PROCESS BOOK

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Interaction Design Studio 1
Assignment 3: Conversational User Interface
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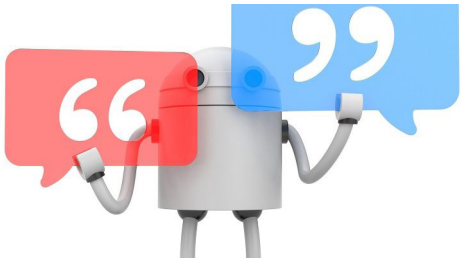
OVERVIEW



Conversational User Interface

In this project, we designed a conversational user interface for meal ordering for a group of people, and can support various scenarios such as home parties, company meetings, field trips, etc.

The name of our CUI product is “Kara”, which sounds like a name of a friend and is easy to pronounce.

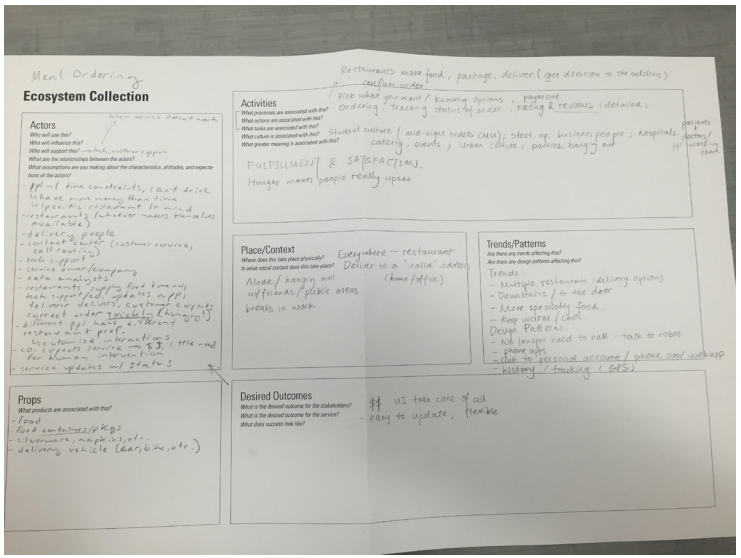
To design a CUI that simplifies group ordering process, we first researched on existing CUIs on the market and explored various scenarios that people might use them. With our initial version of our group ordering CUI, we kept on doing experience prototyping and made storyboards to explore more user needs and added more features to our design.

RESEARCH

Ecosystem Collection

To get started with our design of the food orerding CUI, we went through the ecosystem collection process which helped us understand the context of our product.

During the process, we analyzed the actors, props, activities, place/context, and desired outcomes.



Among the questions we asked ourselves, there were a few highlights that made us go further in discovering user needs and understanding how the product would work:

Q: What are the relationships between the actors?
A: Customers check for restaurants and order food, restaurants take the order and make the food, the delivery person delivers to customers.

Q: In what social context does this take place?
A: Student studying along till midnight; group of friends hanging our; breaks at work; meetings; home parties; hackathons, etc.

RESEARCH

Competitive Analysis

To better understand the current market, we did a competitive analysis by looked at four existing conversational UI products currently on the market: Google Home, Microsoft Cortana, Apple Siri, and Amazon Alexa.

We created a competitive analysis matrix that compares the unique features, strengths, weaknesses, speech recognition performance, and voice friendliness of the four CUI products. More closely related to our project, we also checked whether or not the four products support food ordering, and where do they order from.

It turned out that Microsoft Cortana and Apple Siri do not take food ordering at all, and Google Home and Amazon Alexa both only support a very limited range of restaurants, such as Domino's.

We also looked at the currently existing CUIs and listed out their user flow as a reference for our food ordering CUI design.

VUI Competitive Analysis Matrix

CUI/VUI	Amazon Alexa	Apple Siri	Microsoft Cortana	Google Home
Platform	Amazon Echo	iOS	Windows	Google
Purpose	Personal assistant: Order things on Amazon for you, play music, set alarms, control smart home	Personal assistant: make calls, search the internet, give you directions, schedule events	Personal assistant, same as Siri	Personal assistant, entertainment
Unique feature	Voice-controlled shopping	Enables hands-free use of iPhone	Set reminders on laptop and get notifications	Google search Ability to tie in to multiple google accounts Can differentiate users by the sound of their voice
Strengths	- Shop online - Stream music - Multiple Echos throughout house - Good language processing - Good for smart home management if you already have Alexa-enabled devices - Lots of 3rd-party "skills"	- Basic iOS actions: call, text, get directions, interact with other iOS apps (Apple Music, for example), change settings - Can hear long strings of commands: for example, "Text Mom <message>" - User can edit command after Siri hears it	- Show restaurant open hours, retail coupons, weather - Connects with laptops and phones - Set reminders for events on laptop and notify via Cortana - Integrated into Microsoft's products such as Edge browser - Sometimes humorous	Stream music Search google Get a personalized daily briefing Check traffic Check calendar Make a shopping list Check flight status Track a package Cast to TV with Chromecast, launch and control Youtube or Netflix via Chromecast
Weaknesses	- Can't network multiple Echos	- Often mishears commands and	- Sometimes slow in	- You can order household items, pantry

Meal Ordering CUIs Competitive Matrix

Restaurant/Brand	Domino's	Foodie	Ella
Feature Highlights	Hybrid of chatbot and standard website Users have limited input options (select from a list of options) In Facebook messenger	Users have limited input options (select from a list of options) More human like response (e.g., "Yummy!!") Users can go back and change previous selection Beta version	Use of emojis
Use Flow	• Greeting • Types of Pizza (veggie vs. non-veggie) • Specific pizza • Size • Options to customize • Number of pizza • Order info (customer name, phone number, email, address, time) • "You will soon get a call for confirmation"	• Show main menu vs. reserve a table • If choose show main menu: Pizza, sandwiches, burgers • Choose specific dish • Pick up vs. Delivery • If delivery, enter relevant info	Starting order Meal options (e.g., burgers, salads, dips and sauces) Order specific dish (may need to choose flavors) Choose: - Order more than one - Continuing ordering - Checkout Show order details Choose from: - Add drink - Enter order notes - I'm done ordering - Continue ordering Choose home delivery or pick up If pick up - Choose store - Choose time - Enter mobile phone

	Amazon Alexa	Apple Siri	Microsoft Cortana	Google Home
Order Food	Yes	No	No really	Yes
From where?	Domino's Pizza, Grubhub, Pizza Hut, Seamless, Wingstop		Just Eat. Users order via Just Eat with fewer manual steps	Domino, groceries

RESEARCH

Scenarios

Then we brainstormed on different scenarios where people might be needing our CUI to order food, and wrote a short story to describe the context for each of the scenarios. The scenarios we discussed about are:

- *A student working on his/her homework at school at midnight*
- *A person working late at home*
- *A party where a lot of people order together*
- *People working at a startup in a meeting ordering food*
- *Patients in a hospital hoping to get food*
- *Sick people who cannot get up easily*
- *A person on a diet trying to control his/her calories intake everyday*
- *A person with a healthy lifestyle always asking for calories before eating*
- *Someone allergic to a type of food who wants to avoid that ingredient*
- *Someone craving for a certain type of dish, like Japanese food or Korean food*
- *A person ordering food while in a car*

IDEATION

Initial Ideas

With the information we got from our research, we decided to work on a CUI that takes group orders.

We name our CUI Kara, since it sounds like a name of a friend and is very easy to pronounce. We then listed out some activities that we want Kara to support.

- *Order food for group*
  - *Summarize order*
  - *Recommend food/dishes*
  - *Change order or restaurant at any time in order*
- *Order ahead and schedule delivery at a specific time*
- *Account for allergies/preferences*
  - *Lists/checks food ingredients*
- *Remind you of utensils, etc.*
- *Explain types of food, restaurants, etc.*
  - *Checks database (what restaurants put in, etc.)*
- *Recognize location (GPS)*
- *Alternate input support (phone screen/call restaurant)*
- *Pause/resume interaction (for group discussion)*
  - *Remember where you are in the order*
- *Recognize and listen to single owner to avoid all of group ordering at once*

ITERATION

Experience Prototyping

We also went through experience prototyping to figure out more user needs that we didn't discover in our design process. We asked a few other groups to act in our scenario and recorded what questions they asked and what confusion they had.

During the experience prototypring, some people were confused about the food options - "Does it only have pizza ordering, or does it have something else?"; some people raised allergy problems and asked Kara to check for ingredients of food; some people asked for suggestions, like "How should I order?" or more specific concerns like "I think there are too many chickens in the group meal."

ITERATION

Critique & Refinements

During class, we also received some critique on our scenarios. Even though we had a fairly complicated user flow and a mixture of functionalities, there are still a lot yet to be improved: for example, Kara was a bit "boring" and acted just as a normal call center agency; we assumed Kara to be able to recognize whatever you say, which is not true in reality. Some of the critiques we got from class include:

- *We might want to assume that profile has already been created before we start our order.*
- *Errors need to be thrown, for example, if the CUI can't understand someone's words.*
- *We can think of adding personalities to our CUI.*
- *We can try to identify values that might not be directly benefiting end users, but benefit the business stakeholder.*

Based on these critiques, we refined our design and added some features that we didn't consider.

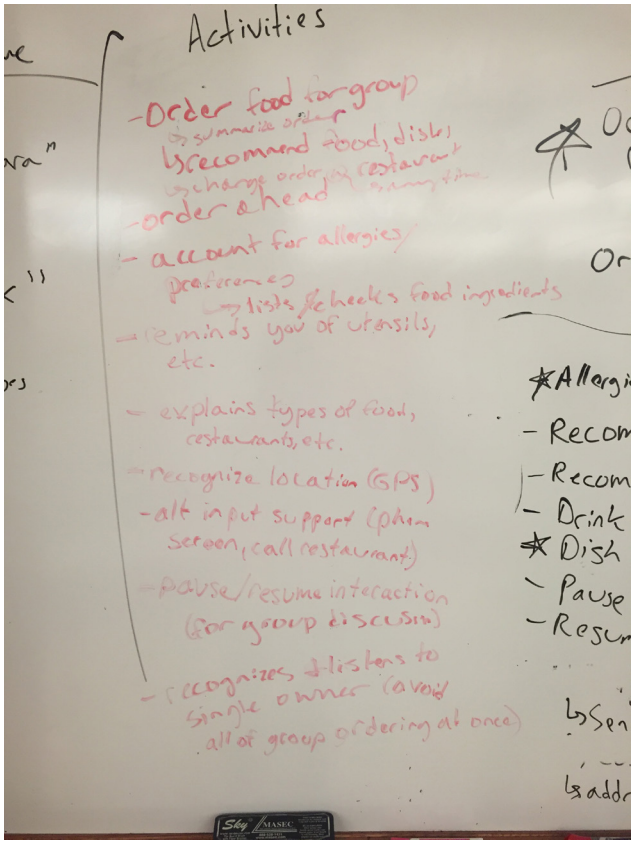
Things We Added

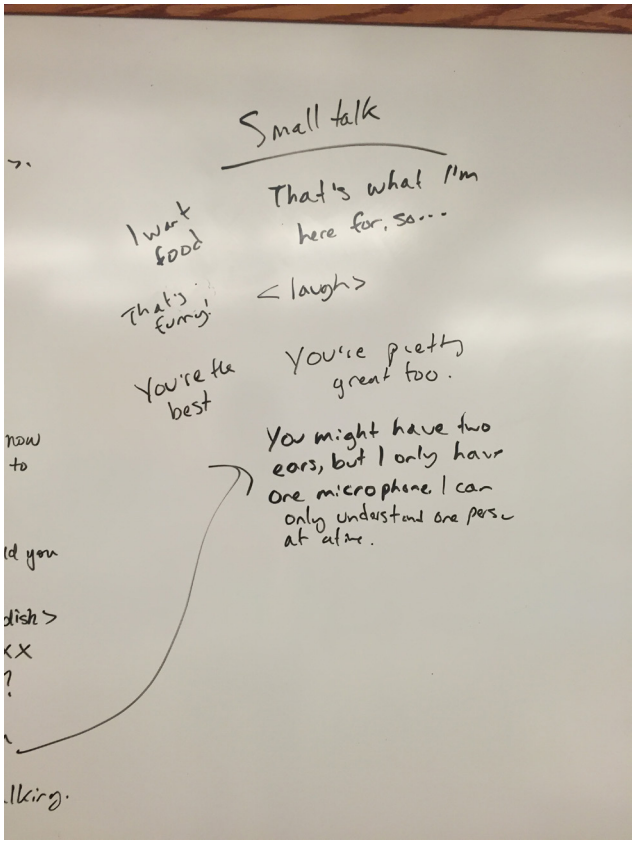
- *Personality (being sassy, hahaha, that's what I do)*
- *Users not pronouncing correctly and Kara trying to find what they actually mean*
- *Vegetarion option; allergy stuffs*
- *More prompts when users are confused or forget what they are doing*
- *Asking for something not on the menu causes Kara to look for other restaurants*
- *Remind user after a minute in case they forget (hey, are you still there? Let me know when you want to continue with it, etc.)*
- *If user doesn't know exactly how many people are in the group, she uses the upper bound*
- *Prepared to answer "stupid questions" (how do I pay)*
- *Searching on Google for general questions (what is Yelp)/One-sentence description (what is this place)*

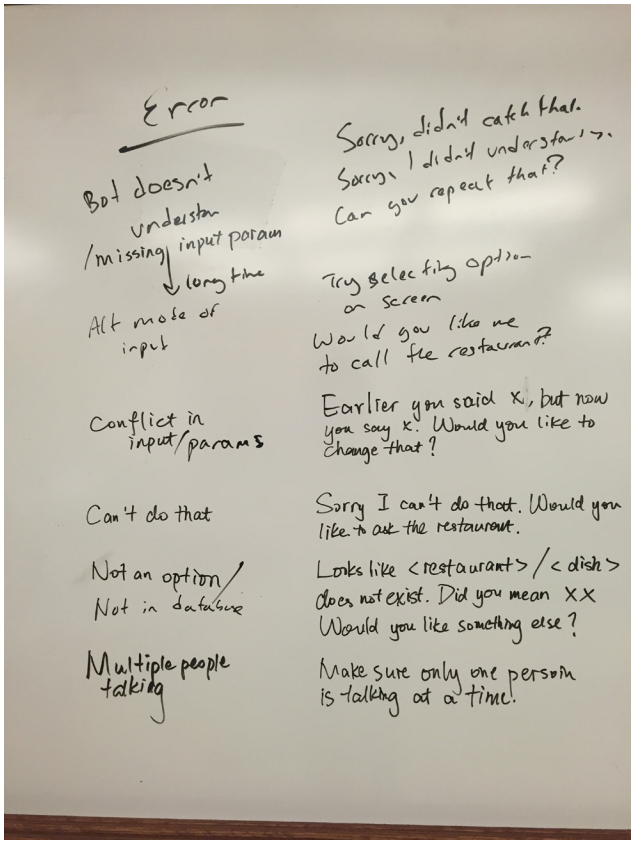
ITERATION

More Refinements

Summarizing our findings in the experience protyping and during critique, we revised the range of activities we want Kara to support, added small talks to our design to make Kara more humorous, and included error handling in case Kara has difficulty handling user input.





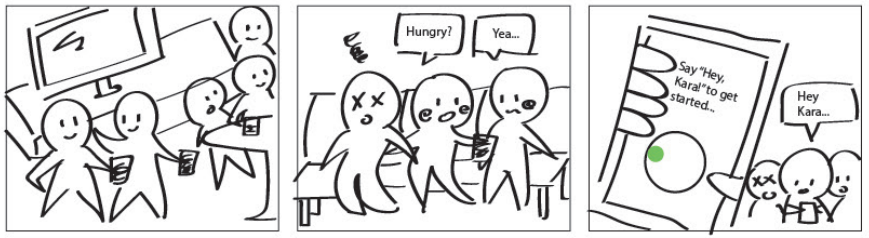


ITERATION

Storyboard

To better understand the context of our CUI, we made a storyboard of when and how people would use Kara for group ordering.

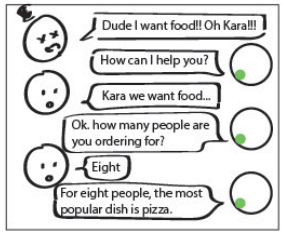
We set the scenario to be a group of people at a party, getting a bit tipsy and quite hungry. So they started talking to Kara to order some wings. Kara asked for how many people are there in the group and gave a suggestion on what kind of food to eat and how much to get. While asking for preferred flavors, a lot of people were talking at the same time, and this was identified by Kara as an error, and asked them to only let one person talk at a time. The user asked Kara some information about the restaurant suggested, and Kara searched on Google and provided the user with a brief summary of the restaurant. Before sending our the order, Kara found that the user forgot to include utensils, and reminded the user to add them. In the end, Kara detected the current location using GPS and directly sent the delivery to the current address.



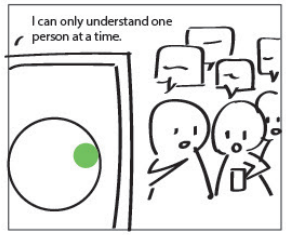
1. Joe is hosting a halloween party at his home this weekend.

2. After chatting, drinking and playing board games for a while, people start to get tipsy and hungry.

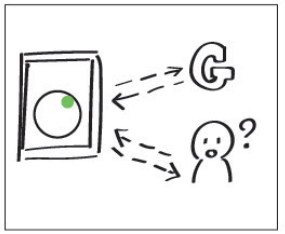
3. Joe pulls out his phone, and starts to order food via his virtual assistant, Kara.



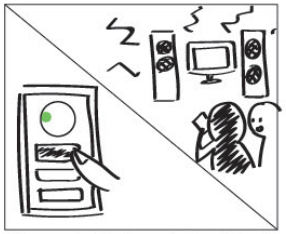
4. After detecting that Joe is ordering food for a group of people ("we"), Kara asks for the size of group and gives recommendations accordingly.



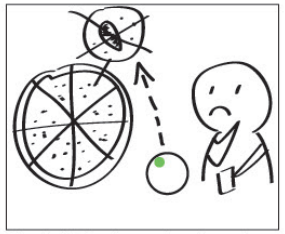
5. Joe's friends all get very excited, and all start to speak out what they want. Only following the instructions given by Joe, Kara asks the group to quiet down.



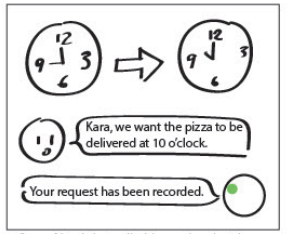
6. Joe has never heard about a dish on the menu, so he asks Kara what that dish is. Kara retrieves information from the Internet, and explains that dish to Joe.



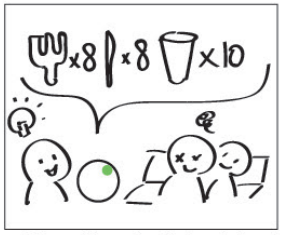
7. Someone starts to play very loud music. Kara has a hard time catching what Joe is saying, so she asks Joe if he wants to talk to a real person in the restaurant or selects a option on his phone. Joe chooses to tap on his phone.



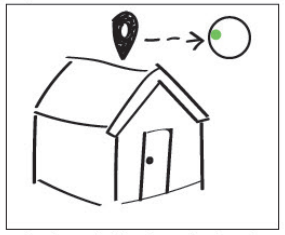
8. Joe decides to order some three cheese pizzas. By pulling up the ingredient information, Kara detects that they contain pine nuts which Joe is allergic to. Kara asks Joe if he wants to change his order or send a request to the restaurant to remove the pine nuts.



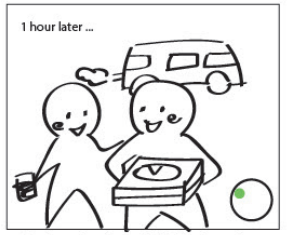
9. Some friends just called Joe saying that they would swing by in an hour, so Joe wants to have the pizzas delivered later. Kara records his request and schedules the delivery.



10. Before sending out the order, Kara asks Joe and his friends if they need any utensils. Joe and his friends are happy that Kara reminded them of getting utensils.



11. Kara detects Joe's location, and confirms that the pizzas will be delivered to Joe's home address.



12. One hour later, Joe and his friends get pizzas delivered. Now, they can enjoy the party!

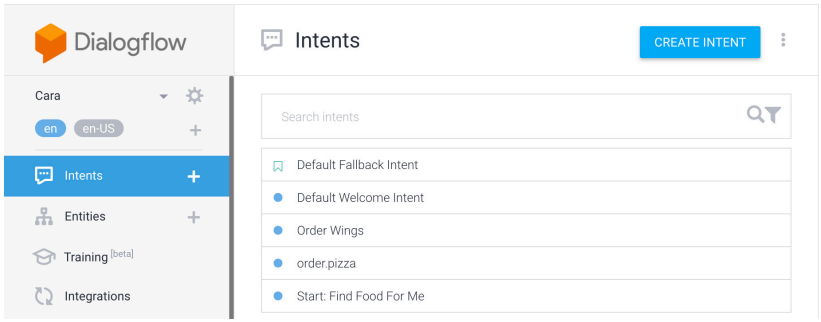
ITERATION

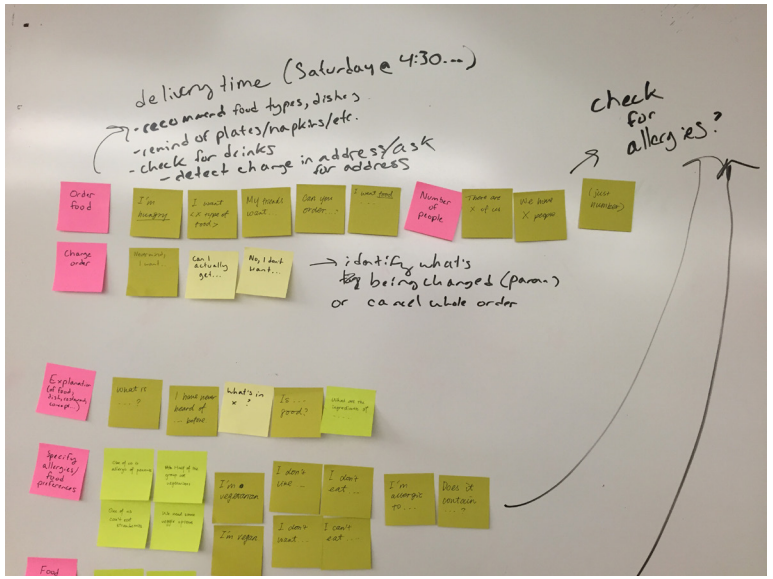
Flowchart

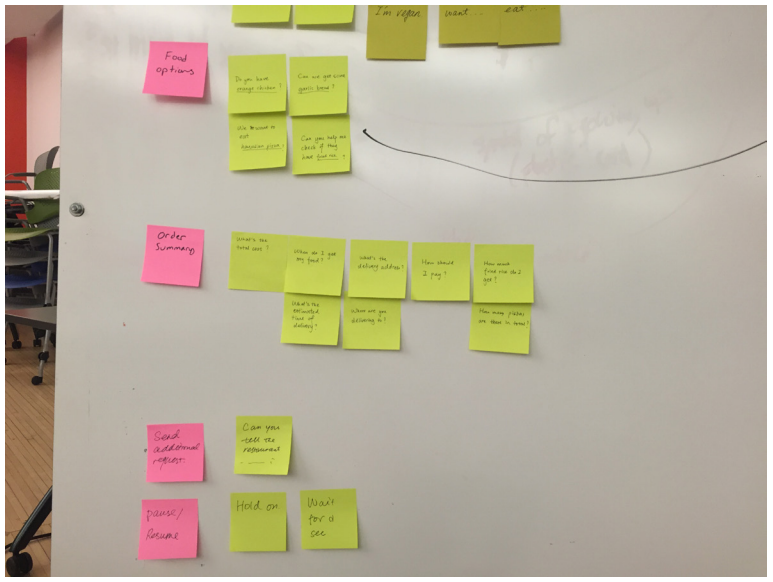
To get prepared for the flowchart of our final design, we went through our refined pre-attentives and attentives, and listed out the utterances and responses for each attentive using stickers.

In the "order food" attentive, we included multiple features of setting delivery time, recommending food types and restaurants, reminding of utensils, reminding of drinks, detecting change in location using GPS, etc.

We also played around the CUI prototyping online tool API.AI (Diagflow) and built a simple version of Kara to test with.



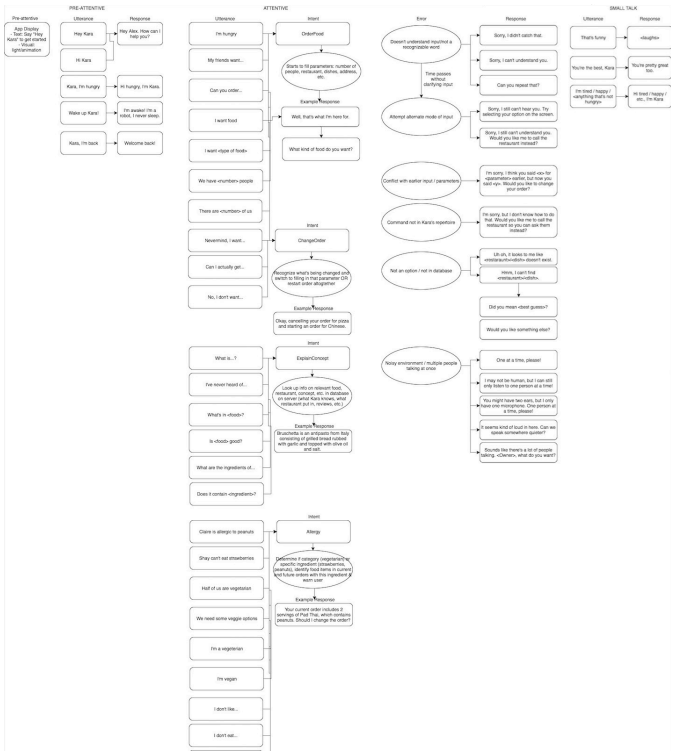


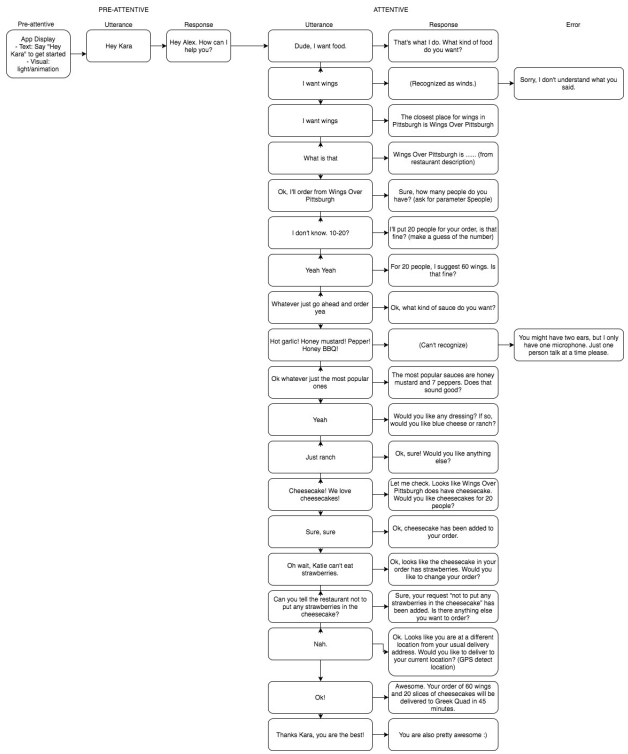


ITERATION

Flowchart

After the two rounds of experience prototyping, critique, and refinements, we created the conversational \ flowchart of Kara, on both the general ordering procedure and the specific user flow in the party ordering scenario we worked on. The flow charts consisted of pre-attentives and attentives, each has different utterances and responses, with a few error-catching features with response.





ITERATION

Concept Video

For our concept video, since it was just around Halloween, we chose to film a scenario where a group of people forgot to order food for a Halloween party. On the right is the script for the video.

Since everyone was busy preparing for the party, Alex used Kara to help them order pizza.

With the given number of people coming to the party, Kara suggested an estimate of how much pizza to order. Kara recognized that a lot of people were talking at the same time, so she asked them to only let one person talk at a time.

Kara also helped Alex check for ingredients Alex is allergic to, and reminded her when she added something that included such ingredients to her order. At last, Kara figured out the current location using GPS and delivered the food to their house.

FADE IN

EXT. ALEX'S HOUSE - DAY
A view of Alex's house from the street. It is still day outside. We hear light, upbeat music and light chatter.

INT. ALEX'S LIVING ROOM - DAY
Inside the living room of Kara's house. A group of people are decorating the room for a party. Everyone is busy.

PERSON 1
Oh my gosh, we still need to order food for the party tonight!

TEXT OVERLAY

V.O.
Why does group food ordering have to be so hard?

INT. ALEX'S LIVING ROOM - DAY

ALEX
Hey, Kara!
KARA
Hey Alex.

TEXT OVERLAY

V.O.
Introducing Kara. Group ordering made easy.
INT. ALEX'S LIVING ROOM - DAY
V.O.
Kara knows how much food to get, so you don't have to.
ALEX
Kara, we need pizza for the party tonight.
KARA
Sounds like fun! How many people are coming?
ALEX
I don't know, ten, twenty?
KARA
For twenty people, I suggest ordering ten pizzas.
ALEX
Ten?
(laughs)
Yeah, let's do it!
V.O.
Kara also knows how to handle noisy crowds.
KARA

Okay. What kinds of pizza do you want?
Alex opens her mouth to answer, but then everyone else in the room starts chiming in with their favorite kinds of pizza.
KARA
I'm sorry, it sounds like a lot of people are talking at once! Alex, what do you want?
ALEX
Kara, can you hold on a sec?
KARA
Sure. Just let me know when you're ready to order.

TEXT OVERLAY

V.O.
Kara can handle everything about your group food order, from calculating the amount of food, to recommending popular options, to placing an order for sometime in the future, to reminding you to order enough utensils and napkins.
She even remembers what you or other people in your group are allergic to.
TEXT
Amount
Popular Options
Ordering Ahead
Utensils
Allergens

INT. ALEX'S LIVING ROOM - DAY

ALEX
Kara, what's the Greek Special pizza?
KARA
The Greek Special includes feta cheese, olives, and--
ALEX
Oh, that sounds good, order that.
KARA
The Greek Special also contains nuts, which you told me you're allergic to. Would you like to change your order?
ALEX
Oh, thanks for catching that, Kara! Yeah, can you ask them not to put nuts on it?
KARA
Sure, I'll let them know.

GRAPHIC OVERLAY
A graphic of Alex's house with a location marker overhead. As the voice over speaks, the location marker pings and a graphic of the restaurant appears. An arrow is drawn from the restaurant to the location marker.

V.O.

Kara automatically knows where you are, and sends the delivery straight to your door without having to input an address.
KARA
Your pizza will arrive at 7:30 PM.

EXT. ALEX'S HOUSE - NIGHT
The same view of Alex's house from the street, now dark out. The music has changed to be driving and upbeat--party music. People are shouting, laughing, and talking inside.
A delivery person carrying pizza runs up the front steps towards the front door.
KARA
Your pizza has arrived.

INT. ALEX'S FRONT DOOR - NIGHT
The door to Alex's apartment. The pizza delivery person stops in front of it and raises a hand to knock, but before they can, the door swings open, showing Alex.
ALEX
Thank you!
The pizza person hands off the pizza and then leaves. Alex closes the door after them. We stay on a view of the closed front door.
ALEX
(from behind door)
Pizza's here!
The party chatter is momentarily overtaken by a muffled cheer.
GRAPHIC AND TEXT OVERLAY
Kara's graphic / screen image.
ALEX (v.o.)
Thanks Kara! You're the best.
KARA
You're pretty great too.
V.O.
Kara: Group ordering made easy.

FADE OUT

1

(An outside view of the house)
(Music)

2

(People decorating the house and preparing for the Halloween party)
<Person 1> Decorating the house
<Person 2> Pouring candy to the bowl
<Person 3> Putting on costume
"Hey we still need to order food"
"Hey Kara!"

3

(Kara Group Ordering)
(Voice Over: Kara - the personal group order assistant)

4

(<Person pouring candy> in the foreground, trying to order food; other people in the background)
J: Kara, we need pizza for the party tonight
K: Ok, how many people.
J: I don't know - 10, 20?
K: Ok, I'll order for 20 people. Is that ok?
J: Sure!
K: For 20 people, I suggest ordering 8 pizzas in total. What kind of pizza do you want?

5

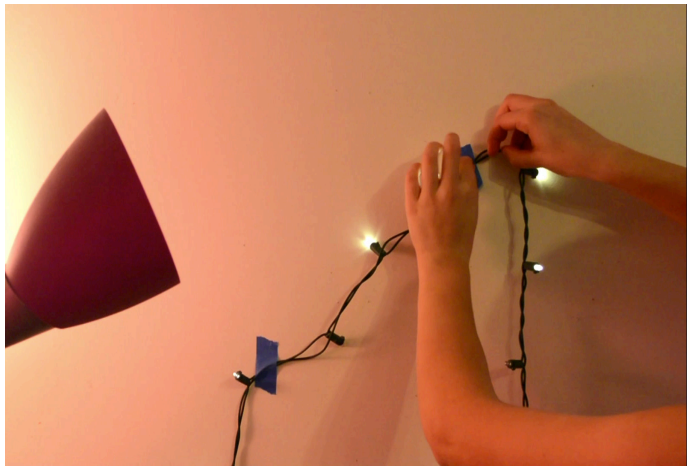
(Everyone yelling)
K: I'm sorry, it sounds like a lot of people are talking at once. Judy, what do you want?
J: Can you hold on a sec Kara?
K: Sure. Let me know when you're ready to finish ordering.
(fade to black)

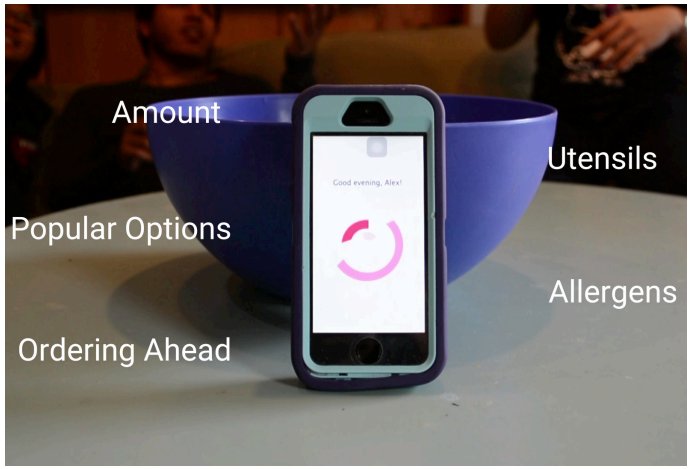
6

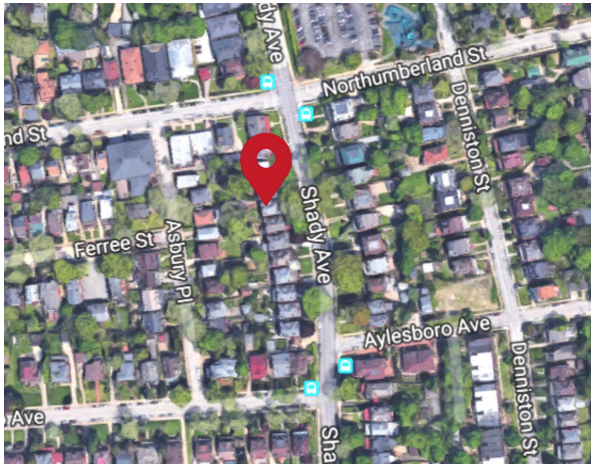
(Text & voice over?)

ITERATION

Concept Video







Kara

A conversational UI that makes your group ordering much easier