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# *Poetry in Motion*

ETM 556/656: User-Centered Innovation  
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# Agenda

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- Introduction
- Methodology
  - Interview
  - Observation
- Identify Needs
  - Affinity Diagram
  - Brainstorming
- Offering
- Conclusion

# Introduction

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## Growing Market Need

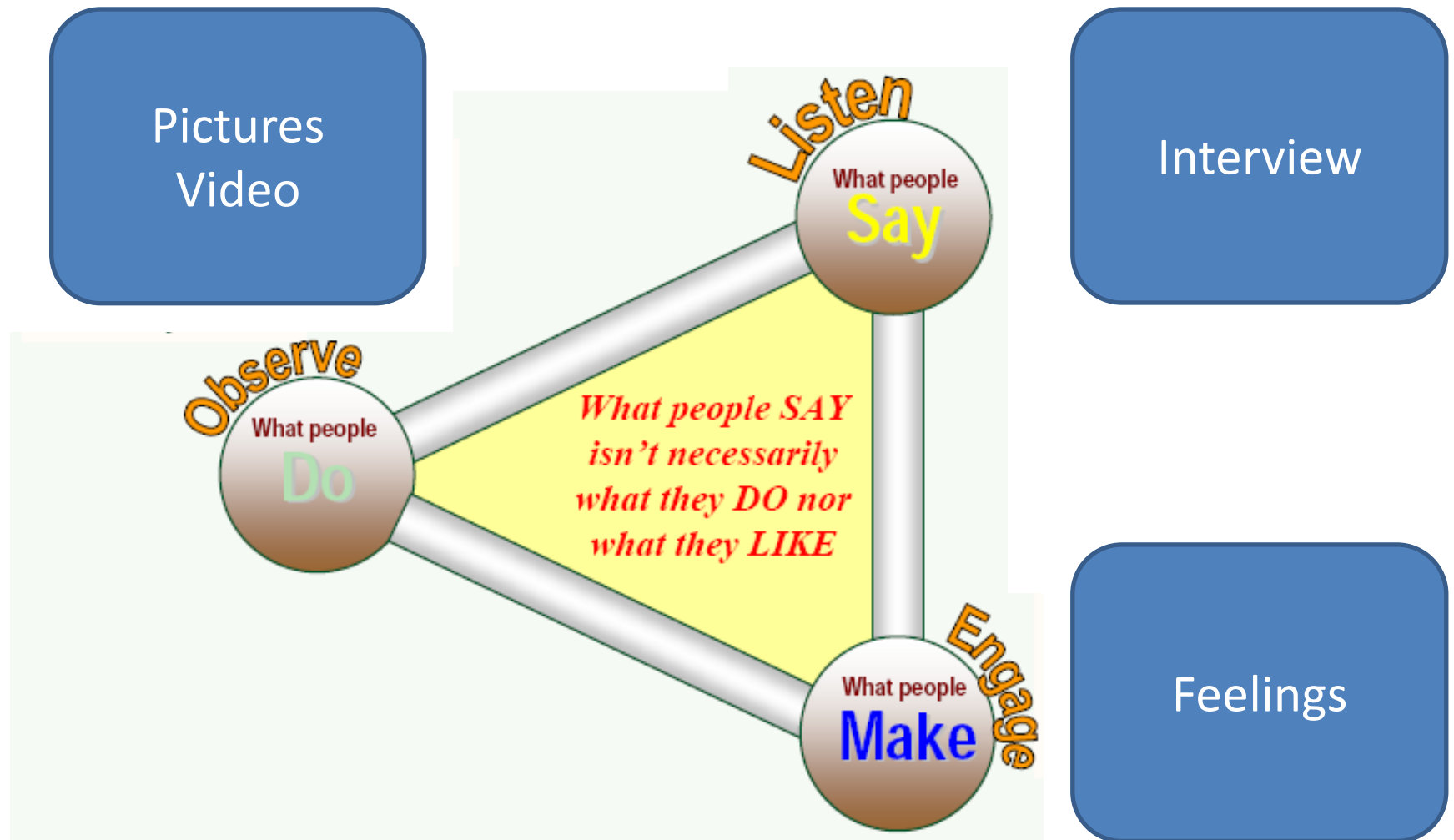
- 6.8 million using assistive devices
- 1.7 million wheelchair / scooter users
- 1.5 million people use manual wheelchairs
- 155,000 electrically powered wheelchairs
- 142,000 use scooters

## Research Focus

Our team would like to understand user's daily activities, feelings, needs, and challenges in order to help build a better mobile solution and independent lifestyles.

# Methodology

## Overview



# Methodology

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## Themes for Research

- Explain how mobility improves your life (or not).
- Tell us more about the types of solutions that you considered.
- Share a time when you felt people treated you differently when using a mobility solution.
- Tell us about places that you like to go but can't because of limitations of current solution.
- Describe the performance characteristics that you would like to change or have.
- Share any concerns you might have regarding safety related to these solutions.
- Describe economic challenges current solutions present

# Methodology

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## Interview

Interview	Location	Position
1	OHSU	Transportation Manager
2	OHSU	Nurse
3	Street near Safeway (PDX)	Power Chair User
4	Street near Safeway (PDX)	Power Chair User
5	Lloyd Center	Power Chair User
6	Lloyd Center	Power Chair User
7	Safeway (LO)	Power Chair User
8	Safeway (LO)	Power Chair Helper

# Methodology

## Observation

- Notes
- Pictures
- Voice recording
- Video capture



OHSU Transportation Services



OHSU Transportation Services



# Methodology

## Observation - Shopping Challenges



access blocked  
for other shoppers



shopping cart pulled  
behind power chair



brings chairs out to car &  
pulls them in out of rain



# Methodology

## Observation - Shopping Challenges



Winco, Tigard OR



Typical Controls



Costco, Tigard OR



Fred Meyer, Portland OR



No Passengers

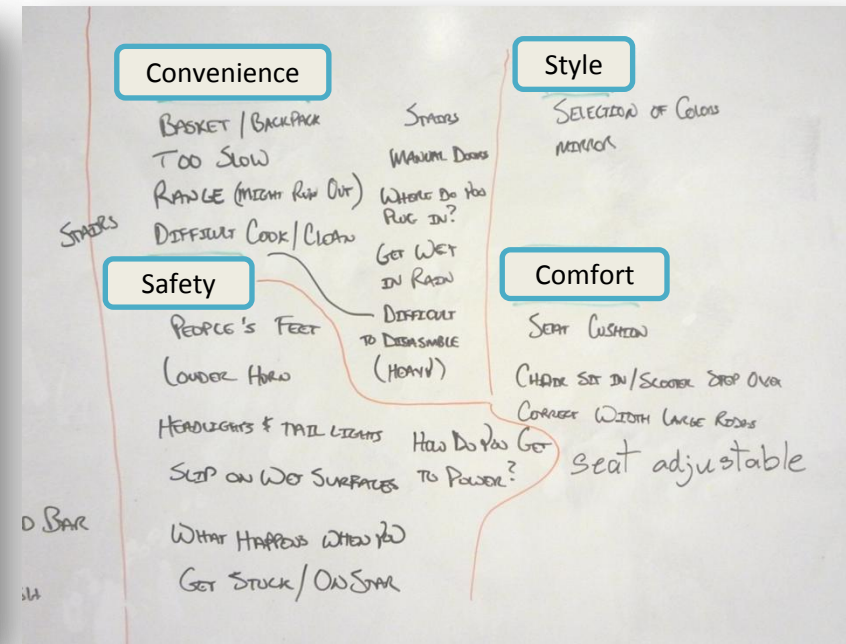
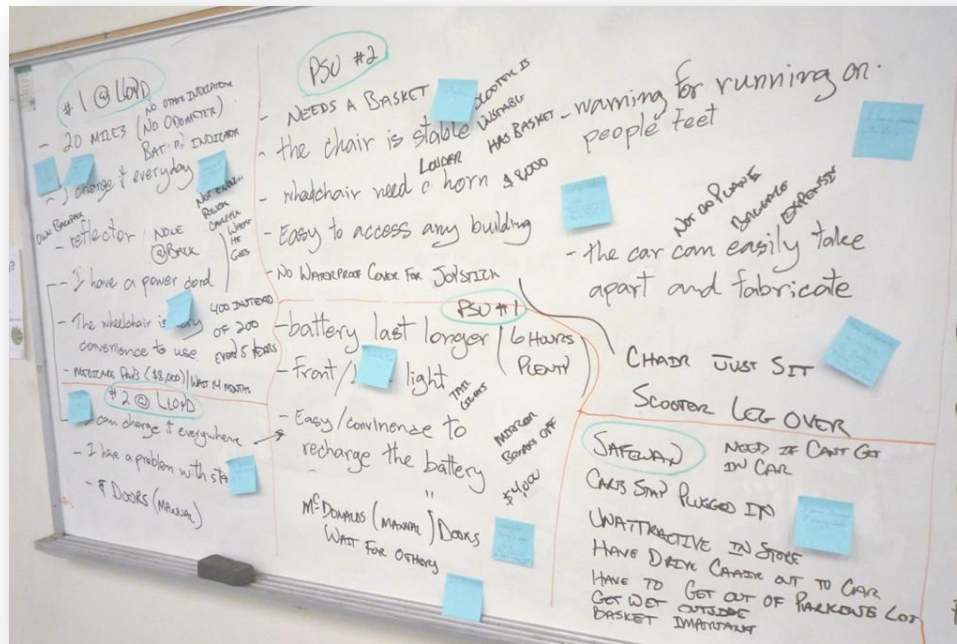


New Seasons, Lake Oswego OR

# Identify Needs

## Affinity Diagram

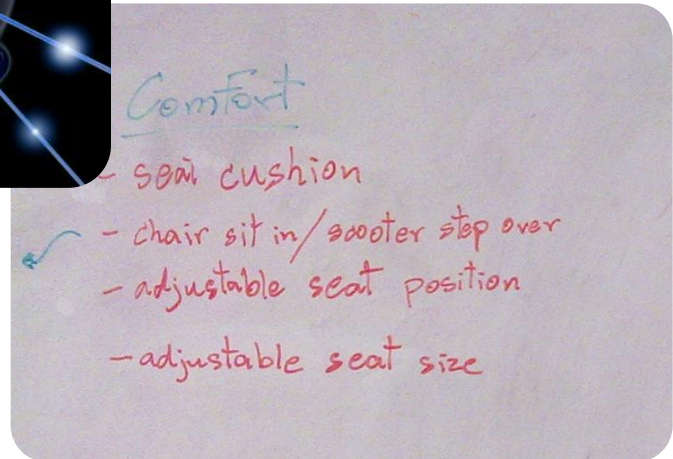
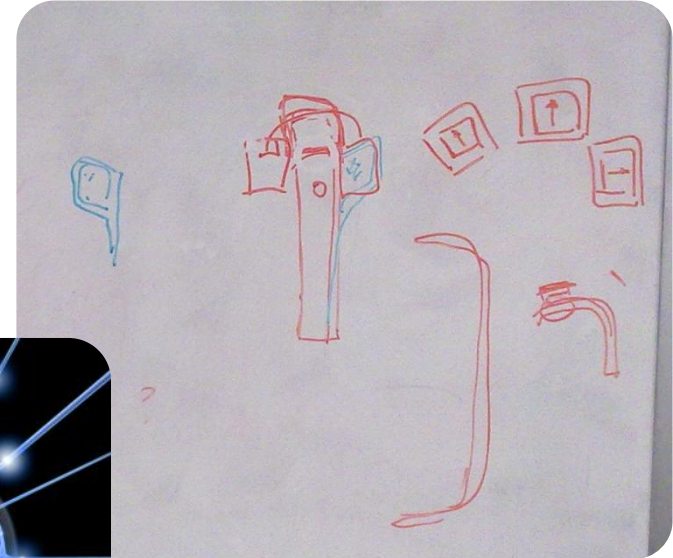
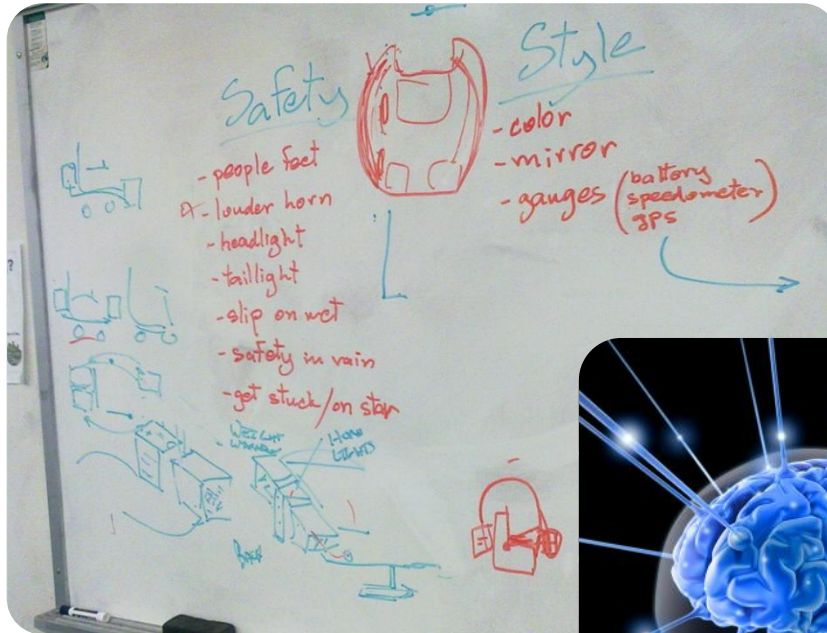
- Listing the customer voice
- Grouping the similar voice





# Identify Needs

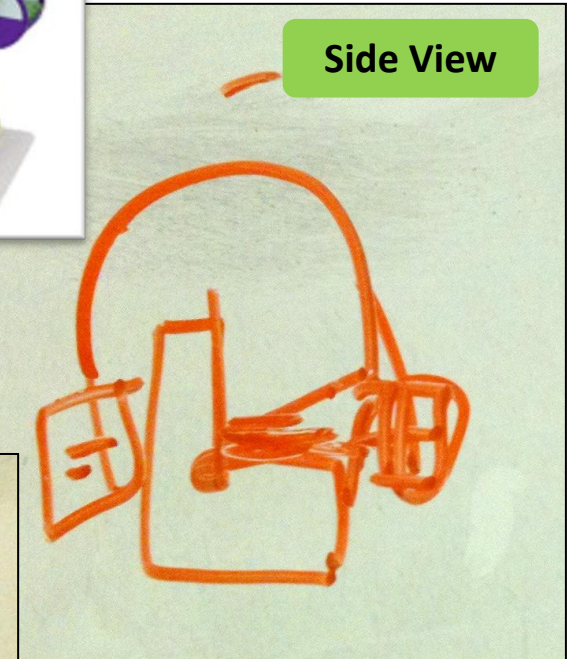
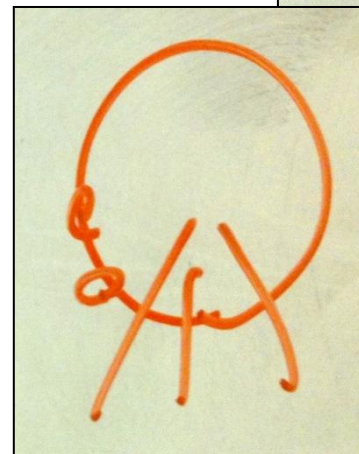
## Brainstorming



# Identify Needs

## Brainstorming

- Basket Composition
- Basket Retraction
  - Manual/automatic
  - Overhead
  - Radius
- Basket Storage
- Power Needs
- Connectivity



# Identify Needs

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## The BIG Idea

- Retractable Shopping Basket
  - Retrofit existing power chairs
  - Baskets in rear for storage/transport
  - Rails provide greater foot protection
  - Store lights, horn, electronics
- Armrest Monitor
  - GPS/maps
  - Emergency
  - Battery life
  - Speed

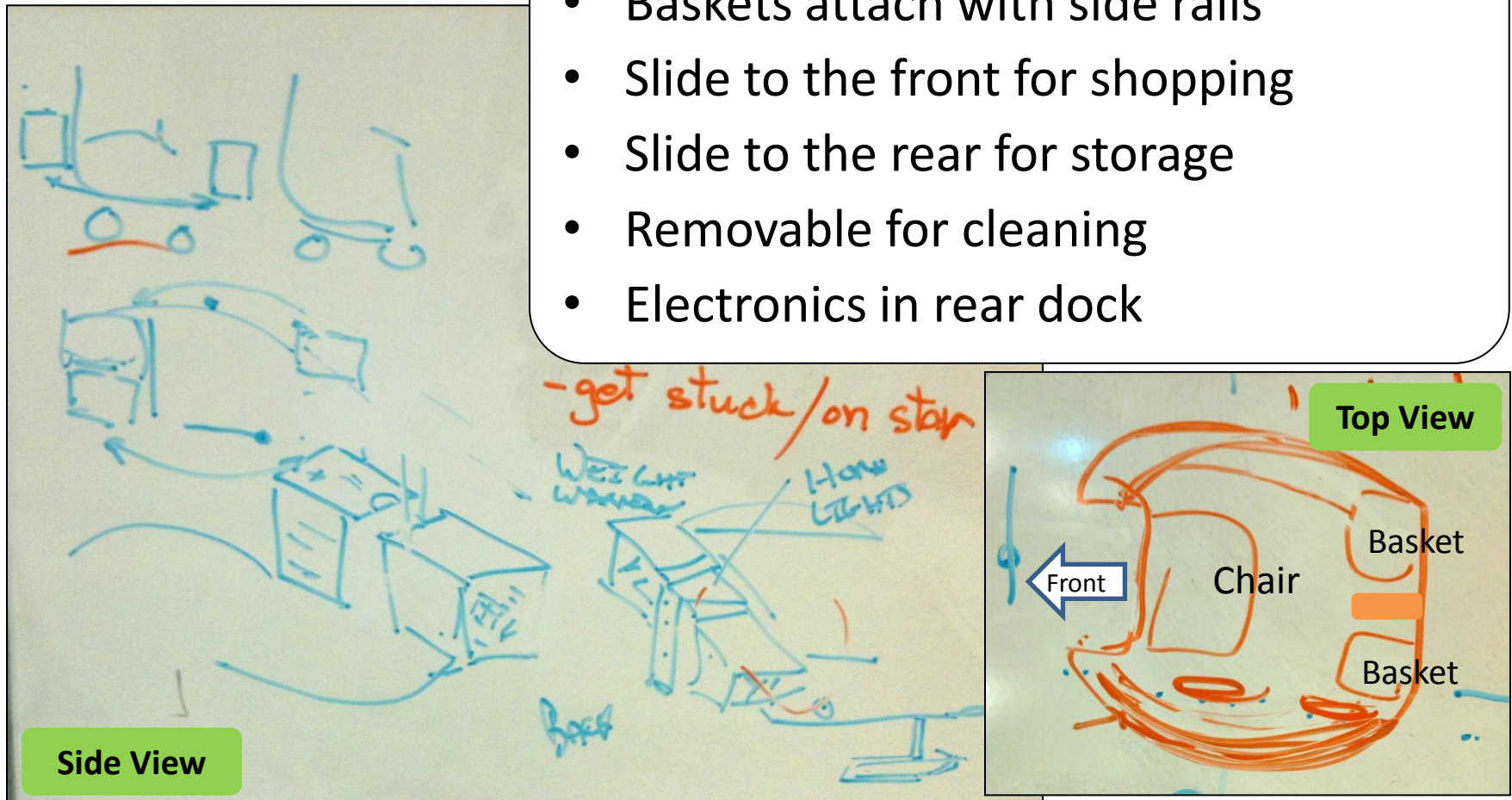




# Offering

## Retractable Shopping Baskets

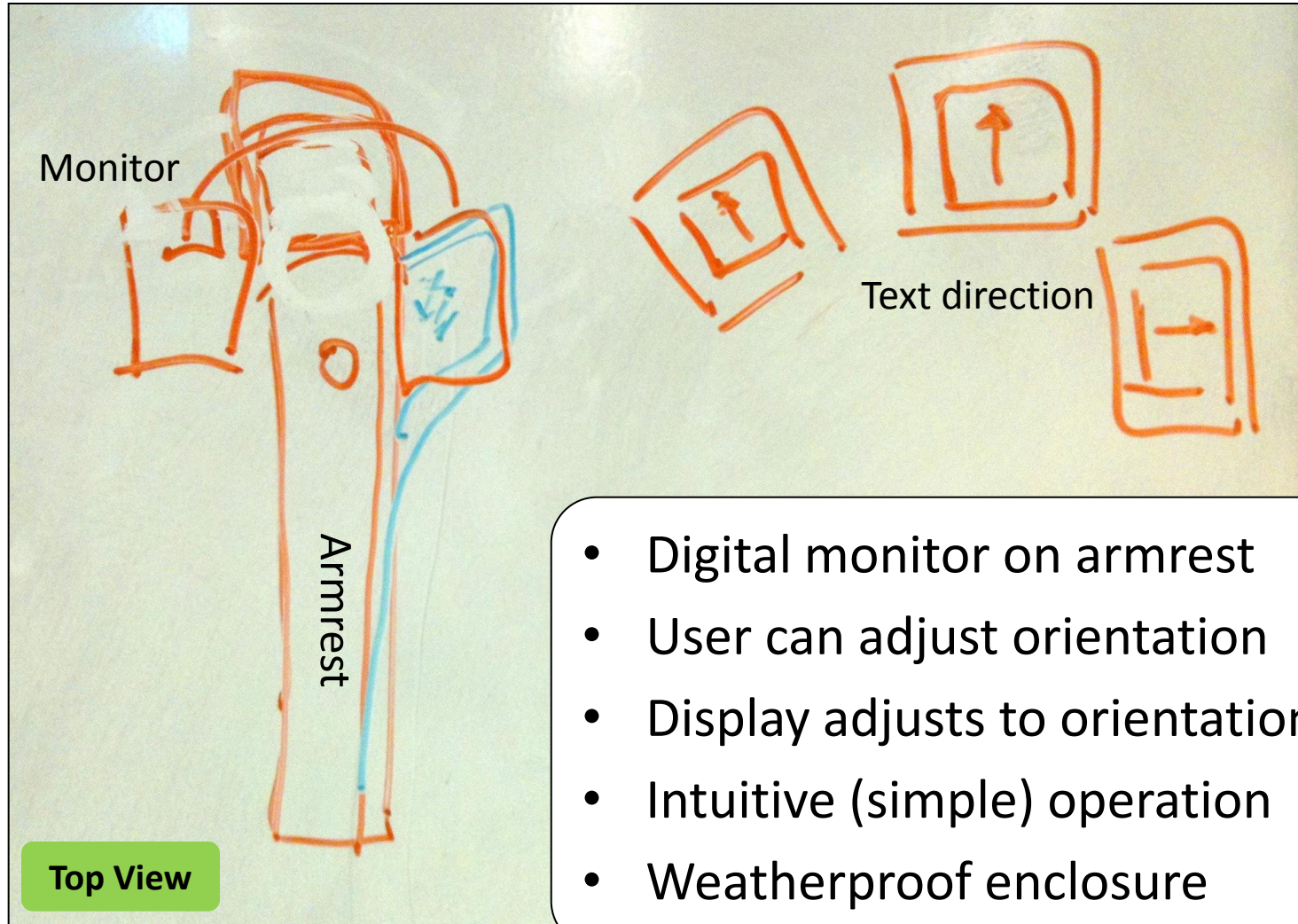
- Split (50/50) basket design
- Baskets attach with side rails
- Slide to the front for shopping
- Slide to the rear for storage
- Removable for cleaning
- Electronics in rear dock





# Offering

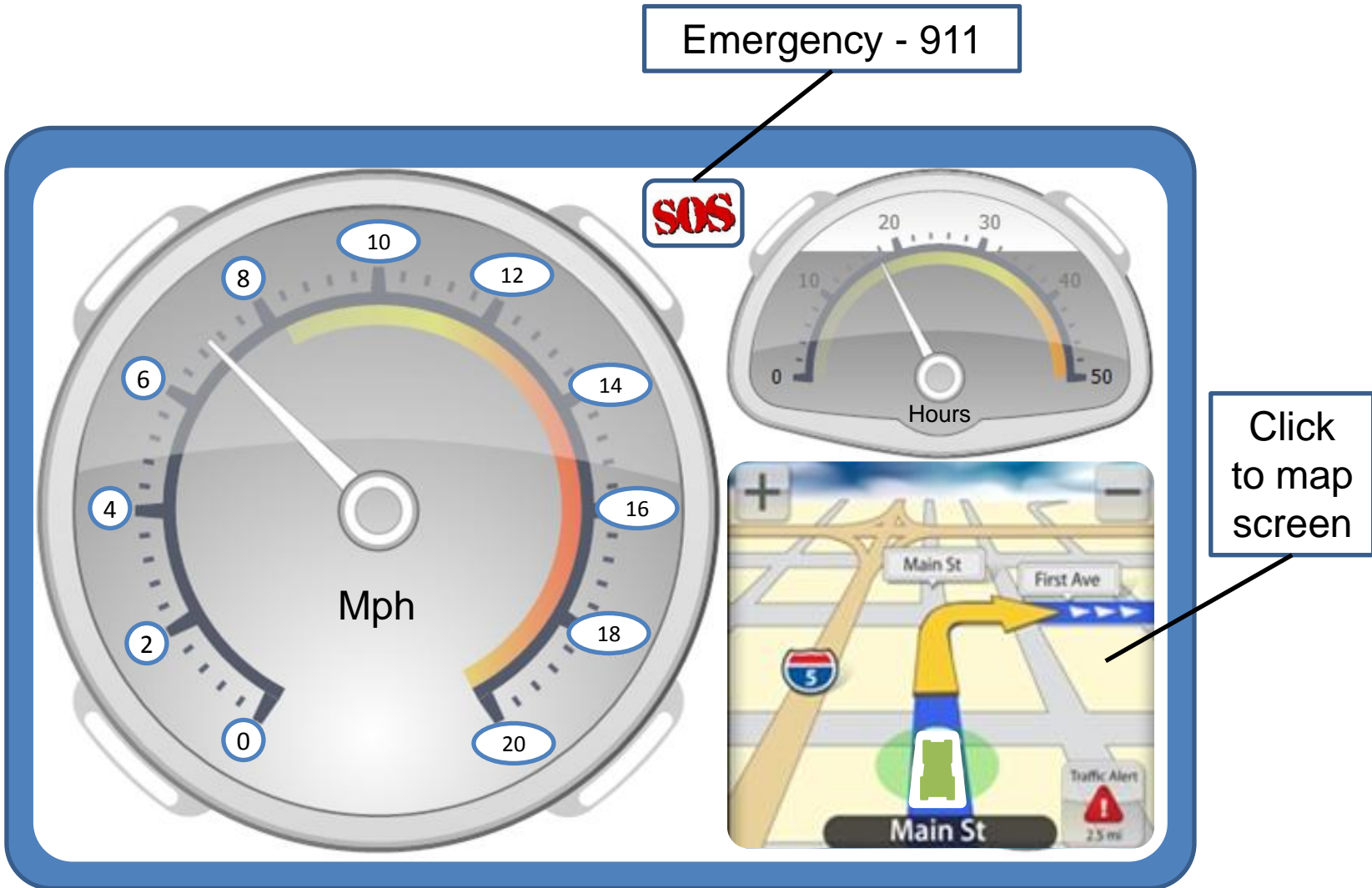
## Armrest Monitor



- Digital monitor on armrest
- User can adjust orientation
- Display adjusts to orientation
- Intuitive (simple) operation
- Weatherproof enclosure

# Offering

## Armrest Monitor



# Offering Armrest Monitor

Zoom In

Zoom Out



Home Menu

# Conclusion

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## Poetry in Motion

- Growing market need
- Existing solutions have limitations
- Opportunity enhance experience
  - Convenience
  - Comfort
  - Safety
  - Style
- Elegant Solution Identified
- We're Ready to Roll!!!



# Question

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# Back Up

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## Customer Voice

### Person 1

I used walker before, then I got this car from my health care. .. I need to maintain it by myself. The car cost \$4000...Every 5 years, I can get a new battery...I can recharge battery anywhere as long as there is a outlet...Battery can last for 6 hours every full recharge... when I entry to the place, sometimes I could not open the door.....

**Observation:** The chair is black leather seat and red body...  
Side mirror missing

### Interpretation:

- The chair need to have clear indicator for battery
- The chair need to be able to access the place
- The chair need to allow user to carry stuff
- The chair allow user to bring power cord easily
- The battery can last at least 5 years
- The color of chair body can be customized
- The color of seat can be customized (size and softness)
- The material of seat can be customized



# Back Up

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## Customer Voice

### Person 2

I got this chair from health care...This chair is \$8000...I paid 20% of total price for it...I have both a scooter and a chair...but I use Chair often...Scooter is not as stable as chair....I used scooter when I go to get a pack of beers...because I won't be able to bring it with chair..The basket is on the back of the chair...Otherwise, I have no problem with using chair...I can get around house, street ...The battery is lasting long enough...I won't go anywhere without this chair...But I do need to be careful Not to run over people's feet...Also I could not take chair with me when I fly somewhere...Airline asked me to take chair apart....I rented it when I visit other place....For safety, I think a horn and light would be good..I attached a small light on the side by myself... If it is raining, I need to protect the control board from getting wet.

**Observation:** The chair is black leather seat and black body

### Interpretation:

The chair need to allow user to carry stuff

The chair need to be able to take apart and fabricate

The control board can be protected from getting wet or being destroyed

The chair need to have louder horn Or other device to warn people

The chair need to have lights

The color of chair body can be customized

The color of seat can be customized

The material of seat can be customized

# Back Up

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## Customer Voice

### Person 3

My medical insurance paid for the chair I waited for 14 months to get this chair...Every 5 years I can get a new chair...I need to be careful where I go and the way I ride it...I need a chair that can handle 400 lbs...This chair can only handle 250 lbs...but I am getting heavier. I can run 22 miles after I fully charge the battery and I have power cord with me...I think the head light and reflector are good...the horn is not loud enough...

**Observation:** The chair is black leather seat and red body...The seat looks too small for him... He has his backpack at the back of the chair.

### Interpretation:

The chair need to have clear indicator for miles

The chair need to have reflector

The chair need to have louder horn Or other device to warn people

The chair allow user to bring power cord easily

The chair need to have lights

The color of chair body can be customized

The seat is adjustable

The color of seat can be customized

The material of seat can be customized

# Back Up

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## Customer Voice

### Person 4

The chair is very convenience except going through stairs and sometimes not able to open the door...I got it from medical care for free... I can recharge battery anywhere...I charge the battery everyday...It is not easy for me to do house work...

**Observation:** She has a lot of bags hanging on the back of chair...The chair is black leather seat and red body  
She has a backpack at the back of the chair

### Interpretation:

- The chair need to help user to go through stairs
- The chair allow user to bring power cord easily
- The chair need to allow user to carry stuff
- The chair needs to allow user to reach their stuff
- The chair can allow user to do work easily
- The color of chair body can be customized
- The color of seat can be customized
- The material of seat can be customized

# Back Up

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## Convenience:

- The chair need to have clear indicator for battery
- The chair need to be able to access the place
- The chair need to allow user to carry stuff
- The chair allow user to bring power cord easily
- The chair need to be able to take apart and fabricate
- The control board can be protected from getting wet or being destroyed
- The chair allow user to bring power cord easily
- The chair need to help user to go through stairs
- The chair needs to allow user to reach their stuff
- The chair can allow user to do work easily

## Style:

- The color of chair body can be customized
- The color of seat can be customized

## Safety:

- The chair need to have louder horn Or other device to warn people
- The chair need to have lights
- The chair need to have reflectors

## Comfort:

- The seat is adjustable
- The material of seat can be customized