M1

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Abstract

I am choosing the task of finding the shortest path for shopping a product list in a store. Lot of time when someone goes to store with a shopping list, they end up going through different aisle searching for the product they want and end up wasting time and energy & doing things inefficiently. The idea here is to create a task where we input the list and name of the store to the interface and the interface will output me the shortest path to pick the products from the list. This assignment is to go through the design process to develop the interface for this task.

Problem space

People go to the stores for their shopping with shopping list. Goal of the shopper is to have the smooth shopping experience. Some shoppers might define their shopping goal to doing the shopping fast and smoothly. Some might not give their weightage to time, but might be interested in smoothness in completing their shopping list. The challenge people have during their shopping episodes is that sometime they are not regular to these stores or at times they are buying a product which they have not bought before hence are not sure where the product is stocked at the store. When they start shopping, they go by the order of list and lot of times they end up visiting the same aisle or sections of the store again and again because shopping list is created randomly. At times they would know where the product is stocked but at times they won't know, in which case, they might ask the store employee for the direction. Some store provides app which does have product's location address but not all stores will have that feature or you might not have the app installed. Even if you have the app installed, you would search the product location on the app in order of your shopping list and you still risk of going to same aisle/section again and again. If you are one of those who are perfectionist and organized, you have to first get all the location of the products from your shopping list, then analyze the location bay of the store

against your product locations and then try to hash out the best possible path for you to take. Even if you get all that right, you still have the risk of going to the right aisle and finding out that product is out of stock. So now, you have to also find out if product is in the stock in your store before you manually hash out the shorted shopping path.

As you can see from the explanation above, it is cumbersome process for a human to do for such a regular task. Instead an interface can be designed where user will provide the shopping list, its preferred store and interface will do all the analytics at the back end and spit out the shortest possible path for him to take, to pick the products in stock at that store.

User Types

My users would be someone who is busy and want to complete the shopping episode quickly. He could be doing quick shopping on the way to home from office, or buying a gift on the way to a birthday party or people who are on vacation and shopping for something they forgot to bring. They might be expert or novice users depending on what they are buying.

My user also could be someone who wants to have smoothness in his shopping episode even if he have ample time. Having ample time should not mean that user want to go through a bad shopping experience just to find the product. Example weekend or holiday shoppers.

My user would be someone who is visiting a particular store for the first time and he might not know the store aisle arrangement. My user would also be someone who needs to buy a product which he has never bought before and would not know its location. They will be my novice users.

All the above set of users will be interested to take part in the process as the new interface would help them in their shopping experience.

My user should be computer/smartphone user. My users will comprise of shoppers from different age group and genders as they are critical information as both might have different shopping pattern and will give different priority to shopping time.

To collect wider data, I am also randomly selecting shoppers to get an unbiased dataset.

1. Shoppers at the store: These will be random shoppers at any given store and they could be either expert or novice. These users will be definitely interested in my project as this would benefit them immensely.
2. Handyman/Professionals: They will be my expert users and I think they will also benefit from my interface as they do not window shop while they are in the store. They want to complete the shopping as fast as they could. However, it will be difficult to recruit one willing candidate and also to fact that they might order online and pick up at the store.
3. Fellow Classmates in CS6750: Every one shops at the store and I will be taking help from few of my class mates for filling out survey for me. It would interest them for 2 reasons, first I am sure the interface will help them improve their shopping experience if it is implemented and two, they would get some compensation in terms of participation credits for this term.
4. Friends and Family: I will be recruiting few of my friends & family. I will be select both working and non-working shoppers from this pool. Since I am avoiding the social desirability bias, it is ok to include this population group and yes they will be interested to contribute because they would want to help me complete my school task.

Needfinding Plan 1

Naturalistic observation

I plan to do following for this plan

1. **What Will I Observe**: I will observe the space and environment shoppers are doing these tasks & observe how they do shopping inside a store and take notes of their activities & behavior in this context. I will be observer if they use smart phone in any way to help them in shopping process? I will observe how different user groups do their shopping, helping me to interpret later who my actual users will be. I will also observe what other task are they doing while shopping? Talking on phone? Eating or drinking while shopping. I will also

observe what kind of information (store map) do they use? I will also observe how soon shoppers go for help? At the entrance? , in the aisle? How is their overall mood while shopping

2. **Where Will I Observe**: I will observe shoppers in multiple stores like Home improvement store(Home Depot or Loves) , grocery store (Harris Teeter) & departmental stores(Walmart or Target)
3. **When Will I Observe** : I will note these observation during following times
    a. Weekends : When there will be lot of rush
    b. Weekdays Afternoon : when there is low traffic in the store
    c. Weekdays Morning: during morning time when shoppers are in rush to go to office and they forgot to buy something needed in office.
    d. Weekdays Evening: during evening when shoppers are tired and want to buy something quick before they head home.
    e. Closing Hours : during the closing hours of the day when shoppers would be advised to complete their shopping quickly
4. **What data I will Collect** : I will collect following data
    a. How often shoppers repeat the aisle/zone during their shopping episode?
    b. How often they ask store employee for their help? Where do they ask help? Just when they enter the store? Or at the aisle?
    c. Do they attempt to find on their own before asking for help?
    d. Time taken to complete a shopping episode
    e. Guess if the shopper is Handyman or general shopper
    f. Do they window shop during this shopping episode?
    g. Approximate the age group of the shopper
    h. Categorize the gender of the shopper
    i. Do they use smartphone in any way for shopping?
5. **Take a Partner** : Will take a partner along and ask him to take notes for the above mentions scenario and later compare our notes

Biases:

1. **Confirmation bias**: I think I might be biased in observing the shoppers as I might be observing what I already have in mind. Like if the shopper talks with store employee I might assume that he is asking for direction instead he might be asking advice.

I am avoiding this by taking a partner & asking him to observe too and compare his finding with mine to remove any biases. I will also look for signs at multiple times that I might be wrong, like if I assume the shopper is in hurry and then shopper goes to a café in the store to have a snacks, he might not be in hurry. Also, all my observation at the store would be based on actual observation and interpretation than theoretical knowledge on that matter.

Needfinding Plan 2

Participant observation

I plan do following for this Needfinding plan

1. **What will I do**: I will make 2 shopping lists and go through the steps of shopping at different locations? I will try to become a user and experience the challenge that we have while executing those tasks.
   I will maintain a logs of events, maintain diaries, takes notes of my observations. I will observe the sequence of my task. I will also try to have informal conversation with secondary users like store employee. I will try to observe the overall environment I would be operating on. How different stores brings different challenges for me.

2. **What Steps**: I will make a 2 lists, one of the items I generally would know and other of the items that I am buying for the first time, go to the different stores, try getting the store map, try finding the item based on my cognitive ability and using the store map, try for few minutes, then ask a store employee for direction, follow his direction and see if I can locate it or if I would still one more final direction. I would also try to do things in different context like talking on phone or listening to music.
   Then repeat the whole steps with 2nd shopping list which contains the regular products you normally shop. Try to note your challenges and observations. Try shopping your regular products from a store where you normally do not shop. Say instead of Walmart, if you go to Publix for your grocery.
3. **What data I will gather**: I will be collecting different types of data, like time data (How long does it take to find all products from the list), Frequency data (How many time did I ask for help), demographic

information of the shoppers, what other activities are they doing while shopping? Their priority while shopping? Is it time or leisure? How is their current shopping experience? How proactive store is in helping the shoppers find their product's location. Do they have any tools to help them?

Biases:

Confirmation biases: Because I have this preconceived notion about the problem and how it should be solved, I might be doing things in a specific way. I might not try honestly to find the product in the store and quickly jump to conclusion that I need help from store employee.

I will try to avoid this bias by trying to avoid doing thing with preconceived notion and do things as I would do before I had this idea. I will also try to find signs where it would make it obvious that I am doing it with a bias.

Needfinding Plan 3

Surveys:

Goal of my survey will be to find out what time of the day do they generally shop? , Do they ask help to get to the product location? , how big is their shopping list? , Do they do any other activity (eating or playing games)? How long does it take for them to shop? Do they look for alternatives for the products in the shopping list? Do they have difficulty finding the products in the store without help? What is their age group? Gender? Do they use smart phone in shopping process? I am trying to find out different context and what is the priority for the user. I will try to collect both quantitative and qualitative data from this exercise.

I will try to get my survey questions tested out with either class mates or friends. I have also tried to make the survey very simple and short. I have kept few questions where user has options to express himself (Q1, Q2, & Q8).

I would conduct a survey with broad group of shoppers and following are some of the questions I would ask them

1. During your most recent shopping episode, when did you shop at these stores

   □ Weekends □Weekdays □coming from office □holidays □Weekdays other…. Please mention

2. During your most recent shopping episode, How did you find out if the product was available at the store before going

   □ Website □ MobileApp □ Calling store □ Do not check other …..Please mention

3. During your most recent shopping episode, how many products were in in your shopping list?

   ○ 1-5 ○ 6-10 ○ 11-15 ○ 16-20 ○ 21+

4. During your most recent shopping episode, how long (in minutes) did it take you to complete the shopping episode?

   □ 1-30 □ 31-60 □ 61-90 □ 91-120 □ 121+

5. During your most recent shopping episode, how many times did you ask help for direction at the stores

   ○ Never ○ 1 ○2 ○3 ○4 +

6. During your most recent shopping episode, on a scale of 1 to 5, How easy was for you to quickly find the product and exit the store, 1 being least important and 5 being very important

   ○ 1(Very easy) ○ 2(easy) ○ 3 (neutral) ○4(hard) ○ 5 (Very hard)

7. During your most recent shopping episode, how long (in minutes) have you window shopped at the stores while shopping

   □ None □ 1-10 □ 11-20 □ 21-30 min □ 31 +

8. During your most recent shopping episode, What else have you done while you are at the store

   □ Eat □ try samples □ play video games □ listen to music □ others….please specify

9. During your most recent shopping episode, how many alternatives did you find for the products in your shopping list

   ○ Never ○ 1 ○ 2 ○ 3 ○4 ○ 5+

10. Would you be interested in trying a app which will help you find the shortest path to shop your shopping list

    ○ Yes ○ No ○ May be

Survey will be sent to following user groups and will try to cover different categories based on age, gender & working status and shopping behavior.

a. General user: I will be sending surveys to group of people in my neighborhood, office and randomly choosing people at the store to answer my surveys. They can be expert or novice shoppers.
b. Classmates at CS6750: I will be sending survey to my class too, I will attempt to be anonymous if that's is possible.
c. Friends & Family : This is another group I will be sending surveys
d. Handyman/Professional : I will try to use few handyman if they can take my surveys

Biases and step I have taken to avoid them

1. Provide option to user to enter when their answer is not one of the options we have provided. Example Survey Question 5 and 6
2. Avoiding asking loaded question: I have phrased my questions to avoid any loaded questions. For example : Survey question 4, instead of asking how much time do you waste locating the items from your list, I have asked how long does it take you to pick all the items
3. Social desirability bias: I will hide questions where it is referencing me rather all of them are formulated to give me an objective answers. Instead of asking would you like to test **my** design/interface? I have asked would you be interested in trying an app. (survey question 10)
4. Observer bias : I will be having someone review my survey to make sure I do not have any leading questions in my survey
5. Recall Bias: I will have people answer my survey while they are exiting a store & I will be asking them questions referencing their recent shopping episode.
6. Instead of asking do they own smart phone? I will ask them how much they use phone in shopping process.

References

1. Prof Joyner Video at Udacity
   https://classroom.udacity.com/courses/ud400
2. https://www.youtube.com/watch?v=mVHoUkQSIkU

Appendices

1. Appendix A: Needfinding plan 1

i. Observe if shoppers are in hurry to shop or are they relax and taking their own sweet time to shop
ii. Are they talking on phone with family members to confirm if the product is right? Are they taking photo and sending them to confirm? Are they video chatting to show them different products on aisle?
iii. Are they eating and spending time at the sampling kiosk, like one they offer at Costco.
iv. How many times the user is asking for help for direction?
v. Note the different user categories based on Age, Gender and profession
vi. Note by the dress they are wearing, if the shoppers have come directly from office.