In-Store Shopping Experience

Members:

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Contribution Summary:

- **Adya-** Prototyping, Pictures & Description of Prototype, Evaluation, Reflection
- **Aman -** Prototyping, Pictures & Description of Prototype, Evaluation, Reflection
- **Deepa -** Prototyping, Pictures & Description of Prototype, Evaluation, Reflection
- **Vinaya -** Prototyping, Pictures & Description of Prototype, Evaluation, Reflection
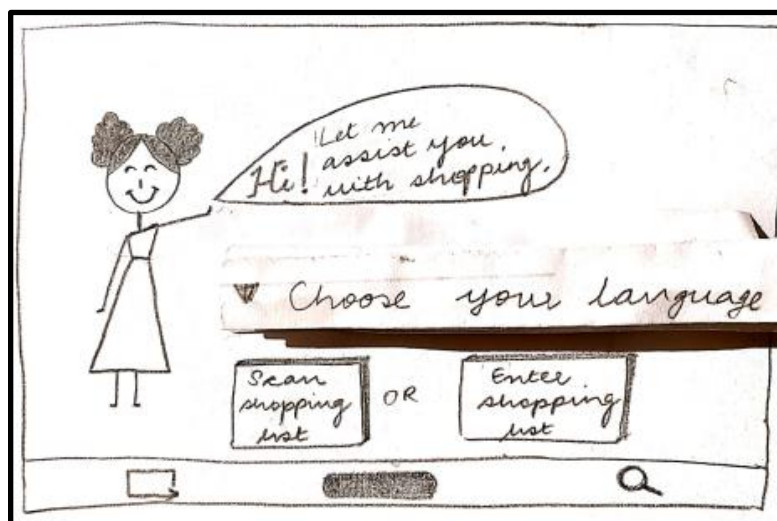
1. **Pictures & Description of your prototype:**

Prototype Tool: We choose to make paper prototypes to carry out our evaluations. Reason being that, it was easier for us to translate our ideas onto paper, discuss each design choice and edit as required (in multiple iterations). After having created the storyboards previously (and having done sketching assignments in class), paper prototyping came easily to us.
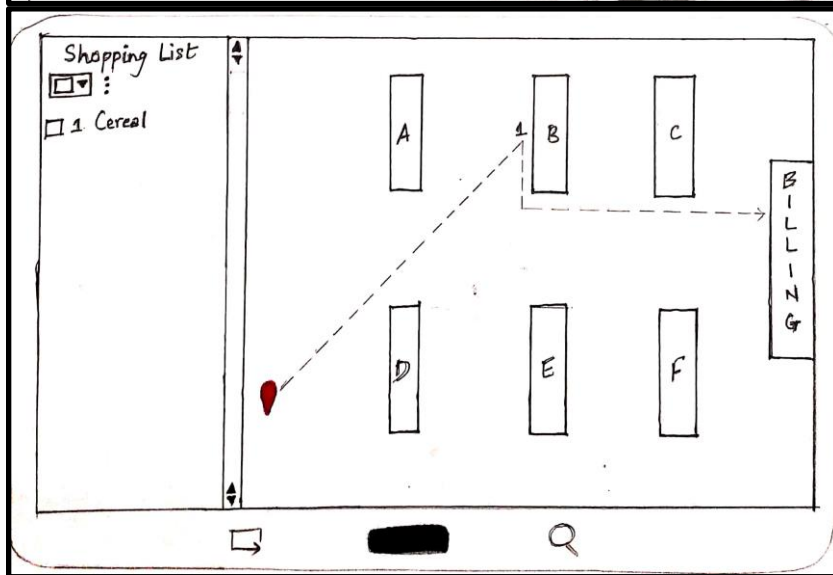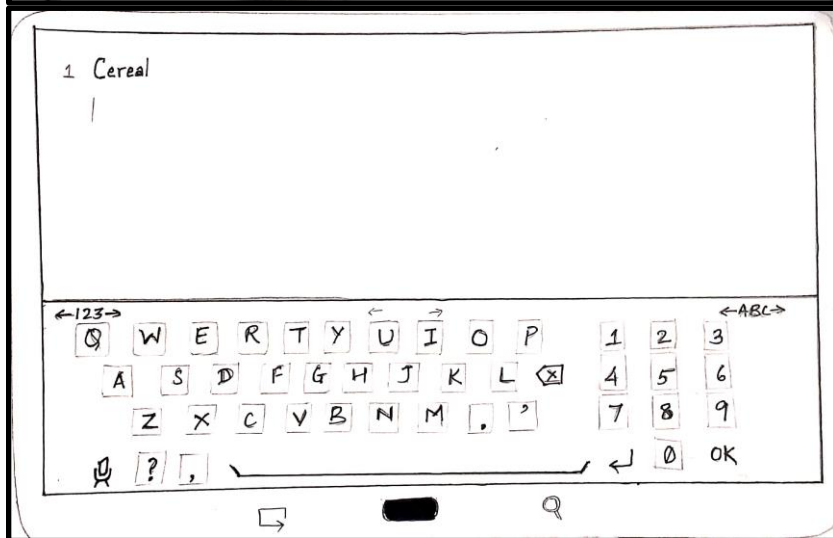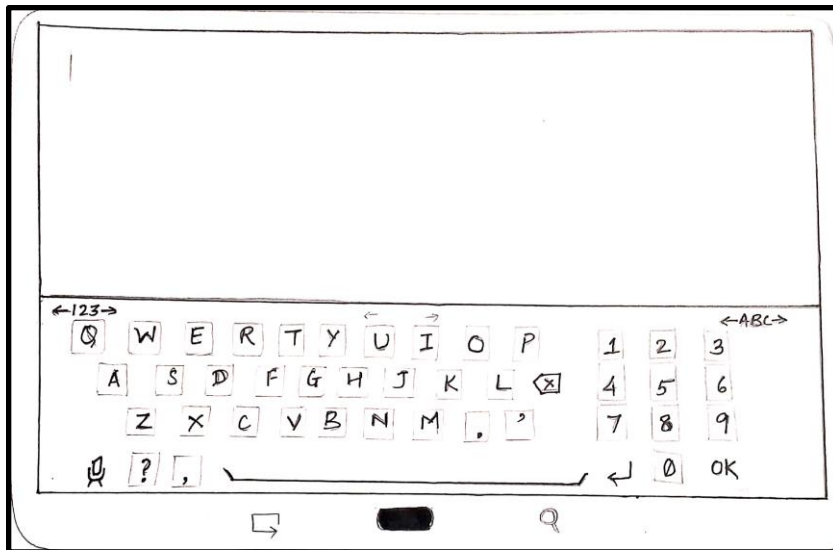
Prototype Features: Our paper prototypes allowed us to test the following 3 use cases:
- ***Using the tablet for navigating to an item in the store***:
  This feature allows the user to locate even just one item at the store and provides navigational directions towards it after calculating the shortest path to it. In a long list of shopping items, the algorithm arranges the items on the list in such a way that it projects the shortest path from the entrance to each item to billing. Thus saving time by eliminating the need to backtrack to aisles and searching for the location of items. This tackles one of the primary goals of this project, to save time by streamlining the process of shopping.

  To find the location of just one item, the user could click on either "scan shopping list" or "enter shopping list". The second option lets them type in the item that they're looking for. Pressing OK would take them to a map showing directions from their location to the item. As the user reaches the item, the tab would sense this and cross off Cereal from the list. When the user reaches the billing, it assumes that the shopping is done and moves to the final page. The user need not manually log out of the system and leave any sensitive details behind, thus providing a forgiving interface

Screen 1 (keyboard):

←123→   ←ABC→
Q W E R T Y U I O P   1 2 3
A S D F G H J K L ⌫   4 5 6
Z X C V B N M , '   7 8 9
🎤 ? , _____ ↵ 0 OK

Screen 2 (keyboard with text):

1 Cereal

←123→   ←ABC→
Q W E R T Y U I O P   1 2 3
A S D F G H J K L ⌫   4 5 6
Z X C V B N M , '   7 8 9
🎤 ? , _____ ↵ 0 OK

Screen 3:

Shopping List
□▼ :
□ 1 Cereal

A   B   C
                    BILLING
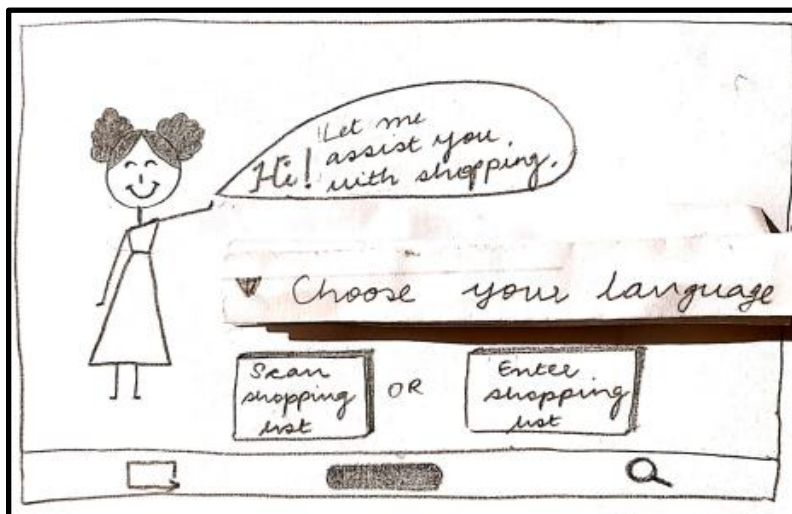D   E   F

- ***Using the tablet to display the lowest price of an item available across different brands:*** The user will be asked how he would go about using the tab to know the lowest cost of an item across various brands in the store. The user starts with the home screen. On pressing the search button on the tablet, the user will be directed to the search screen and will be

provided with the keyboard to enter the name of the item he wants to search. The user is then directed to the screen containing the item he was searching for and the item with the lowest cost will be highlighted in that screen.
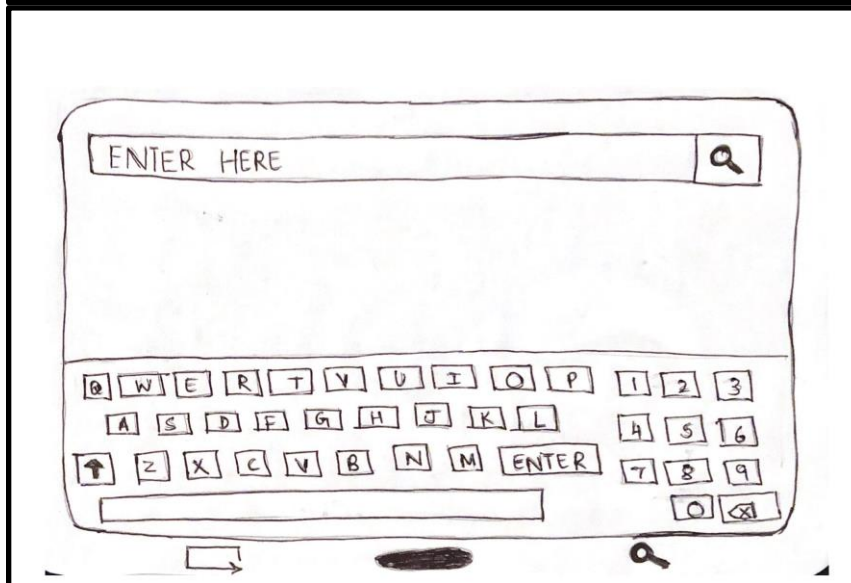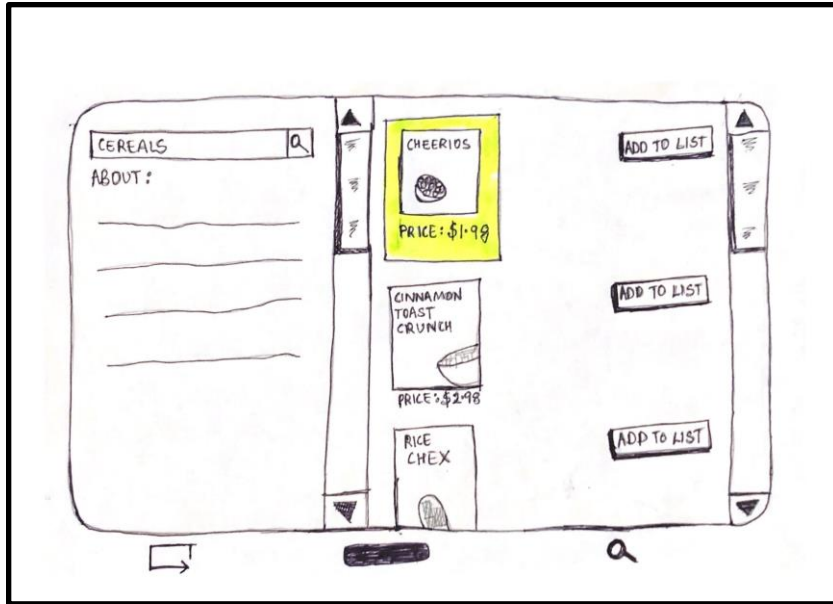
- ***Using the tablet to search for an item in a different language:*** This feature allows the user to search for items in his native language/dialect. This would implement the inclusivity feature and make it easier for foreign users to find items with the store. After looking up items in the search bar, it will inform the user if the item is available in store, under what name it can be found and will give him the option to add it to his current shopping list.
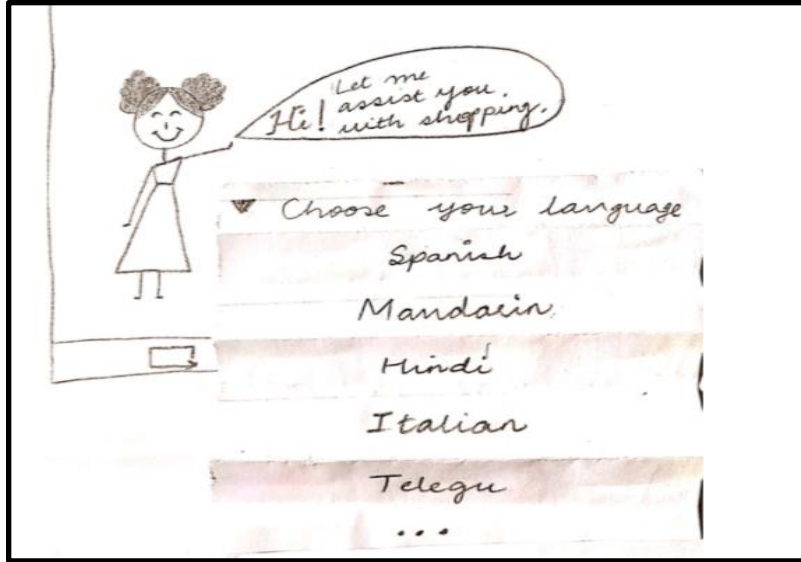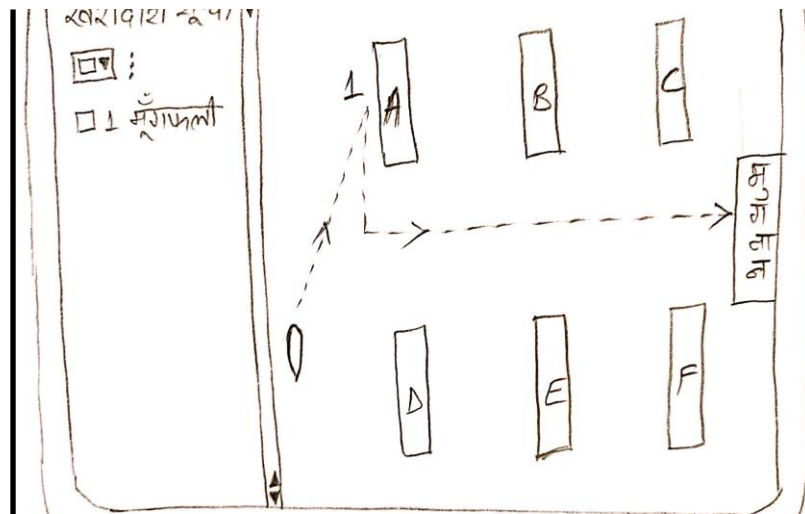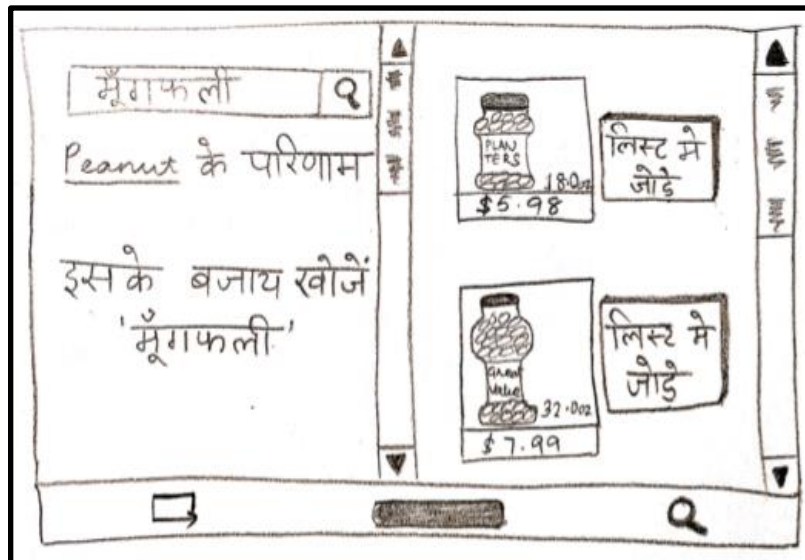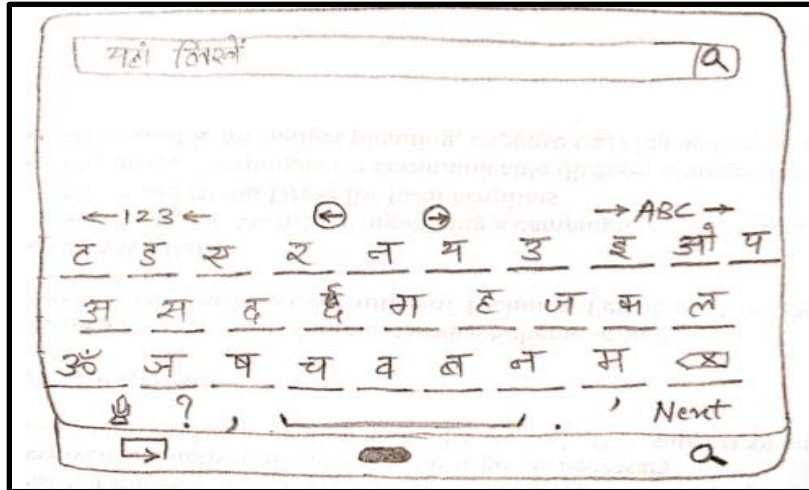
2. Evaluation Summary & Next steps:

- ○ **What evaluations did you conduct?**
  We conducted two cognitive walkthrough and two think aloud evaluations.
    1. Using the tablet for navigating to an item in the store: two cognitive walkthrough evaluations
    2. Using the tablet to display the lowest price of an item available across different brands: think aloud evaluation
    3. Using the tablet to search for an item in a different language: think aloud evaluation.

- ○ **What were the key problems that you identified?**
    1. When searching for the lowest cost of an item, the user had two buttons with the same functionality (Search button and enter button) that might be confusing to the user

2. In navigating, if the user only needs to find the location of one item, the home page screen buttons "scan shopping list" and "enter shopping list" do not communicate their affordance of being able to provide the location for just one item also.
3. After having entered the shopping list manually, the user might take time to locate the item on the screen that affords the finishing of this act (OK button) in order to achieve the required result (produce navigational map).
4. The user might not understand the meaning of the choose language option text if he does not know English at all.

- **If you had more time to work on this project:**
  - **What would you change in response to feedback?** Most of the feedback was given about the interface of the buttons on various screens. In some cases, the various functionalities provided by the buttons wasn't exactly clear. So in response to the feedback, we would revisit each button and mostly change their interface to communicate each button's functionality more clearly.
  - **What would you not change about your design?** We would not change the interactive nature of the cartoon on the home page and last page, because it immediately draws in the customer and makes it a friendly interaction. Since much of the design of each screen relies on the intuition of the customer using it, such as items get crossed-off once you reach them, the immediate switch to the final page when the customer reaches the billing, highlighting the items which are of the least cost in their category etc. it creates an almost conversational interaction between the system and the customer, making the experience wholesome. We drew inspiration from the article about Affordances when designing these aspects of our project, and they paid off.
  - **Would you want to conduct more evaluations before iterating the design or are you ready to change things now?** We would like to conduct more think aloud evaluation with the users before changing the design. Conducting multiple would help us get a better picture of all the affordances incorporated in our design.With more evaluation, we can start changing the design flaws that were more commonly encountered before working on other flaws.

3. Reflection:

- Reflection on the experience of prototyping

- **What worked well?**
  Making paper prototypes proved to be very useful in testing the affordances of some of the aspects of our design. When we started out with the prototyping process, all of us had many ideas on the placement of interactive buttons on the screen, transitions between different screens, functionality to be included in the prototype. Bearing in mind what we have learnt from Fitt's law, the counter-argument to that law, affordances, and the videos about paper prototyping, there were those design decisions that we quickly agreed upon too, such as the size of the buttons and their placements, the drop-down menu, the interactive appearance of the home page etc. Paper prototyping allowed us to incorporate all our ideas easily into the prototype, making modification wherever required. We were able to easily remove things which did not seems right.

- **What did not work well?**
  There were not any such major roadblocks which we can mention. We were clear on our designs and implemented with ease. We were confused a little on the initial designs but were quickly able to sort it out by discussing within ourselves. The articles were well documented and descriptive enough to help us learn about the paper prototyping process.

Reflection on the evaluation process
- **At a high level, what kind of problems did each evaluation surface? Were they similar or different? Why do you think that is?**
  It took a while before we got a hang of the evaluation processes and understand how to proceed with it. We also had to decide on what use cases should fall under what categories of evaluation. At a high level, most of the problems that surfaced from all the evaluations were to do with how clearly the intent of the interactive parts of the screen such as the buttons and the drop-down list was made known to the user. This was mostly because of what we ourselves were used to while using regular technologies and the corner cases that we didn't think about during prototyping, but which came to light during evaluation.

- **Which evaluation was most helpful (or were they all equally helpful)? Why?**
  Both Cognitive walkthrough and think aloud evaluation were equally helpful. Doing think aloud evaluations gave us an opportunity to test our prototype with a prospective user. It gave us an understanding of what were the good aspects of our design and what were the difficulties or confusion the user would face while using the product. As for Cognitive walkthrough, it gave us an opportunity to look at our prototype from a different perspective as compared to when we were prototyping. Since we had to come from a standpoint of unbiased critique, we could look at the tiny flaws in the design that had not occurred to us during prototyping.

- **What would you do differently next time regarding both prototyping and evaluation?**

Regarding Prototyping: As elaborated earlier we chose to do paper prototyping because it helped us include or remove all our ideas into the prototype as and when required. Next time, if time allows, we would like to increase the number of iterations where we share our rough sketches with each other, reconvening and perfecting our idea of what the prototype should be before it is built, and use a wireframing tool to do so.

Regarding Evaluation: The evaluations we conducted were fruitful in letting us know the flaws in our design. They let us know the user's perspective, as well as shifted our own perspective with which we viewed the design. As such we wouldn't change the current evaluation process. Instead, we would probably include the five arguments presented in the article "When the Implication Is Not to Design (Technology)." by Baumer, Eric PS, and M Six Silberman, condensed and narrowed to fit the realm of our class project, since it's only the first prototype and changes are affordable.

- **Did you learn anything from this exercise? If so, what? If not, why not?**

We learnt that making a design is not the end of the road but a road itself which still had to be traveled upon. What we mean to say is that it is very important to include the user even after making the design and we should keep taking his opinion on the matter. It might so happen the design is not so accessible to user as we originally intended to be. We also learnt the processes and features of different types of evaluations, what aspects they highlight and how do they do it.

6. Appendix:

Self Reflective Evaluation:

Cognitive Walkthrough Report (CWR) 1

CWR Number: 1
Product Name: In-Store Tab
Task Name: Navigation directions to find 1 item
Date and Time of Study: 3/9/2019 8:00PM-9:00PM
Experimenters' Name: Deepa

Task Description:

 I want the navigation directions the location of cereal at the store.

Task Action Sequence:

1. *User: Press   the   home   button   to   switch   on   the   tab*
   System: Screen lights up with the home page, and the search button lights up
2. *User: Press   the   "Enter   Shopping   List"   button*
   System: Screen changes to an empty page with a cursor ready to type, and the on-screen keyboard comes up
3. *User: Type   in   "cereal"*
   System: Each letter appears on the screen as the button for it is pressed.

4. *User: Press "OK"*
   System: Screen changes to a navigation map with the shopping list on the left pane, with item cereal in it. Map shows directions from the current location of the user to the aisle B where cereal is kept, and then to billing.
5. *User: Move to the location indicated (in aisle B)*
   Phone: The location of the user changes to his/her current location at aisle B
6. *User: Move to Billing*
   System: Screen changes to final screen saying "Thank you, visit us again!"

Interface/tool/system description:

The tab has a touch-screen and standard size, and is located in the shopping cart. It has a center button that can be physically pushed. There are headphones and microphones plugged in next to the system to allow for Voice Input.

Cognitive Walkthrough (Spencer et al, 2000):

1. User: Press the home button to switch on the tab
System: Screen lights up with the home page, and the search button lights up

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		
General Note: Since it is the only button available on the screen it would be the first action any user would try intuitively, and from learned experience		

2. User: Press the "Enter Shopping List" button

System: Screen changes to an empty page with a cursor ready to type, and the on-screen keyboard comes up

CW Question	Issue?	Notes
Will the user know what to do at this step?	x	The user might not immediately guess from the term used "enter shopping list" that it can help them locate even just one item. They might instinctively use the search button instead.
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

3. User: Type in "cereal"
System: Each letter appears on the screen as the button for it is pressed.

CW Question	Issue?	Notes
Will the user know what to do at this step?		

CW Question	Issue?	Notes
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

4. User: Press "OK"
System: Screen changes to a navigation map with the shopping list on the left pane, with item cereal in it. Map shows directions from the current location of the user to the aisle B where cereal is kept, and then to billing.

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?	X	The user might not immediately spot the OK button that completes the action

5. User: Move to the location indicated (in aisle B)
Phone: The location of the user changes to his/her current location at aisle B

CW Question	Issue?	Notes
Will the user know what to do at this step?		

CW Question	Issue?	Notes
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

6. User: Move to Billing
System: Screen changes to final screen saying "Thank you, visit again!"

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

Potential fixes for discovered problems:

In this example, the 2 problems were with the interactive nature of the tab.

1. In the case of the first act of trying to find the location of 1 item the user might not realise that "enter shopping list" and even "scan shopping list" buttons both achieve the required result, and might try to achieve the required result using the search button that does not provide this functionality

Suggestions:
1. The screen could provide written information that describes functionality of the two buttons, that is, that they provide navigation with a map et al.
2. The buttons themselves could provide visual clues as to their affordances.

Tradeoffs: The second solution is better because it engages the user visually, allowing his to use his/her instincts.

2. In the case of entering the shopping list manually, the user might take time to a) spot the OK button and b) recognise that the finishes the act.
Suggestions: Make the button green so that pops out and instinctively (because of the connotation of a green button) tells the user that this might be the right button to press in order to move ahead.

Cognitive Walkthrough Report 2:

CWR Number: 2
Product Name: In-Store Tab
Task Name: Navigation directions to find an item when the user does not know its correct English term

Task Description:

I want the navigation directions for the location of "Moongfali" at the store.

Task Action Sequence:

1. *User: Press the home button to switch on the tab*
   System: Screen lights up with the home page, and the search button lights up
2. *User: Press the "Choose Your Language" button*
   System: The same screen displays a list of most commonly spoken languages in the US
3. *User: Press on "Hindi" as the language of choice*
   System The same screen displays all the functionalities but this time in Hindi language
4. *User: Press the "Suchi Banaye" (English Translation: Enter shopping list) button*
   System: Screen changes to an empty page with a cursor ready to type, and the on-screen keyboard comes up in the chosen language dialect keys
5. *User: Type in "Moongfali" (English translation: Peanuts)*
   System: Each letter appears on the screen as the button for it is pressed.
6. *User: Press "Kare" (English translation: Okay)*
   System: Screen changes to a navigation map with the "Kharidari Suchi" (shopping list) on the left pane, with item "Moongfali" (peanuts) in it. Map shows directions from the current location of the user to the aisle A where peanuts is kept, and then to billing. Everything is displayed in Hindi.
7. *User: Move to the location indicated (in aisle A)*
   Phone: The location of the user changes to his/her current location at aisle A
8. *User: Move to "Bhugtan" (English Translation: Billing)*
   System: Screen changes to final screen saying "Dhanyawaad, Fir Padhare!" (English translation: Thank you, visit us again!)

Interface/tool/system description:

The standard size tab has a touch-screen and is in the shopping cart. It has a center button that can be physically pushed. There are headphones and microphones plugged in next to the system to allow for Voice Input.

1. User: Press the home button to switch on the tab

System: Screen lights up with the home page, and the search button lights up

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		
General Note: Since it is the only button available on the screen it would be the first action any user would try intuitively, and from learned experience		

2. User: Press the "Choose Your Language" button

System: The same screen displays a list of most commonly spoken languages in the US

CW Question	Issue?	Notes
Will the user know what to do at this step?	x	The user might not understand the meaning of this text if he does not know English at all
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

3. User: Press on "Hindi" as the language of choice

System: The same screen displays with all the same functionalities but this time in the Hindi language

CW Question	Issue?	Notes
Will the user know what to do at this step?	x	The user might not understand the meaning of this text if he does not know English at all

CW Question	Issue?	Notes
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

4. User: Press the "Kharidari Suchi" (English Translation: Enter shopping list) button

System: Screen changes to an empty page with a cursor ready to type, and the on-screen keyboard comes up in the chosen language dialect keys

CW Question	Issue?	Notes
Will the user know what to do at this step?	x	The user might not immediately guess from the term used "Kharidari Suchi" that it can help them locate even just one item. They might instinctively use the search button instead.
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

5. User: User: Type in "Moongfali" (English translation: Peanuts)

System: Each letter appears on the screen as the button for it is pressed.

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

6. User: Press "Kare" (English translation: Okay)

System: Screen changes to a navigation map with the shopping list on the left pane, with item peanuts in it. Map shows directions from the current location of the user to the aisle A where peanuts is kept, and then to billing. Everything is displayed in Hindi.

CW Question	Issue?	Notes
Will the user know what to do at this step?		

CW Question	Issue?	Notes
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?	X	The user might not immediately spot the "Kare" button that completes the action

7. User: Move to the location indicated (in aisle A)

Phone: The location of the user changes to his/her current location at aisle A

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

8. User: Move to Billing

System: Screen changes to final screen saying "Dhanyawaad, Fir Padhare!" (English translation: Thank you, visit again)

CW Question	Issue?	Notes
Will the user know what to do at this step?		
If the user does the right thing, will they know that they did the right thing and that they are making progress towards their goal?		

Potential fixes for discovered problems:

In this example, the 3 problems were with the interactive nature of the tab.

1.In the first case of the user trying to use the "Choose the Language" option, a user might find it difficult to use this option if he is not familiar with the English language and thus might have to make an educated guess.

   Suggestions*:*

1. *The option could provide a visual aid like a globe icon or may be a flag of the country where that language is frequently spoken, something which is familiar to the user and doesn't include text. This would be a good option with no compromises to the current functionality.*

2.In the second case of the first act of trying to find the location of 1 item the user might not realize that "enter shopping list" and even "scan shopping list" buttons both achieve the required result, and might try to achieve the required result using the search button that does not provide this functionality

Suggestions:

1.The screen could provide written information that describes functionality of the two buttons, that is, that they provide navigation with a map et al.

2.The buttons themselves could provide visual clues as to their affordances.

Tradeoffs: *The second solution is better because it engages the user visually, allowing his to use his/her instincts.*

3.In the case of entering the shopping list manually, the user might take time to a) spot the OK button and b) recognise that the finishes the act.

Suggestions: Make the button green that makes it pop out and instinctively (because of the connotation of a green button) tells the user that this might be the right button to press in order to move ahead.

II Think Aloud

1. Think Aloud UAR Form:

UAR Number:
10
Product Name: *In-store tablet*
Date and Time of Study: *3/9/2019 8:00PM-9:00PM*

Experimenters' Names:
Vinaya D Bhat

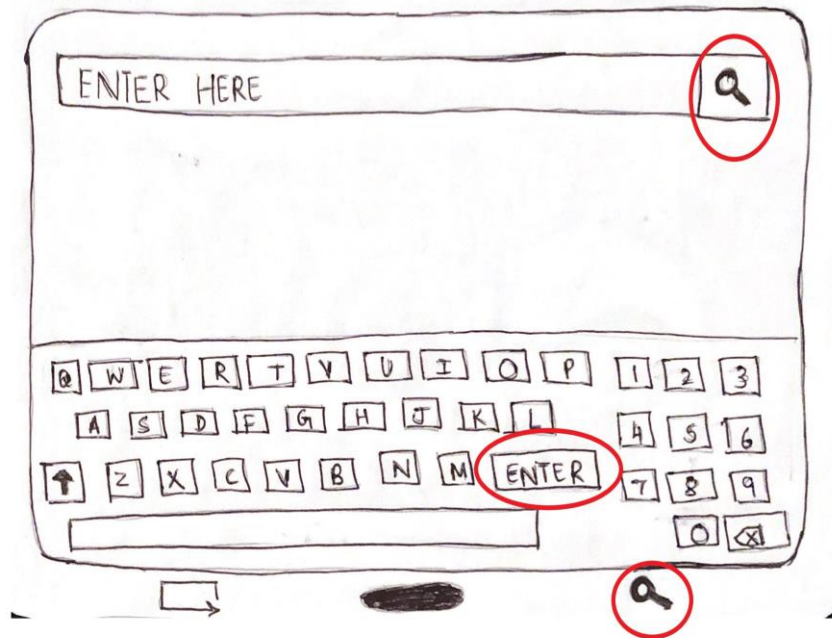**Subject ID:**
10

Subject Details:
Age: 27 years
The subject is a student.
The subject has student loan and prefers shopping for items in a cost-effective way.

Heuristic List:

There are 2 buttons with the same symbol (one interactive and one hardware) and also there is a enter key (on the keyboard) in the search screen.

Explanation:

The user was confused which button to choose after entering the name of the item he wants to search for. Multiple buttons on the screen serve the same functionality. The interactive button on screen and the hardware button appear the same. Pressing the hardware search button will not cause any change since the user is already in the search screen. So, the user must figure out to press one of the interactive buttons on the screen.

Severity or Benefit:
Rating: 2
Justification (Frequency, Impact, Persistence, Weights):
Frequency: Common. This search button confusion can occur to many new users.
Impact: It is easy for the user to overcome. The user can select one of the interactive buttons on the screen.
Persistence: It is a one-time problem. Once the user gets to know which button, he will continue using that button.
Weights:
I think a rating of 2 will be apt for this issue since it is common issue which can be easily overcome. Once the user gets to know which button works, he will continue using that button.

Possible solution and/or Trade-offs:
A possible solution would be to remove the interactive search button from the screen and change the name of the ENTER button on keyboard to SEARCH button since after typing the name of the item it would be easy for the user to use the SEARCH button on the keyboard.

Relationships: The confusion between the interactive and hardware search button is mentioned here because this case is more closely related to searching for an item using these buttons.

III Think Aloud

Usability Aspect Report (UAR)

UAR Number: 2	
Product Name: In-store tablet	
Date and Time of Study: 3/13/2019 8:00PM-9:00PM	
Experimenters' Names: Adya Pandey	
Subject ID: 1	
Subject Details: **Age**: 23 years The subject is an international student. The subject has specific shopping preferences and prefers shopping for items himself.	
Heuristic List:	

No. UE1	Problem/Good Aspect Problem

Name:
Problem with the selecting preferred language

Evidence:

It is difficult to see the button 'Choose your language' as there are no visual cues supporting it.

Explanation:

The written text in itself is ambiguous and causes confusion in the minds of users whose primary language is not English. The user is not sure where to start the application first, whether to choose the language first or choose one of the two below options related to shopping. Linearity is missing in the design as it gives the user too many options and no clues about their functionality.

Severity or Benefit:
Rating: 2
Justification (Frequency, Impact, Persistence, Weights):
Frequency: Common. The dropdown option to change language is not standing as a major help for inclusivity.
Impact: It is not easy for the first-time users. If the user has no experience in English, he might have to an educated guess.
Persistence: It is a one-time problem. Once the user gets to know about the feature, he will continue it whenever needed.
 Weights:
I think a rating of 2 will be apt for this issue since it is common issue which can be easily overcome. It will be easy for the user once he knows about the feature.

Possible solution and/or Trade-offs:
A possible solution would be to add visual cues in the button like flags for the country where that language is spoken. This will automatically indicate to the user that he can go and choose his own country's language. For solving the linearity issue, the first page can split into two. The first screen just gives the user the option to choose the language, while the second will implement the grocery list functionality.

Relationships: