, following the route shown on the tablet. The list of items entered by the customer helps the tablet to lay out a shortest route across the store. The shortest path shows Aisle 1 having item 1 of the shopping list, from there customer goes to Aisle 2 to collect items 2 and 3, then

In-store tablets can be used to digitize stores, optimize store inventory and convert store floor plan into searchable maps. From storyboard 1 figure 3 we can see that the shopper backtracks from aisle 3 to aisle 2 in search of items thus ends up losing time. This happens because the shopper is not familiar with the store layout.

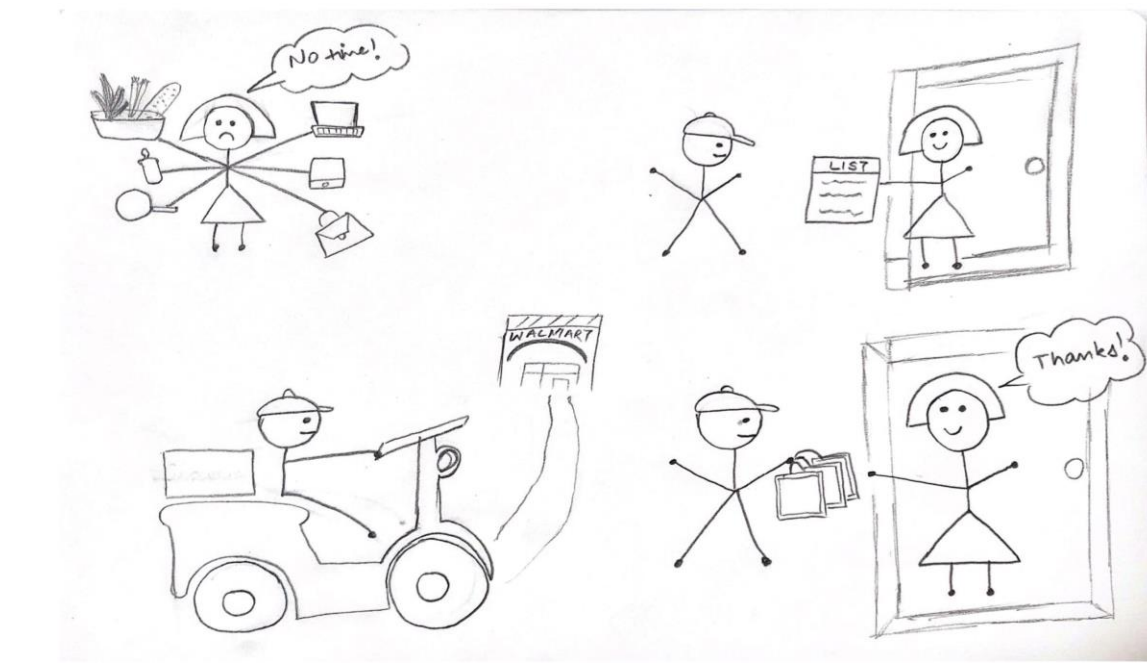
Storyboard 2 shows how this loss of time can be avoided by using the in-store device. After entering the shopping list into the device, the device then plans out a route which visits every aisle once in an efficient way. From figure 3 we can see that the shopping list has 2 items from aisle 2 which needs to be picked up. The route laid out by the device is such that it visits aisle 2 only once while picking both the items and avoids backtracking to the same aisle which was seen in storyboard 1.

By following the route laid out by the device the shopper can save time and make his shopping experience more efficient. The route information of customers can be collected by the retailers which can be used to optimize product placement based on store traffic. For example: If 50% of the shoppers come in only to buy milk then using this information the store can place the dairy section closer to the billing section making shopping more efficient for customers who come in to buy only milk. By making a soft or physical shopping list before entering the store can further save the shoppers time spent on deciding items.

The tablet can also provide information on the cost variance of the same item between different brands and all available discounts (combination of discounts) on certain items for the cost-conscious customer. Thus giving them what is guaranteed to be the best deal on the items they purchase.

Design Alternative 2: Personal Shoppers

Solution overview: Shopping could be straight up difficult for people who, either find it hard to squeeze in the time required for shopping, or for people who don't necessarily converse in the language spoken by the local people, thus might not know what certain items are called and don't know where to look for them (and such other difficulties). Our proposed solution to that is to introduce the concept of personal shoppers. Personal shoppers could add their availability, the languages that they can converse in, dialects they understand etc. to their resume and cater to people based on their skill-set. Customers can also choose the personal shopper that would be most fitting to their needs.



Storyboard 3

The above storyboard depicts a scenario where the customer does not have time to go shopping at all, and chooses to contact a personal shopper to do the shopping instead. They hand over their shopping list to the personal shopper, and while they devote their time to other activities, the personal shopper can finish their shopping and deliver the items at their doorstep.



Storyboard 4

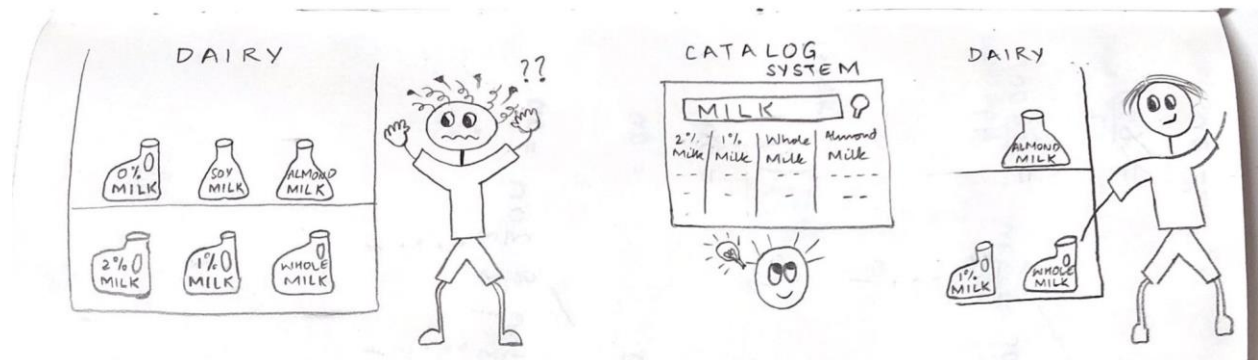
The above storyboard depicts another scenario where the customer might simply be discouraged to go shopping on their own because of a language barrier and difficulty in understanding how things work. They choose to contact a personal shopper who is familiar with their language to do the shopping instead. The customer hands over a shopping list that the personal shopper interprets appropriately, does the shopping, and delivers the required items at the customer's doorstep.

This solution can tackle some of the immediate problems that were identified in D3, such as having to fit shopping in to-do lists when you'd rather be doing something else, or when it's difficult to shop when you have young children with you who would always split your attention, or when you're new here and don't understand how supermarkets work. From D3 we understood that very rarely do people find the experience of shopping inherently enjoyable and mostly would rather dedicate their time to more important activities. Providing the option of Personal Shoppers directly addresses all these problems and then some.

This solution effectively responds to the two key user needs - time saving and inclusivity. Time saving, because it straight away removes the activity of shopping from the customers' to-do lists; and inclusivity, because personal shoppers can cater to targeted audiences and provided personalised customer service. It falls short only with cost effectiveness because it actually tends to add to the overall cost of shopping, since you need to pay the personal shopper as well.

Design Alternative 3: Catalog Systems

Solution Overview: It could be difficult to select the desired product from the stores when they have the same name or its name is insufficient to help us decide. It is usually the case when the products are differentiated by a scientific term otherwise not usually known to the users like ex: 1% 2% milk, caffeine free drinks, organic produce etc. We propose a store catalog. These are various catalog kiosks located in the store, placed in such a way that it is quickly accessible from any part of the store. The user can look up his product in this system and get all the necessary details he was unable to get earlier.



Storyboard 5

The above storyboard depicts a scenario where a person comes in to shop and is confused by the labeling on the aisles or the products. The person looks up the detailed meaning of any item by scanning them or simply typing its name in the store catalog. After getting to know the product better now, the user can make his decision easily and efficiently.



Storyboard 6

The above storyboard depicts another scenario where a user is facing difficulty in choosing the right product because the product name is insufficient or non-descriptive. The user utilizes the store catalog to look up the synonyms for the product further describing its meaning and its contents.

This solution addresses some of the major problems of user inclusivity identified in D-3. This solution does not require the user to download any app on their mobile phone. A user might know the product with a different name in his dialect or might not be able to differentiate them. The catalog will list the meaning of the scientific terms in easy to understand language and also the common names of that product in widely used languages across America. It can also list the known allergy warnings for that product and possible alternatives if any.

Our solution focuses on a key user need i.e Inclusivity. It does so by helping in-frequent shoppers, people speaking different language/dialect, shoppers who are prone to allergies, shoppers who are new to the country etc. The catalog can be multilingual and cater to the needs of all the user base described above. This solution requires a one-time investment in setting up the kiosks and developing the underlying software but it would be worth it in a country as diverse as America.

Design Choice:

After going through the interviews, observations, personas and storyboarding the design solution we have finalized is providing an in-store tablet at the stores. When customers enter the store, there will be tablets available that they can use. The application running on the tablets will give the information of the store layout, product location in aisles and navigation across the store. This will make the shopping experience easier and less time consuming for customers.

The tablet will allow shoppers to manually enter the items on their shopping list, if they shop just off the top of their head. Alternatively, they can scan their shopping list as well, if they prefer to carry a physical, written down list. The tablet will then look through the layout of the store and calculate the shortest path the customer can follow from entrance to billing, picking up all the items along the way.

This tablet can also help customers who are shopping with a cost constraint. After entering/scanning their grocery list, the customers can filter each item available from different brands by cost (from low to high). He can then opt for the lowest price option of that item. This saves the customer both time and money. They do not have to go through the hassle of manually checking the prices for the different brands available in store. In addition to this, the tablet will have an index of the current coupons available and that can be applied based on the grocery list which the customer can use while billing.

We can also use this design solution to make stores more accessible and inclusive for new customers, people with disabilities and visitors from different countries. The tablet will contain a directory of the item names and their translation in the frequently used languages. Users can type in items in their own language and see the corresponding name for the item available in-store and the aisle it is located in. People who are not tech savvy can make use of tablet through voice commands and the tablet will display a similar result. Customers can use it to get more knowledge about the difference in the items that come under one sub-category like the different types of milk (1% milk, 2% milk, whole milk, almond milk, soy milk).

We decided to go ahead with this solution since we were able to incorporate most of our solution ideas into a single device. We decided to amalgamate our third design solution with the first one. This would ensure that all our user needs are being met by one solution. In-store tablets can be used to digitize stores, optimize store inventory and convert store floor plan into searchable maps.

In-store tablets can be easily implemented by stores that have the infrastructure to do so and will serve as a useful tool for attracting all kinds of customers. It will help in boosting the in-store sales by giving shoppers some of the usability features they like about online shopping. This solution address both the time saving and inclusivity features along with providing additional features to support cost effectiveness.

Reflection:

- **How did the brainstorming session with your team differ from the one with outsiders?**
 - **Which session produced the ideas that you chose for your project?**
 - **Which method was more valuable, or did they each produce different results?**
 - **What would you do differently the next time you need to brainstorm design ideas?**

Insightful as both brainstorming sessions were, the brainstorming session within the team churned out more ideas quickly since the problem statement has been looming in the back of our minds for sometime, with even the interviewees' thoughts/ideas pushing us in certain directions. The team was bursting with ideas as soon as we started the process. On the other hand, the brainstorming session with others helped us break our block, bringing fresh and different perspectives, even though it took a little bit of time in the beginning to explain the problem statement and to let them think about it for a while before they could come up with ideas to resolve the problems. Our design alternatives mostly came from the first brainstorming session, borrowing inspiration of certain ideas from the second brainstorming session. Both sessions, thus, were equally valuable to us. And the next time we need to brainstorm design ideas we would probably do it in bursts of time, so that once the team reaches a block we spend some time apart and let the ideas flow again before we can reconvene, thus conducting multiple brainstorming sessions. Especially adding a few more sessions with the users directly, letting them be a part of the process and to let them get a sense of control over the design solutions generated.

- **How did you decide what three design ideas to storyboard?**

After the brainstorming sessions, we categorized the solutions obtained based on the problem statement. Our problem statement was mainly focused on time management and inclusivity. After categorizing the solutions we combined the solutions in each category which were closely related. This leads us to the three design ideas which we have included in our storyboarding activity. The instore device with the navigational map was the design idea obtained from the time-saving category of solutions. Personal shopper was a solution present in both the time saving and inclusivity category of solutions. Our storyboard depicts personal shoppers as a design alternative for time saving and inclusivity. Catalog system idea came from the list of solutions under inclusivity category.

- **What did you learn about your project from creating the storyboards? Do you have different ideas now about your users? Did you use your personas to think about how to create the storyboards?**

In the process of creating 6 storyboards we realized how feasible our solutions are. From 25 solutions to narrow down to 3 design alternatives and creating 2 storyboard for each

was quite a time consuming process. We had to analyse each of our solution, think about it in various ways and come up with 2 storyboards which depict the user making use of our solution to improve their shopping experience. Creating storyboards gave us a clear ideas of who are users can be and how our solution can be put to use not only the way we thought it could but also other ways. Yes , we did use our personas to think about how to create the storyboards. The design alternative personal shoppers was a result of the persona on a PSU student we created in D2.

- **How did you decide which one solution to move forward with after your storyboarding? Was it challenging to choose which design alternative you wanted to move forward with?**

After having 35 solutions at hand, we decided to categorize each each solution on whether it belonged to time management and inclusivity. The categorizing allowed us to narrow down the solution leading to the 3 design alternatives. After constructing the design alternatives we realized that an optimal solution would be to combine design alternative 1 of in store tablets and design alternative 3 of catalog items. So our final design choice was to construct a in-store tablet with features of time management and inclusivity. Categorizing the solution made it easy to decide on the design choices. After constructing the storyboards we realized we could combine the designs to make a more well-rounded solution.

- **What did you learn from this milestone? What would you do differently in the future?**

By the time we reached this milestone, we communicated more effectively and smoothly with each other as a team. We brainstormed a lot on the possible outcomes of our research and observations. There were many contradictory points among the user interviews and our own observations, however we learned later, that, it is because the user is facing the same problem in a different way. We learned to connect the dots of our research and come up with the problems which are being faced by the customers. While making the relational map in D-2, we already had a list of dislikes and problems as stated by our users during the interviews and observations. Still in the first step of D-3, it was difficult for us to condense it further and thus we needed to go back to our research and approach it from a different angle. In the process, we learned to effectively understand the key user needs for our project. We are becoming good at sketching in a way that we are now focusing more on the problem it is depicting viz. which portion of the sketch should be more detailed and vice versa.

One thing we loved were the brainstorming sessions we did. One improvement in that area could be to include a more diverse crowd, people who are outside computer science domain, outside our friend circles etc, in the discussions to help us come up with better solutions that can be applicable to more sections of the society. We would also like to talk with differently abled people so that the ideas they provide, will help us come up with design solutions, that will end up making the stores more accessible for them.