

**Dash** 

# SHOPPING ASSISTANT IN WAREHOUSE ENVIRONMENTS

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Basic Interaction Design 51-725

# PROBLEM STATEMENT/FRAMING

## **Develop VUI to:**

- account for multiple user interaction, or single user interaction while others are present.
- assist users while shopping, specifically, in warehouse environments like Home Depot.



# MEET DASH



# CONTRIBUTION

## **target problems**

- During peak shopping times, there are not enough customer service representatives to assist all customers with all their questions.
- Representatives do not have full knowledge of all items in the store.

## **solution**

- Dash is a first response system.
  - meant to assist shopper with basic queries
  - call a representative when required or asked
  - alleviate the stress from navigating an unfamiliar place
  - help with the efficiency of the customer's experience
- Dash provides recommendations and suggestions, without the user having to wait on a service representative.



# PRIMARY RESEARCH

## **initial concepts**

- Travel instructions and guidance when going through customs and immigration at an airport
- Refrigerator management -- expiration dates
- Physical Therapist simulation to aid independent exercise for patients with arthritis using motion capture along with VUI.
- Public restroom controls
- Educational games for blind children
- Store item finder, price checker, and route finder (Giant Eagle, Ikea, Home Depot, Lowes, Costco)



# PRIMARY RESEARCH

## **literature review learnings**

- feedback - ensuring the correct information is conveyed to the system
- progressive prompting & feedforward - ensuring the user is aware of the system's capabilities
- earcons - implicitly notify the user of a change in system status
- tapering - reduces information overload and the feel of repetition



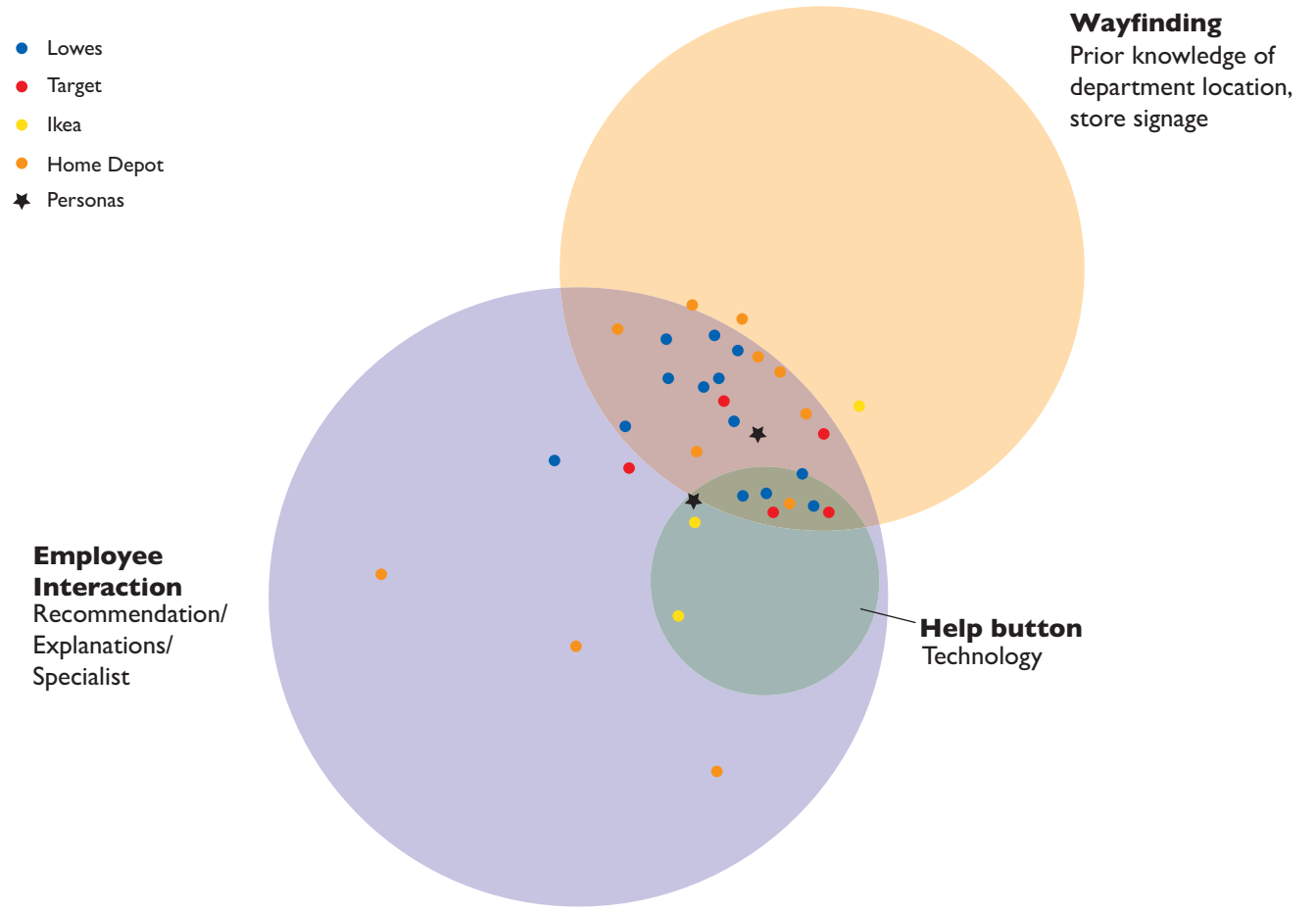
# PRIMARY RESEARCH

## competitive analysis

- In-store help buttons
- In-store kiosks
- shopping online
- mobile applications on smart phones
- customer service representatives



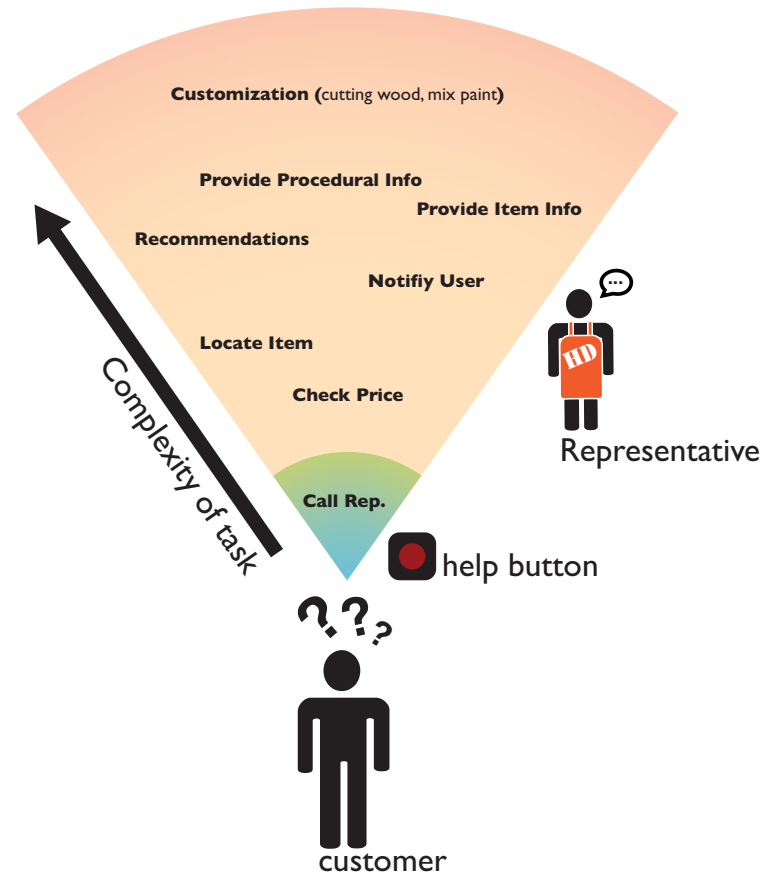
# PRIMARY RESEARCH



**Current State:** Ways people find their items



# PRIMARY RESEARCH



Current state



# PRIMARY RESEARCH

## **implications for design**

- shopping habits - hands free, may not be with their cart at all times - attached to cart but can be taken off and attached to belt (customer)
- device decision - multiple shoppers - no headphones (customer)
- look for discounts (employee)
- require recommendations and suggestions (employee)



# SKETCHING/INITIAL CONCEPTS

## **functionality**

- item navigation
- recall list from online
- discounts navigation
- list organizer
- bill pay, tally bill so far
- price lookup
- call for representative

## **device design**

- very conversational
- headphone device, mic
- RFID
- Home Depot card



# SPEED DATING

## **probe**

User is painting a room in a home, they don't shop frequently at Home Depot, and they are not familiar with the given task.

## **need**

- Find items required to complete their proposed project.
- Navigate to items efficiently.
- Get recommendations about which product to purchase.
- Stay within budget.

## **lead**

Have you ever walked into Home Depot with an item you need to purchase to complete a task you don't know much about?



# SPEED DATING

## **process**

- We tested users one by one
- Informed each tester of context, and let them interact as they saw fit
- During the speeding:
  - One person acted as our VUI
  - One person recorded conversation
  - One person took notes in problem spots during conversation
  - One person observed user with VUI during conversation
- Asked for feedback from testers after each run through scenario with VUI



# SPEED DATING

## findings

- Needed to prompt people to walk to item location
- When user creates a long shopping list, system needs to give feedback in more concise way - divide by department
- Bill tracking feature was confusing
  - the concept of an online shopping cart didn't translate to VUI and physical space, especially when someone wasn't using a cart
- Needed to add more confirmations
- Needed to add in more reminders of how to ask questions/interact with Dash



# SPEED DATING

## **additional feedback**

*from Amar Kapadia, Vocollect*

- Consider how the system works when more than one person is shopping.
- Consider what happens when the user reaches the limits of the system's intelligence.
- Consider what happens when there is a long list that needs to be confirmed with the user.



# SPEED DATING

## insights

- People seemed to need guidance with this system, they needed cues about what the system was doing: thinking, waiting, calling representative...
- People's tolerance for completing a task with VUI is low—still need easy access to representatives, and need to know that they don't need to repeat everything to a representative.
- People liked reminders.
- People may not shop alone and may have side conversations that do not pertain to system commands.



# SPEED DATING

## **effects on design**

- Added capability to system to handle more than one shopper at a time.
- System takes initiative to call a representative early in query process so customer does not become frustrated.
- Need to incorporate earcons to inform the user of reminders or standby mode.
- Incorporated more feedback, instruction.



# FINALIZE CONCEPT

- accounts for multiple users & single user interaction while others are present
- accounts for side conversations
- narrowed to really focus on list creation, recommendations for items in the shopping list, suggestions for additional items to help complete project, and discounts
- no headset
- no home depot personal shopping accounts
- no “shopping cart” bill tally feature



# FINALIZE CONCEPT

## script excerpt - multiple users

*Dash:* Great. I'm creating a new shopping list for you. Say the items you'd like to add.

*User:* Paint. [...]

*Dash:* I heard you needed paint and a paint brush. *Is that correct?*

*User:* Yes.

*Dash:* I've added paint and a paintbrush to your shopping list. Paint is located in aisle 17. *Let's go there now.* *Users walk.*

*Dash:* At any time, you may ask a question by *saying Dash* and stating: *recommendations, check price, find item, or representative.* *I'll be standing by.*

*User 1 and 2 have a conversation [...]*

*User:* *Dash,* I need a recommendation.



# FINALIZE CONCEPT

## storyboard

The storyboard for our video sketch was based on our script; initial sketches indicate the vantage point from which we wanted to capture users interacting with Dash.



# FINALIZE CONCEPT

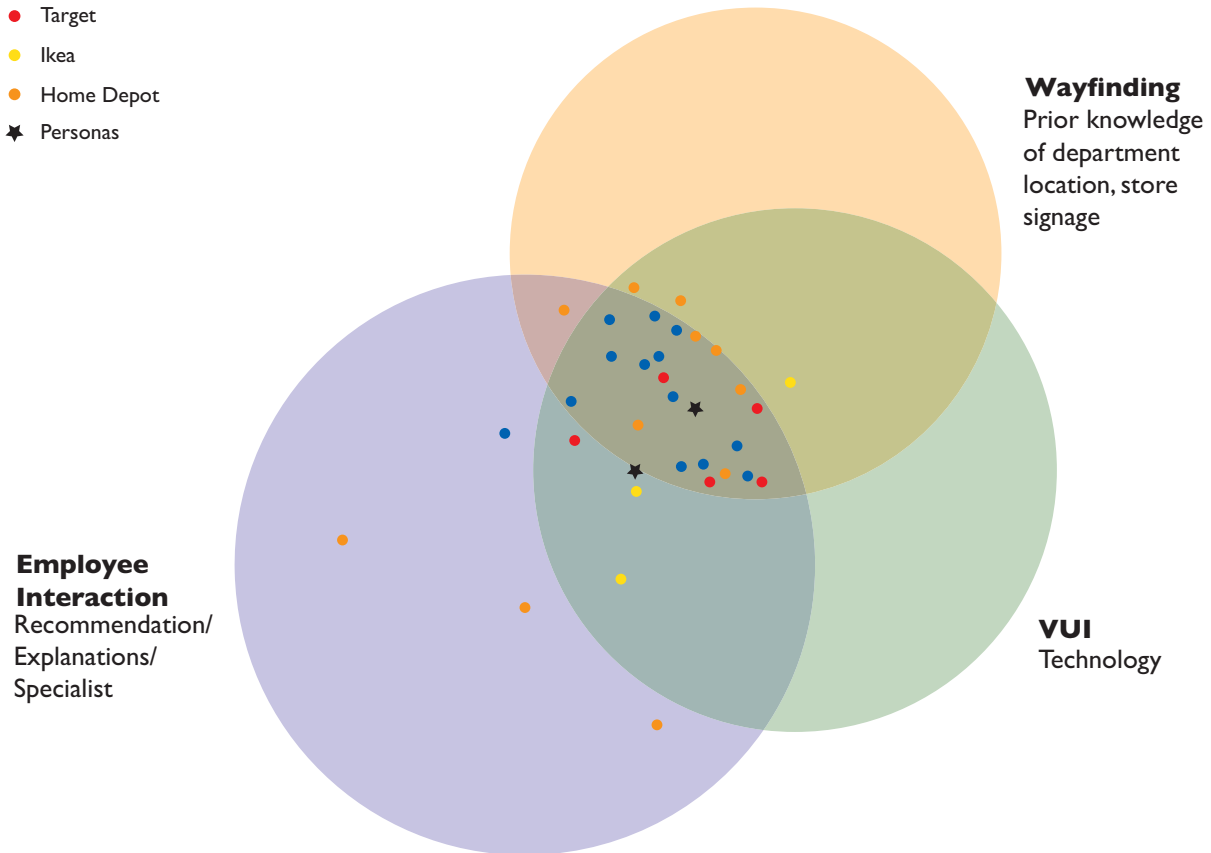
## earcon selection

- Start-up sound to indicate to user that VUI is activating: *selected to acclimate the user to the system and set the tone for their experience*
- Standby sound to tell user that it is waiting for input: *selected to help teach the user that the system will wait until the user wants to interact with it. This sound says, "I'm still here, but I'll be patient."*
- Chime to remind and alert user that something they've ordered is ready or that a customer service representative is on their way: *selected to get the user's attention, without being jarring or startling*



# FINALIZE CONCEPT

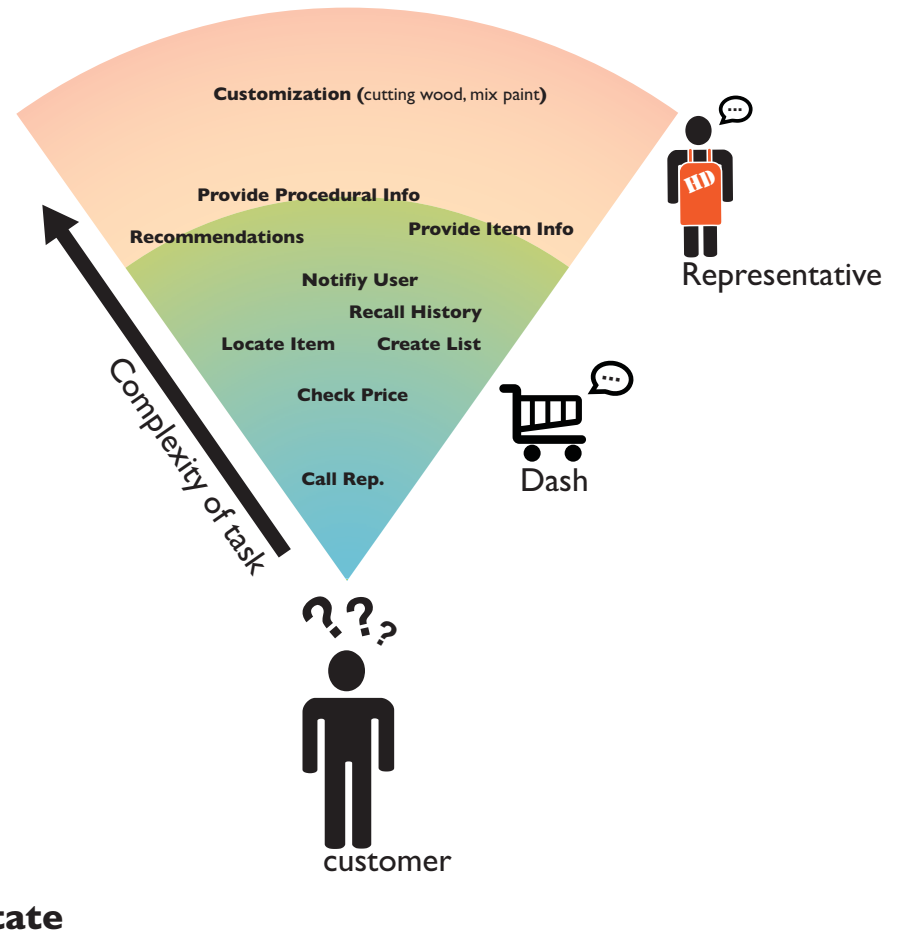
- Lowes
- Target
- Ikea
- Home Depot
- ★ Personnas

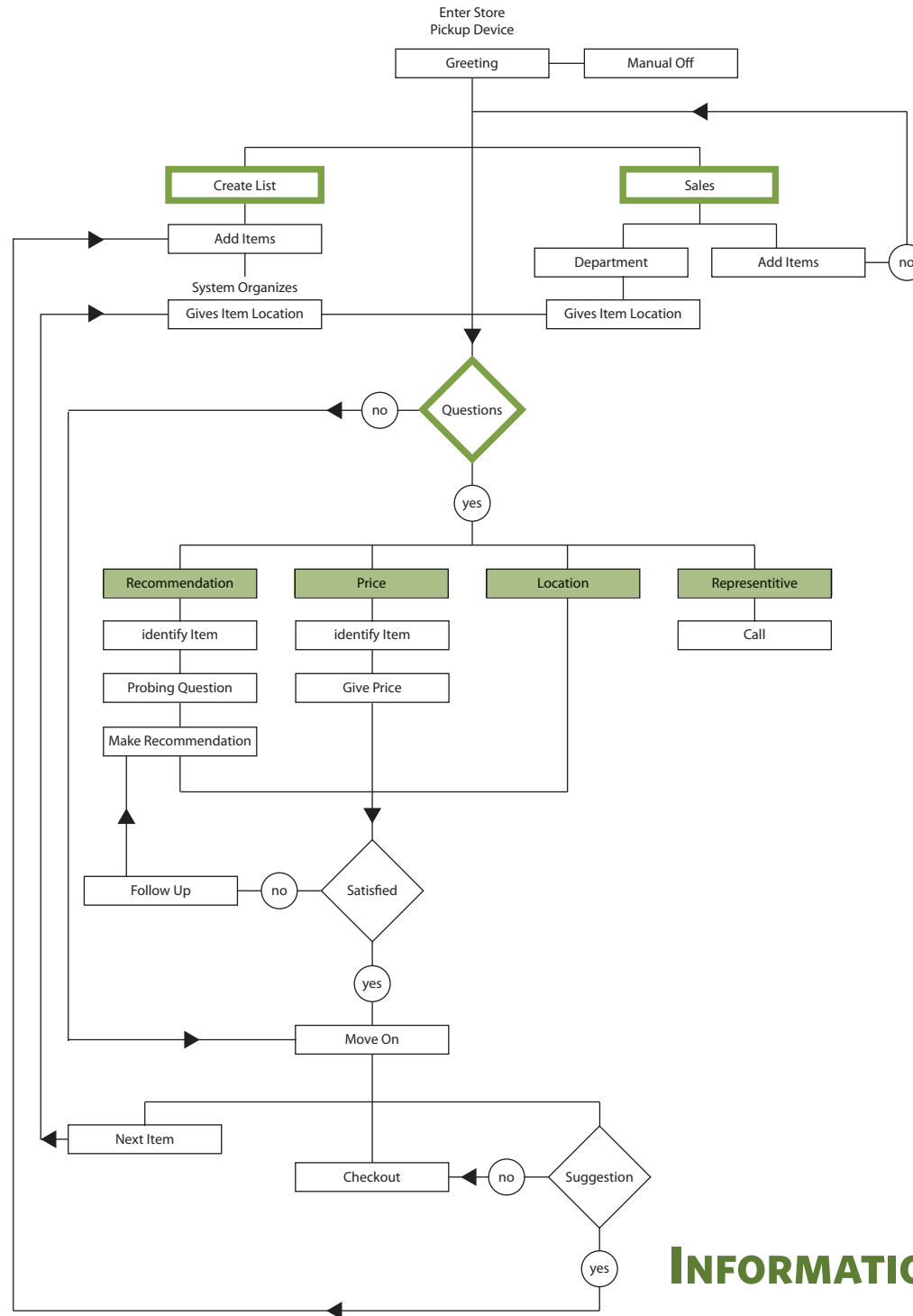


**Desired State:** Ways people find their items



# FINALIZE CONCEPT





# PERSONA



## **Laurie, 25**

- Teacher at children school at Carnegie Mellon
- Takes classes at CMU in child psychology
- Preparing for the Pittsburgh Marathon on May, 2nd 2010
- On weekends off she takes ski trips with her friends to Seven Springs

## **life goals**

- Maintain a healthy lifestyle
- Become an child psychologist
- Support her family
- Become independent, move out of Pittsburgh



# PERSONA



## **Karen, 29**

- Expecting a baby boy
- Researcher for breast cancer at UPMC
- Taken to baking -- and then eating all the cake
- Husband is consultant at Deloitte so always travelling

## **life goals**

- Maintain a healthy lifestyle
- Tries her best to contribute to her field of research, and works to spread awareness about breast cancer
- Support her husband and baby
- Spend more time with her family



# PERSONA



## **combined experience goals**

- If they use a system for assistance, want it to be easy to use
- satisfied with their shopping
- take more advantage of the technology available
- able to make decisions confidently

## **combined end goals**

- Is satisfied with shopping experience: efficient, got items they wanted/needed
- To find what they need easily
- Feels like the store provides recommendations, can identify what they're looking for, and works hard to accommodate their needs
- Wants to be able to find and receive assistance when they want it so they can browse at their leisure



# SCENARIO

Laurie is helping her sister Karen paint a room for her; she's expecting a baby boy. Karen's husband is travelling for work, both Karen and Laurie do not have experience with painting a room. They are not frequent shoppers at Home Depot but since it is close to their house they decide to go there on a Saturday afternoon.



# CURRENT STATE

- Karen tries to get information about painting supplies from the internet while Laurie asks her friends in college for advice.
- They arrive at Home depot with a list of items they require but have trouble finding the products they looked up before, and are overwhelmed by the choices present to them.
- With difficulty they find an employee to ask for assistance.
- The employee is busy so they need to wait a while before getting the assistance they need.
- Even after getting his attention, he only quickly answers their questions as he has other customers awaiting his assistance.



# FUTURE STATE

Karen and Laurie enter Home Depot and pick up a shopping cart.

Dash greets them and assists them with their shopping by:

- prompts them to provide an initial list of items that they are interested in buying
- directing them to the location of the items on the list
- providing recommendations on brands, and prices in relation to their project
- providing additional suggestions on other items that may be helpful

Dash goes into standby—can be awoken by the user when needed.



# DETAILED SPECS

- **Accommodates multiple users** and recognize different voices by voice recognition
- Makes brand and price **recommendations** based on user's specified list items
- **Suggests other items** that may be helpful
- **Idles** when user is not asking a question
- **Reminds** users to pick up items they are having prepared
- Device can be **attached to shopping cart or clipped** to pocket
- **Calls a representative** and **relays information** when user needs additional help



# VIDEO SKETCH



# LESSONS LEARNED

- narrow focus on the intended functionality of the system
- make sure the system fulfills needs of persona
- VUIs require affirmations and confirmations on user input
- user learning curve is fairly large, important to ensure
  - consistency consistency consistency
  - simplicity simplicity simplicity
- create a benchmark point for when the VUI becomes too complex - call a representative



# NEXT STEPS

- allow for user accounts so that the system can remember the user's previous purchases and make informed recommendations
- could be adapted for other warehouse shopping environments
- consider how multiple users may use the system when they want to split up during their shopping experience, removable part of device or ability to sync two devices
- incorporate a function that allows users to track the amount they've spent
- allow for easy check-out



