

A photograph of a person's lower legs and feet standing on a rocky path. They are wearing light-colored cargo shorts, brown socks, and dark hiking boots. In the background, a majestic snow-capped mountain rises against a clear blue sky. A small orange rectangular frame highlights the area around the mountain peak.

REI FIT

Capstone Project Process Book

Table of Contents

<u>Team FIT Introduction</u>	3	<u>Design Iteration</u>	27
<u>Executive Summary</u>	4	Ideation Round 2	
<u>Introduction</u>	5	Fidelity Increase	
Problem		Prototype Refinement	
Design Questions			
Initial Research			
<u>Ideation</u>	10		
Sketching: Round 1			
Critique			
Sketching: Round 2			
Integration of Ideas			
System Mapping			
Wireframing			
Overview			
<u>Concept Testing</u>	19		
Initial Prototype Creation			
Prototype Overview			
Participant Recruitment			
Usability Testing			
Results Analysis			
Findings and Recommendations			
<u>Final Usability Report</u>	31		
Participant Recruitment			
Usability Testing Round 2			
Usability Results Analysis			
Final Usability Testing Findings			
Final Usability Testing Recommendations			
<u>System Overview</u>	38		
Our Solution			
Moving Forward with FIT			
<u>Lessons Learned</u>	43		
<u>Appendix</u>	45		
<u>Sources Cited</u>	46		
<u>Contact</u>	47		

Team FIT



Alec Martin

Alec especially enjoys the problem solving and ideation aspects of product design. He leverages a strong background in HCI and Interaction Design to create intuitive solutions that address pressing, real-world problems.



Xiaochen Yu

With a background in illustration, Xiaochen enjoys perceiving the world artistically. Through various projects in HCDE and her student designer position at school, she can't wait to see what she can bring to her communities using her design insights.



Tristan Shi

By reviewing and interacting with abundant existing systems and technologies, Tristan is keen on generating ideas, designing new features, and implementing products. He is a seasoned coder and prototyper.



Kirk Lestelle

Kirk is an enthusiast for powerful storytelling. His appreciation for different perspectives is what drives Kirk to design experiences that feel authentic to the unique needs and desires of the user audience.

Executive Summary

"Are you comfortable buying hiking boots online?" In general, people have a strong stigma against buying boots online without physically trying them on. There is a noticeable gap between the confidence level necessary in order to make a purchase and the information presented on boots' websites. With that in mind, REI came to us with a challenge -"How can we handle FIT better?"- in terms of using digital platforms to help customers choose hiking boots that fit their hiking experiences. Through the past two quarters, in partnership with REI, we designed a virtual fitting system - FIT - for customers purchasing boots on the REI website that successfully delivers the thoughtful and thorough fitting experience provided to customers in REI stores.

Adopting a user-centered design process, we performed in-store research within the hiking department to learn about the perspectives on this experience from REI customers and employees. After that, we jumped directly into design ideation and were able to do two rounds of design and testing. From there, we created the FIT system, which addresses **Personal Fit**, **Educating Users**, and **Creating Confidence**. The FIT system contains these three categories by providing an effective customer survey to accurately recommend the best product for their needs.

00 - Introduction

Problem

How do customers feel confident in the fitting of their newly shoes? When visiting a store, customers can feel how the shoes match their unique foot shape. They can discuss with experts how and where the shoes will be used. They can compare different products and learn how these products meet different needs and contexts. These are the moments involved in a fitting experience that create confidence in a customer's purchase. However, that is not the case when it comes to purchasing shoes online.

Current online shoe shopping experiences fail to highlight subtle, yet important differences between shoe models, brands, and types. This problem is further compounded when purchasing a specialty shoe type, such as hiking boots.

Design Questions

- “ What aspects of physical fittings for hiking boots can be brought to the digital world? ”
- “ What can be an effective way to address and present the concept of FIT on REI website? ”

Initial Research - Methods

Starting our process with an in-store field study, we headed to the REI flagship store in Seattle several times, and did semi-formal interviews with five REI employees who were knowledgeable about hiking boots. We also got the chance to talk with three REI customers about their former experience in purchasing hiking boots.

To gather a comprehensive understanding about customer's expectations in purchasing hiking boots, we interviewed eight individuals who recently purchased hiking boots from an online retailer.

Along with our field study and interviews, we also researched online about existing digital platforms used in the field of fitting.

Initial Research - Findings

Through interviews with REI customers and REI employees in the Seattle Flagship store, we learned that hiking boots have several unique challenges when it comes to fitting. Many of these challenges have nothing to do with the size of the boots, and require a certain level of expertise to navigate. In order to address this in physical stores, REI has created an in-store experience that generates trust and loyalty in their customers, especially REI members, by having resources aimed at helping customers navigate the fitting challenge. The experience includes expert employees and free in-store alteration services.

With that being said, there are no existing digital platforms currently have a fitting experience that addresses any issues beyond the size of the hiking boots. [Brooks](#) and [Mizuno](#) are running shoe companies that have implemented personal fitting systems into their online experience to help customers self-analyze several characteristics that affect which running shoe fits them best. This is not surprising since manufacturers typically produce more rigorous data for running shoe characteristics than in hiking shoes.

01 - Ideation

Sketching: Round 1

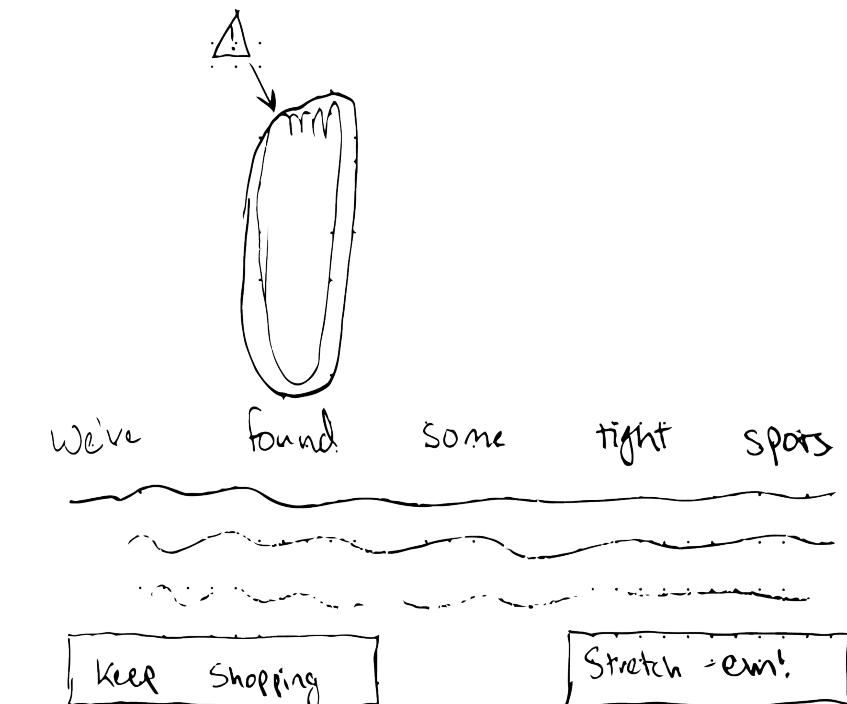
Method

Team members split off and individually sketched a minimum of 2 unique design directions based off of our initial research. Sketches ranged from feature-level to system level in scope, and were extremely low fidelity.

Output

An extremely diverse pool of possible solutions from which to base the design of our system going forward.

Here's your fit!



Critique

Method

Each individual group member explained their sketches and rationales behind them. Other group members took notes, asked questions, resonated with the ideas, and contributed new ideas during the process.

Output

After the critique session, all group members gained new impressions on the problem by being exposed to what others ideated, and were ready to generate more robust solutions.

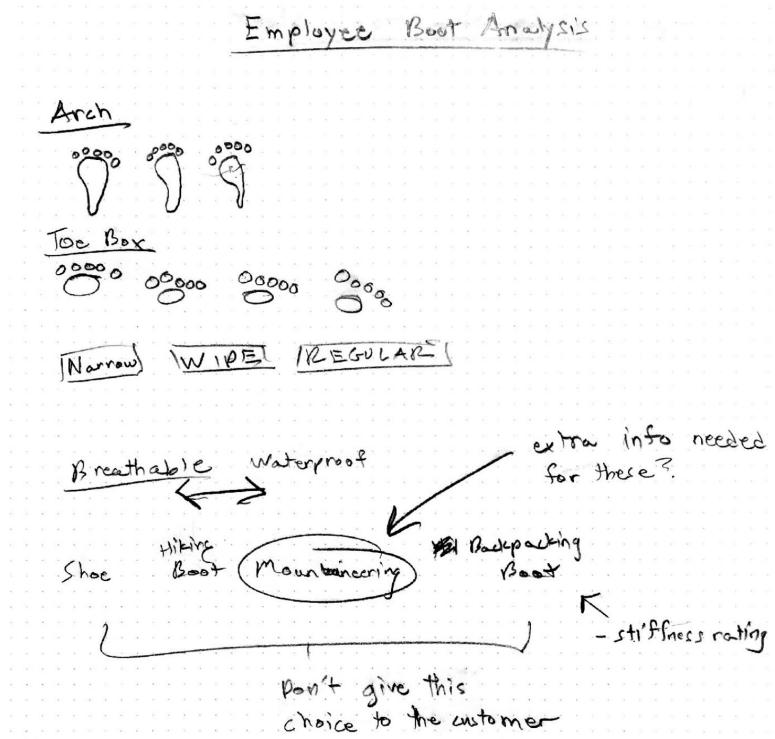
Sketching: Round 2

Method

Similarly to our first round of sketching, each team member individually created a set of sketches outlining several unique approaches to solving the design problem. Some of these new sketches were evolutions or combinations of ideas from our group critique, and some were completely new ideas. Sketches remained at low-fidelity.

Output

A much more focused, coherent pool of ideas to inform the design of our system going forward.



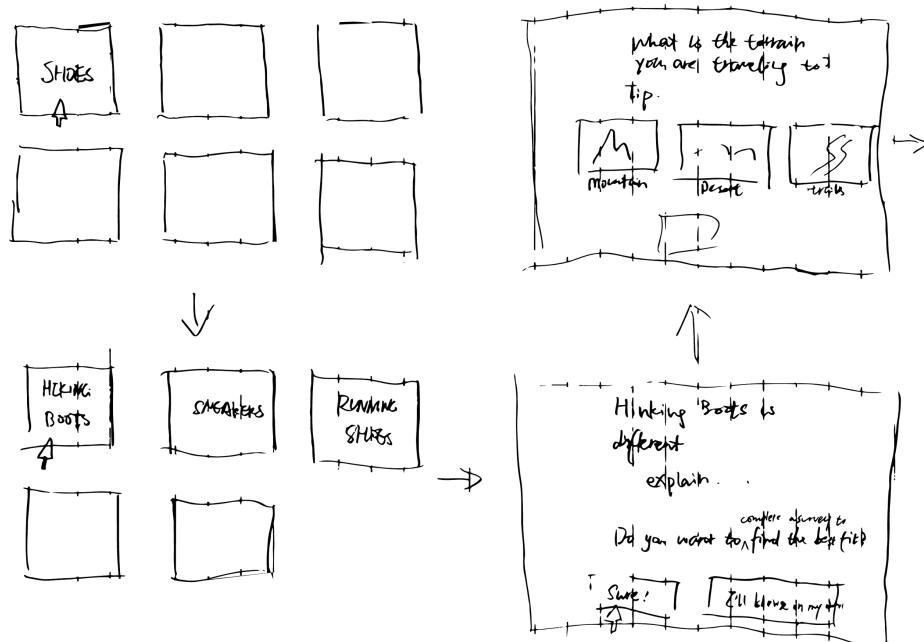
Integration of Ideas

Method

During a second, much more focused critique session, we combined and tweaked our second round of team sketches into a single, coherent system concept. At this point in the process we stopped designing as individuals, and began collaborating on all aspects of the system design as a team. The session lasted about 4 hours, and during that time the best concepts from each designer's sketch pool were combined to create a basic, high-level overview of how we planned to address our design problem.

Output

High-level design spec.



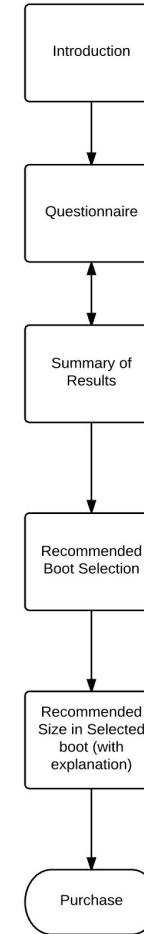
System Mapping

Method

Using our high-level design spec, we created a system map to describe the general flow a user would go through when interacting with our system. This was the first step in taking our project from a concept to a real, usable system.

Output

System map diagram.



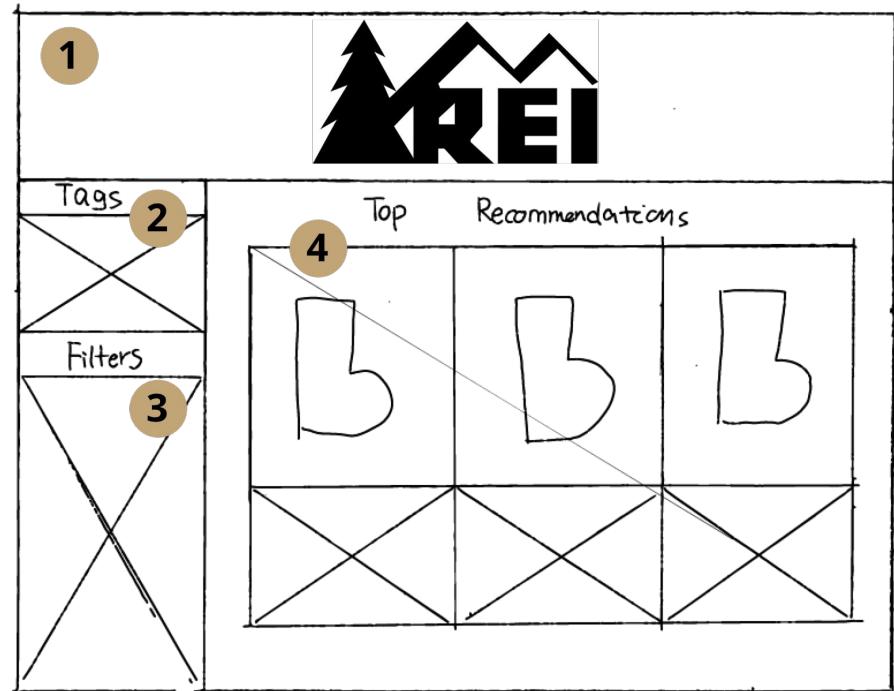
Wireframing

Method

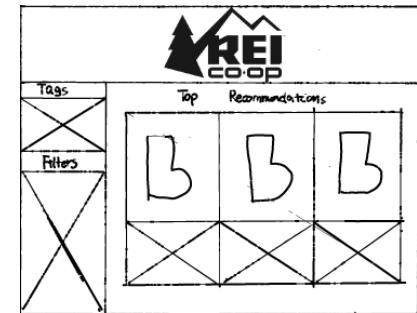
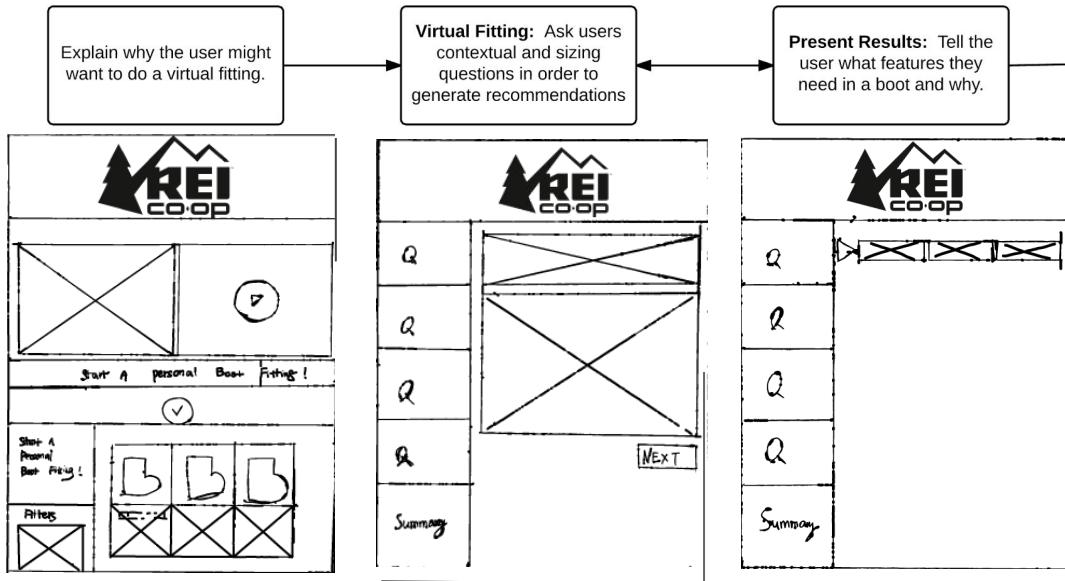
Working step by step through the system map, we designed screens and features as a group in a single, 4 hour whiteboarding session. These whiteboard sketches were then recreated as wireframes on paper and digitally annotated to describe the behavior of elements. These wireframes served as the initial version of our complete system.

Output

Annotated Wireframes



Wireframing Overview



Initial Design Overview

Our Idea is to bring the confidence of an in-store purchase to the online experience. In order to achieve this goal, we designed a hiking boot user flow that mirrors an in-store fitting every step of the way. During our research, we found that **expert advice, intelligent and individualized recommendations, and in-store trial** were the main contributors to customer confidence and satisfaction. Though it may not be possible to reproduce these perfectly in a virtual setting, our user flow makes every effort to include these key elements of a successful and enjoyable fitting.

02 - Concept Testing

Initial Prototype Creation

Method

Based off the system map and the final sketches we developed during the ideation phase, our team adopted Axure RP 8 to create an interactive prototype in order to test our concept with potential users.

Output

A medium-fidelity Axure prototype with limited interactivity, deployed to Axure server.

The image shows a medium-fidelity Axure prototype for determining toe box shape. The interface is designed to look like the REI co-op website. On the left, there is a sidebar with filters: LOCATION (Snoqualmie), TYPE OF HIKING (Light Backpacking), HIKING STYLE (More Aggressive), TOE BOX (selected), FOOT WIDTH, ARCH HEIGHT, INSTEP HEIGHT, and SUMMARY. The main content area has a heading "What is your toe box shape?" followed by a subtext: "Every model of hiking boot has a different toe box shape. We'll find the boot that best fits your foot shape!". It then displays five foot silhouettes with arrows indicating the toe box shape: Tapered, Peasant, Greek+Tapered, Greek+Square, and Square. A blue "NEXT" button is located at the bottom right.

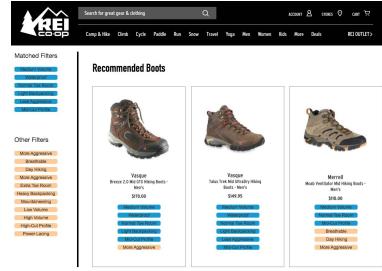
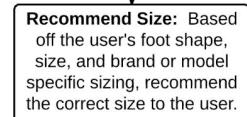
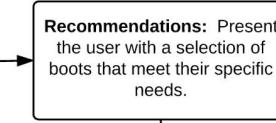
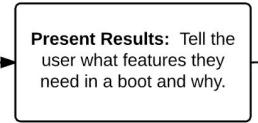
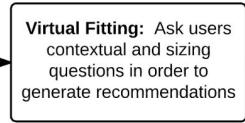
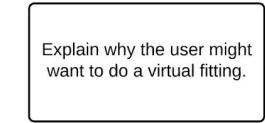
Prototype Overview

Introductory video on top of the landing page

Questionnaire to gather personal fitting data from customers

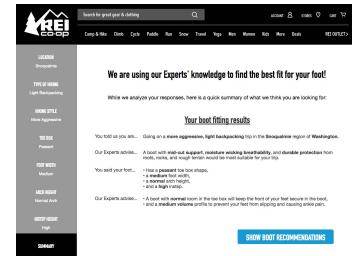
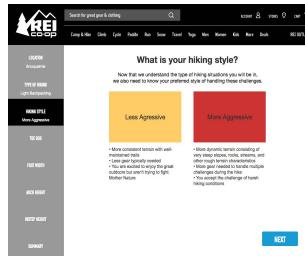
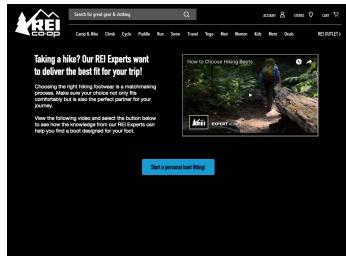
Display fitting results on the same page as the questionnaire

Show customers their recommended boots with in-depth descriptions



Purchase

Not included



Participant Recruitment

Method

To recruit participants, we distributed a short questionnaire on several UW hiking club Facebook pages.

Output

From that screener questionnaire, we scheduled 5 half-hour sessions. Unfortunately, only 3 participants showed up. To make up for this, we conducted two sessions with participants known personally to our team, who have experience with hiking and purchasing hiking boots.

Alec Martin April 17

Hey everyone! My HCDE Capstone team is working with REI to help improve their online hiking boot fitting experience. We have some early prototypes of a pretty cool concept that we're hoping to test with some potential users next week. If you're available/willing to help us out for about a half hour on campus next week, we'd really appreciate it! (and buy you coffee/snacks). If interested, please fill out this quick, 5 minute survey. Thanks!

REI FIT Usability Survey

*Required

Do you currently own hiking boots/shoes? *

Yes
 No

REI FIT Usability Survey

DOCS.GOOGLE.COM

Like Comment Share

Usability Testing Round 1

Method

During test sessions, we used Lookback.io to record on-screen interactions as well as conversation. These recordings were used to take notes on study sessions after the sessions had ended.

The documentation we used during our usability test sessions includes the general script, the use case scenario, the consent form, and a post-test questionnaire.

Output

Verbal protocol - the think-aloud process performed by the users as they progressed gave us a window into their mindset and mental models surrounding the process.

Interviews - Post-test questionnaires allowed us to confirm points of confusion with the prototype, and these sticking points will allow us to prioritize system changes.

Usability Test Results Analysis

Method

We performed an affinity diagramming activity with the information gathered during our 5 usability sessions, in order to pull out themes and recurring issues.

Output

5 common themes + positive feedback.



Concept Testing Findings

Stigma Against Buying Online - 4 out of 5 participants mentioned that information on current websites didn't provide enough information to make them confident in a boot purchase.

Instep Confusion - 4 out of 5 participants were not familiar with their instep height and weren't able to determine it effectively using the graphics we provided.

System Feedback - All 5 participants thought the system might be malfunctioning because they were not able to see that the system registered their answer inputs (clicks).

Misconceptions and Previous Experience - Multiple participants were able to answer our more complex questions quickly because they "knew" the information being asked from prior fittings. The accuracy of this knowledge, however, is uncertain.

Tag Confusion - 2 out of 5 participants had trouble understanding some tags we presented on our boots recommendation page and doubted the connections between the contents on the questionnaire result page and the tags.

Concept Testing Recommendations

Stigma Against Buying Online - Be thorough and transparent with users at each step of the process, so that they know exactly what is being recommended and why.

Instep Confusion - Find a more effective way to explain what instep height is, why it is important, and provide a way to objectively measure it.

System Feedback - Add some sort of system feedback to ensure the user that their input has been received. One option would be to make the “Next” button grayed out and disabled until the user makes a selection.

Misconceptions and Previous Experience - We will stress the importance of accurate measurements, and encourage users to measure themselves thoroughly rather than rely on past experience.

Tag Confusion - Address the boots fitting results from the previous summary page as references to show more connections between the their answers and the tags.

03 - Design Iteration

Ideation Round 2

Method

We conducted an abbreviated ideation round at the beginning of milestone 3, centered around the key findings that came out of our usability study. We collaborated on whiteboard sketches of possible solutions to each pain point or problem our participants encountered, paying close attention to how the proposed solutions would behave within the context of our system as a whole.

Output

Photos of our whiteboard sketching session, with detailed rationale behind each proposed system change, as well as a detailed changelog for proposed changes.

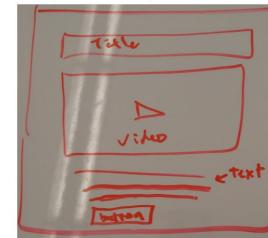
Please check off the changes you've made, and mark the impossible changes:

General:

- Button round corner removal
- All blue button highlight on hover
- Current question rect bgcolor white, text black
- Change sidebar rect green on option selected (RGB: 172, 202, 17) OR black bgcolor w/ green text to match the REI style
- Black unanswered question rects w/ grey text
- Reveal Next button once they select an option, hidden until then
- Border around the options with an icon and text on select
- TRY: left align the explanation text instead of centered
- Consistent font size hierarchy across pages(except for result & recommendation pages)
- Icon overhaul
- Keep the selected options highlighted
- Tooltips where needed

Landing Page:

- Title — Image — Description — Button to Survey
- Button highlight on hover (150, 194, 255)



Intro Page:

- Make Intro Video

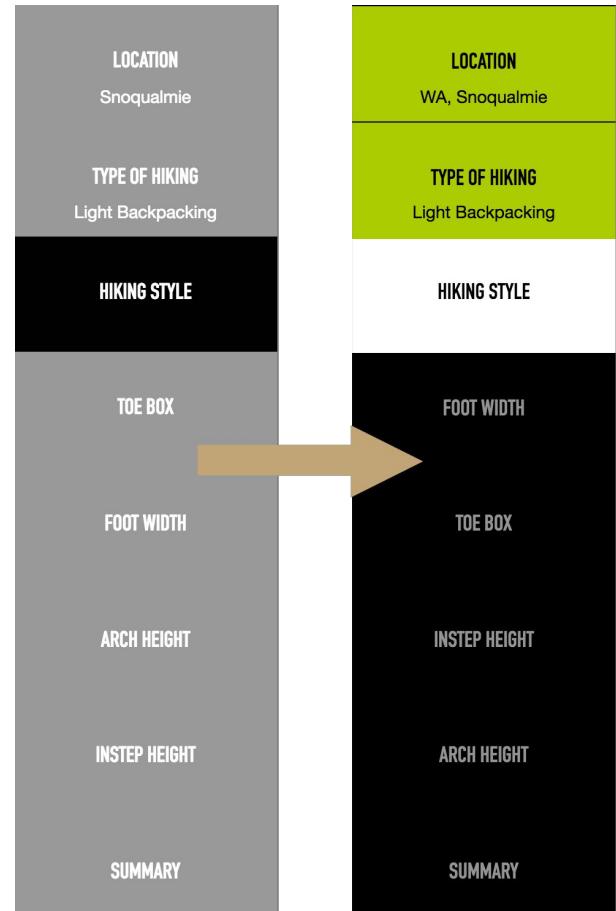
Fidelity Increase

Method

For version 2 of our interactive prototype, we wanted to make the system look and feel more like it belongs on REI.com. In order to accomplish this, we tweaked our color schemes, button shape and layout, highlighting, and animation to better match what REI.com currently looks like.

Output

More polished interactive prototype.



Prototype Refinement

Method

Utilizing Axure's team project functionality, we remotely made changes to our prototype until it fully reflected the functional changes outlined in our changelog.

Output

Interactive prototype that reflects the changes proposed in response to our Usability Study findings.

[See the prototype in action](#)

The figure consists of three side-by-side screenshots of an Axure prototype for REI. The first screenshot shows a 'Finding your Foot Width' page with a 'Hide Tutorial' button highlighted by a red arrow. The second screenshot shows a 'What is your foot width?' page with a large footprint graphic and three size options: 'Narrow', 'Medium', and 'Wide'. A red arrow points from the 'Narrow' option to the 'Show Tutorial' link at the top of the page. The third screenshot shows a 'Recommended Boots' page with a grid of three boot products. A brown arrow points from the middle boot's product card to the right, leading to a larger view of the same page where the boot details are more clearly visible.

04 - Final Usability Report

Participant Recruitment

Method

To recruit participants, we distributed the same short questionnaire on several UW hiking club Facebook pages as we used for the first round of testing.

Output

From that screener questionnaire, we scheduled five 30 - 40 minutes sessions. Unfortunately, one participant didn't show up. To make up for this, we conducted one session with a participant known personally to our team, who has experience with hiking and purchasing hiking boots.

Alec Martin April 17

Hey everyone! My HCDE Capstone team is working with REI to help improve their online hiking boot fitting experience. We have some early prototypes of a pretty cool concept that we're hoping to test with some potential users next week. If you're available/willing to help us out for about a half hour on campus next week, we'd really appreciate it! (and buy you coffee/snacks). If interested, please fill out this quick, 5 minute survey. Thanks!

REI FIT Usability Survey

*Required

Do you currently own hiking boots/shoes? *

Yes
 No

REI FIT Usability Survey

DOCS.GOOGLE.COM

Like Comment Share

Usability Testing Round 2

Method

During test sessions, we used Lookback.io to record on-screen interactions as well as conversation. These recordings were used to take notes on study sessions after the sessions had ended.

The documentation we used during our usability test sessions includes the general script, the use case scenario, the consent form, and a post-test questionnaire.

Output

Verbal protocol - the think-aloud process performed by the users as they progressed gave us a window into their mindset and mental models surrounding the process.

Interviews - Post-test questionnaires allowed us to confirm points of confusion with the prototype, and these sticking points will allow us to prioritize system changes.

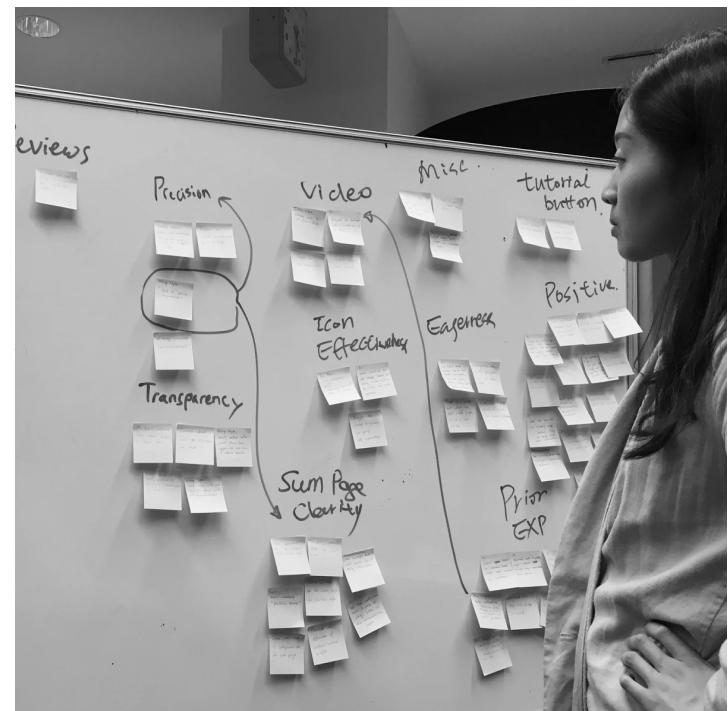
Usability Test Results Analysis

Method

We performed an affinity diagramming activity with the information gathered during our 5 usability sessions, in order to pull out themes and recurring issues.

Output

6 common themes + positive feedback.



Final Usability Testing Findings

Eagerness - Participants were really eager to get right to it and perform the measurements on their feet. This lead to users making incorrect measurements, and, in some cases, measuring the wrong part of their foot.

Prior Experience - Many participants tried to use their previous experience with shoe fitting in order to quickly select an option on the foot measurement questions.

Transparency in Answers Affecting Results - Multiple participants wished they could easily learn how each selection during the questionnaire was affecting their results and boot recommendations.

Precision - Participants preferred having actual ranges of measurements for them to choose from. They also reported that more precise descriptions of the concepts and terminologies would be helpful.

Summary Page Clarity - Participants appreciated the final page of the questionnaire that displayed both the answers they gave and the Expert recommendations that came from those answers. However, they still believed that the information could have been displayed better.

Tutorial Button - None of our 5 participants noticed the "Show Tutorial" button at the top of each question screen.

Final Usability Testing Recommendations

Eagerness - Put more emphasis on question and description text. By emphasizing the question text more prominently, we believe users would read the text in addition to looking at the diagrams. Another possible solution would be to show only the question text for a few seconds before showing the user the diagrams, in order to give them some time to read without any distractions.

Prior Experience - We need to find out the appropriate way to present our tutorial and description so that the users can utilize their prior experience for a faster virtual fitting experience. However at the same time, we need them to be aware of the misconceptions and inaccuracy they may have. One viable solution could be to semi-force the users to go through the tutorial, and educate them that their previous knowledge may be wrong if they chose to skip the tutorial.

Transparency in Answers Affecting Results - The selections in each question could have better descriptions to explain how different answers create different boot recommendations. This could be done successfully with better illustrations in each question that help the user understand the direct effect of their selected answers.

Final Usability Testing Recommendations Cont.

Precision - Although there is currently no standard measurement bounds for categorizing people's instep height, we can collaborate with REI fitting experts to find the correlation and establish our own standard. The description or tooltip for terminologies and concepts on our prototype can be improved by refining the wording of the sentences, as well as by incorporating more illustrations.

Summary Page Clarity - The summary of results could be separated with easier to understand language that shows the difference between questions about the context of the hike and questions about the characteristics of the user's foot. Unique keywords in the results should have a definition that can be quickly viewed if needed.

Tutorial Button - Increase the visibility of the "Show Tutorial" button. This could be accomplished in a variety of ways, but our team discussed two approaches in particular. First, the button could be moved from the top of the question area to the right hand border, and stretched to span the entire height of the question area. The second approach we discussed would be having the tutorial tray default to being open rather than closed for the first question in the questionnaire. This would assure that the user knows the tutorials exist, without forcing them to watch all of them if they don't want to.

05 - System Overview

Our Solution

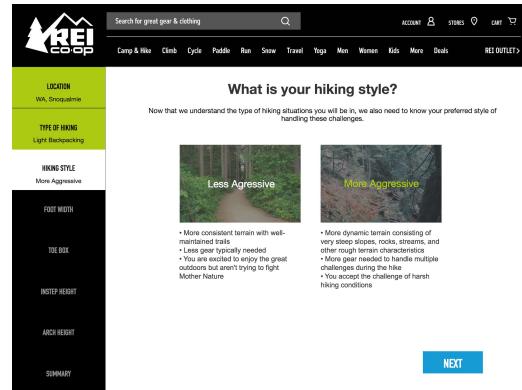
Through our design process, we found that the complexity of a positive boot fitting experience can be simplified into three critical categories:

- **Personalize Fit**
- **Educate User**
- **Create Confidence**

Our final design contains these three categories by providing an effective customer survey to accurately recommend the best product for their needs.

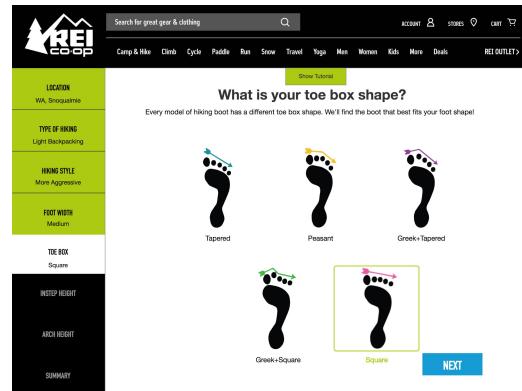
Personalize Fit - Context

The user begins by answering some questions about their intended context of use for the boots. These questions help the system determine what boot type and features the user needs.



Personalize Fit - Foot Shape

The user is then asked to answer questions about their foot shape. This helps determine what size and shape boot the user needs. Tutorials are offered to help the user quickly obtain accurate measurements.



Educate User - Summarize

The system then explains back to the user what information it has gathered, and how that information translates into recommended features. The user can go back and change their answers if they wish, and continue to the recommendation page when ready.

The screenshot shows a REI Co-op product page for boots. On the left, a sidebar displays the following user inputs:

- LOCATION: WA, Snoqualmie
- TYPE OF HIKING: Light Backpacking
- HIKING STYLE: More Aggressive
- FOOT WIDTH: Medium
- TOE BOX: Square
- INSTEP HEIGHT: Medium
- ARCH HEIGHT: Normal Arch

Below this is a "SUMMARY" button. To the right, a section titled "We are using our Experts' knowledge to find the best fit for your foot!" provides a quick summary of the user's trip details and boot recommendations:

You told us you are... Going on a more aggressive, light backpacking trip in the Snoqualmie region of Washington.

Our Experts advise... A boot with mid-cut support, moisture wicking breathability, and durable protection from roots, rocks, and rough terrain would be most suitable for your trip.

You said your foot... • Has a Square toe box shape.
• Is medium width.
• Has normal arch height.
• And a medium instep.

Our Experts advise... • A boot with extra room in the toe box to prevent your toes from blistering.
• And a medium volume profile to prevent your feet from slipping and causing ankle pain.

A blue "SHOW BOOT RECOMMENDATIONS" button is located at the bottom right.

Create Confidence - Recommend

The system then gives the user a selection of 3 boots. The blue tags attached to each explain what features from the questionnaire are included in the boot, and the orange tags explain any additional features the boot has.

The screenshot shows a REI Co-op product page for recommended boots. On the left, a sidebar lists the "Critical Features" included in the recommended boots:

- Medium Volume
- Waterproof
- Normal Toe Room
- Light Backpacking
- Less Aggressive
- Mid-Cut Profile

Below this is an "Additional Features" section:

- More Aggressive
- Breathable
- Dry Fit Hiking
- More Aggressive
- Extra Toe Room
- Heavy Backpacking
- Mountaineering
- Low Volume
- High-Cut Profile
- Power Lacing

Three boots are displayed in a grid:

- Vasque Breeze 2.0 Mid GORE-TEX Hiking Boots - Men's**: \$100.00
Includes: Medium Volume, Waterproof, Normal Toe Room, Light Backpacking, Mid-Cut Profile. Additional: More Aggressive, Breathable, Dry Fit Hiking, More Aggressive, Extra Toe Room, Heavy Backpacking, Mountaineering, Low Volume, High-Cut Profile, Power Lacing.
- Vasque Talus Mid GORE-TEX Hiking Boots - Men's**: \$145.00
Includes: Medium Volume, Waterproof, Normal Toe Room, Light Backpacking, Mid-Cut Profile. Additional: More Aggressive, Breathable, Dry Fit Hiking, More Aggressive, Extra Toe Room, Heavy Backpacking, Mountaineering, Low Volume, High-Cut Profile, Power Lacing.
- Merrell Moab Ventilator Mid Hiking Boots - Men's**: \$100.00
Includes: Medium Volume, Waterproof, Normal Toe Room, Mid-Cut Profile. Additional: Breathable, Dry Fit Hiking, More Aggressive.

Moving Forward with FIT

REI Expert Knowledge Database

In order to build the database containing all of the appropriate information for each hiking boot, we believe that REI Experts at multiple REI locations could record the contextual and foot characteristics that are unique to each boot.

Customer Profile Recommendations

REI customer engagement could be improved with this fitting survey by saving their answers into a customer profile that can be used to easily recommend future boot purchases or other products.

FIT Experience in Other Products

Online purchasing experiences for other products (e.g. bikes, running shoes, ski boots) could also implement their own fitting survey to give accurate recommendations to online shoppers.

06 - Lessons Learned

Lessons Learned

We have learned a ton over the course of this project, and if we were to take on a project of this scale again there are a few things we would do differently.

Conduct more sessions for usability testing

Recruiting participants is hard, especially on a tight timeline. With that being said, we really would have liked to have the opportunity to test with just a couple more participants for each test phase. While we were able to get extremely valuable information from the participants we worked with, we didn't quite feel like we were able to reach full saturation.

Record the process - take pictures, take notes on every meeting

We learned quickly that there is no such thing as too much documentation. If we were to start from the beginning, we would take a lot more pictures, notes, screenshots, etc. in order to help us more clearly communicate our ideas, process, findings, and progress to our peers, users, and sponsor.

It's always good to start early, as we did

Appendix

Milestone 1: Ideation

Milestone 2: Concept Testing

Milestone 3: Design Iteration

Milestone 4: Final Usability Report

Project Video

Project Poster

Prototype in Action

Cited Sources

Number of participants in hiking in the United States from 2006 to 2015 (in millions). (2016). Retrieved June 7, 2016, from <http://www.statista.com/statistics/191240/participants-in-hiking-in-the-us-since-2006/>



Contact

amartin1@uw.edu
kirklest@uw.edu
cechishi@uw.edu
xc1994@uw.edu



A photograph of a majestic snow-capped mountain range under a clear blue sky. In the foreground, the lower legs and boots of a hiker are visible, standing on a rocky path. A thin orange line forms a rectangular frame around the top left corner of the image.

Thank You!

Designed by Team FIT

A Project Sponsored by

