

The Step'N Stash

Team 4
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Agenda

01

Design Challenge

User description & secondary research

02

Design Description

Discussion of materials & design parts

03

Design Rationale

User testing & research

04

Future Development

Limitations & further testing



01

Design Challenge



An Easier Way to Transfer (floor-wheelchair)

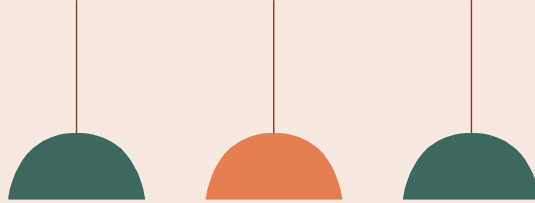


- Very straining and difficult process at home for users w/ spinal cord injuries
- Many don't have the strength to do this
- Can't be done even with a caretaker to help

Difficulty of Transfer



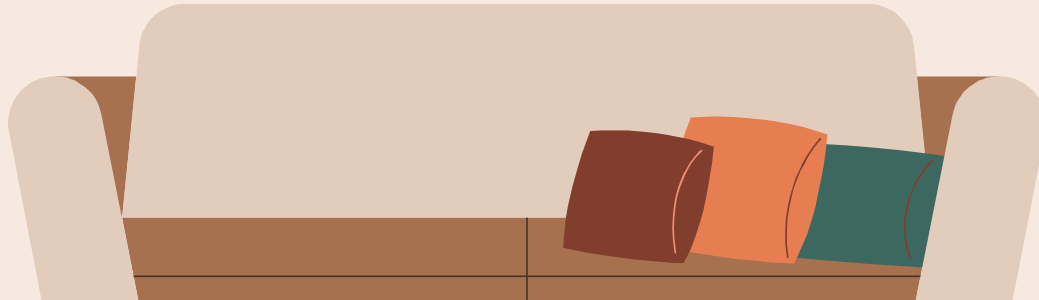
- Significant strain
- Takes a lot of technique and strength
- Often can't be done independently, especially with older demographics



Mission

Design a device that:

- Allows for safe and easy transfers
- Is portable within the house
- Blends seamlessly with home decor



02

Design Description

Discussion of materials &
design parts



Focus

Increase Increment

Decrease shoulder strain



Storage

Easily put away



Portability

Ease of transport in one's home



Aesthetics

"Homey" feel



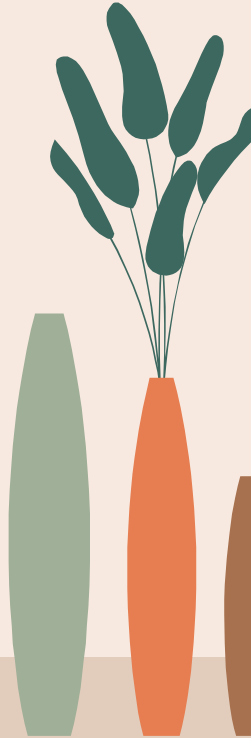
Increase Increment

- Four steps in total
- Top step are part of the housing
- Bottom three can collapse into itself and pulled out as needed



Storage

- The bottom step being collapse into itself saves horizontal space
- Can be put aside like one of the furniture when not in use



Portability

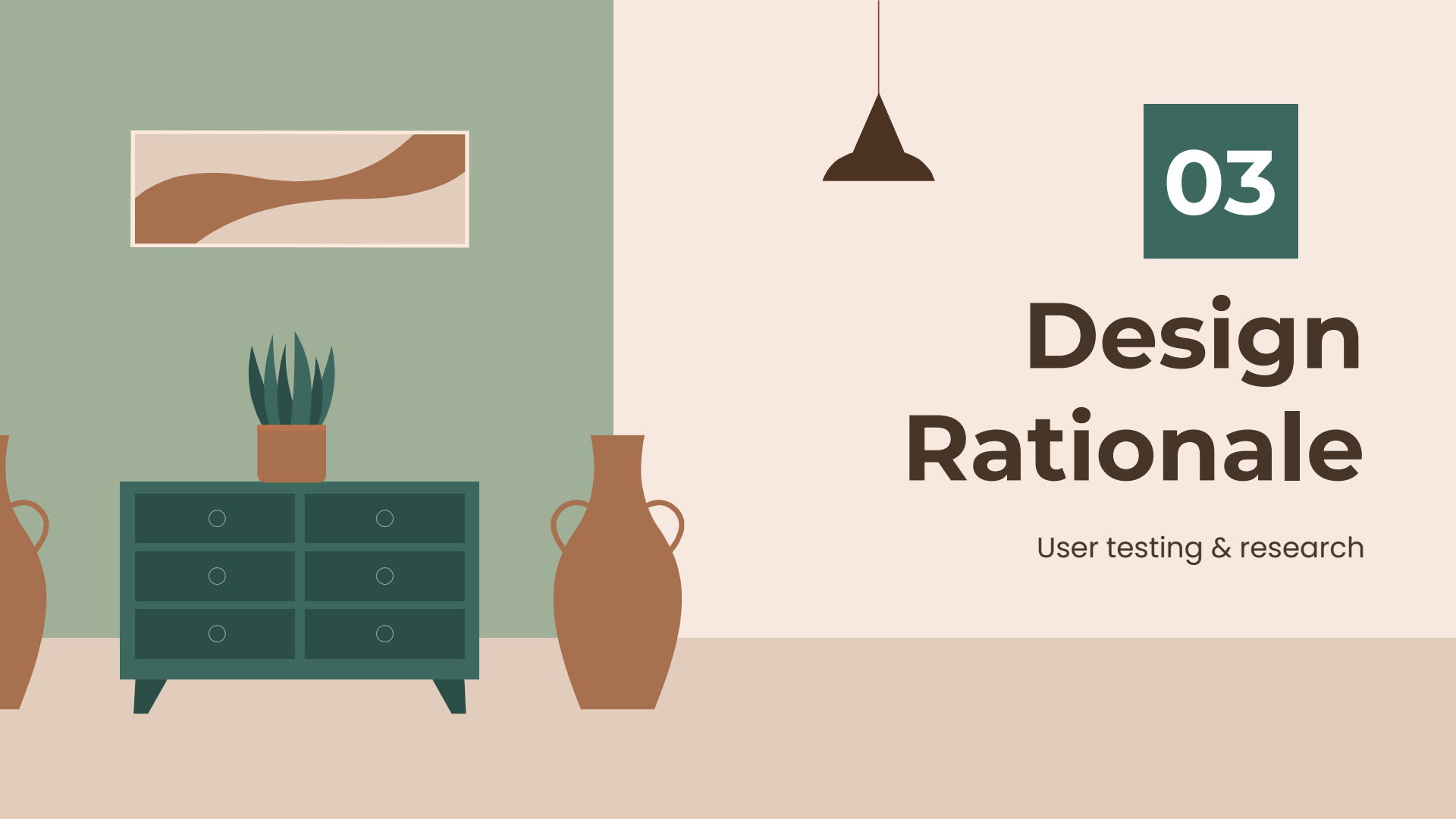
- The wheel on the bottom makes ground contact when tilted in an angle
- Hole handle for users to grab into when transporting



Aesthetics

- Blend in within the home without standing out as a medical device
- The device's wooden texture adds a feel of homeliness to it





03

Design Rationale

User testing & research

Mock Up Testing



Mockup Testing Conclusions



Independence

- Too heavy to set up independently
- Requires aid of caregiver



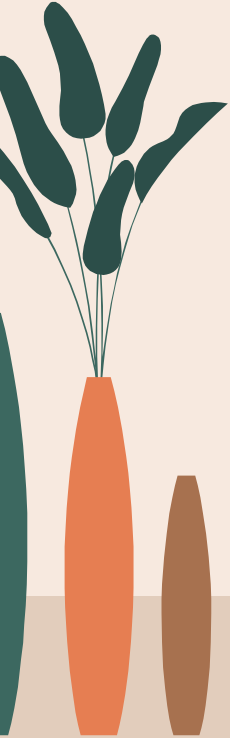
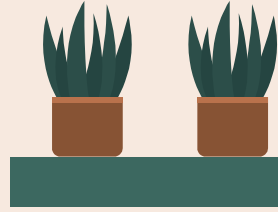
Caregiver

- Not considerate of older caregivers
- Must bend over/ Back strain



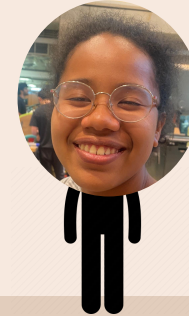
Comfortability

- The stair edges get caught on clothing
- Slipping
- Edges jabbed into skin



Demo: General Users

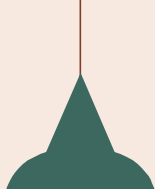
- Caregiver Role:
 - One fully abled body person
- Wheelchair User Role:
 - Has full upper body capabilities
 - Cannot use their legs while testing prototype





Testing: Steps

1. Caregiver rolls out Step'N Stash for use
 - Wheels allow for easy transportation

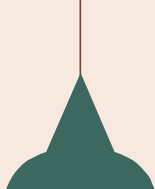


Testing: Steps

2. Caregiver pulls out steps using their foot

- Caregiver does not need to bend over
- Can use handles for stability



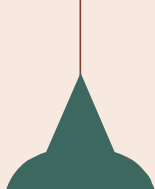


Testing: Steps

3. Wheelchair User uses Step'N Stash to get to the floor and back to their chair

- Rounded edges to reduce hazard of anything getting caught





Testing: Steps

4. Caregiver pushes steps in
& rolls the Step'N Stash into
its original position

- No need for hidden storage!

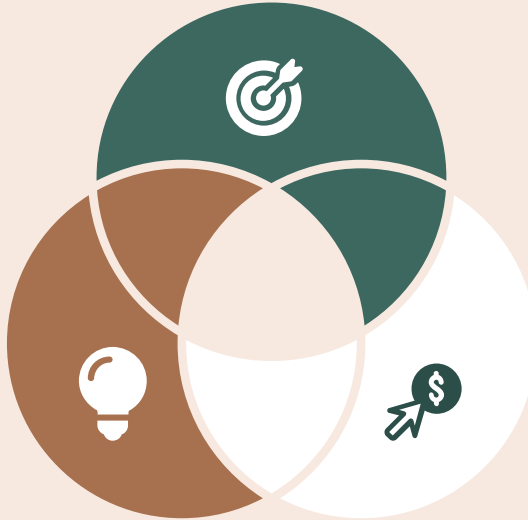




04

Future Developments

Future Developments



01

Target User &
Caregiver Feedback

02

Design
Modifications

03

Production



Target User & Caregiver Feedback



Safety

- Weight
- Movement
- Deflection



Comfort

- Bodily strain
- Ease of transfer motion



Aesthetics

- Color/Pattern
 - Size
- 

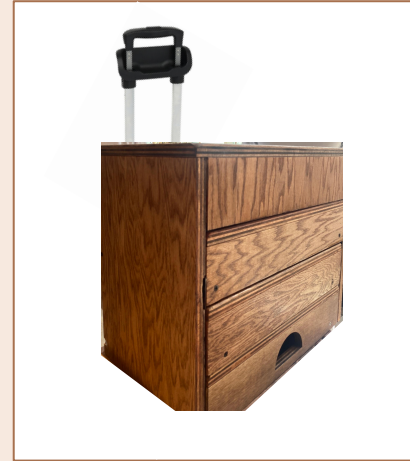
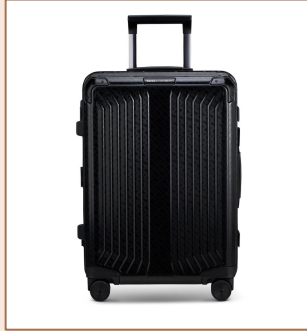
Design Modifications

1. Bigger foot hole



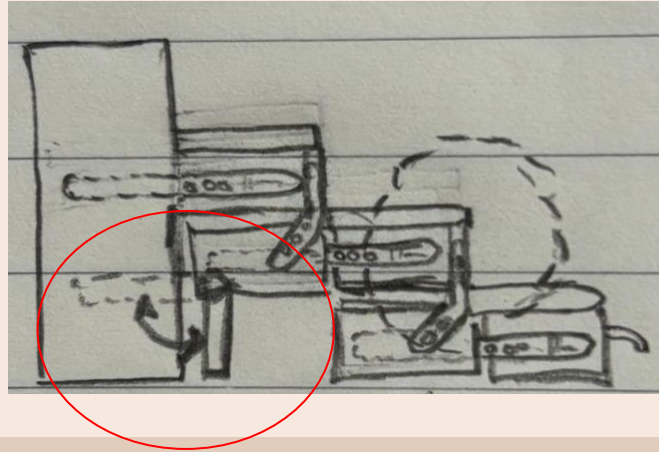
Design Modifications

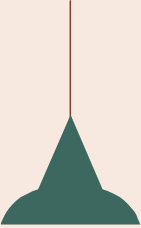
2. Addition of a “suitcase”/collapsible handle



Design Modifications

3. Weight Supports





Production

1 Price of Production

- Materials
- Assembly
- How do we lower?

2 Materials

- Product lifetime
- Customizable design
- Maximum weight
- Comfort

3 Affordability

- Access to low income populations
- 



Thank You

Do you have any questions?

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