




— — —

SCREW IT

Home Improvement

POVs, HMWs, and Experience Prototypes



CMPSC 185 || Annika Damstedt, Hannah Zhang, Krystelle Baluyot



Meet the Team



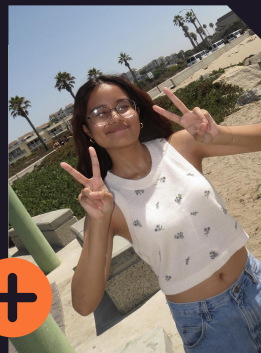
Annika Damstedt

'27
Computer Science



Hannah Zhang

'27
Computer Science



Krystelle Baluyot

'27
Computer Science



01

Narrowing the Scope

— — —
Finding a more specific
project domain



Original Domain

What are skills that all adults have to use?

What is an area we would like to learn more about?



Home/Car Maintenance!

What do people not enjoy doing but would benefit from learning how to do?

Where does information break down in practice?

Domain Refinement

No one was interested in car maintenance

People were more interested in learning home renovations



Home Improvement!

Everyone thought learning home maintenance was important, but boring.

What combines home maintenance and home renovation?



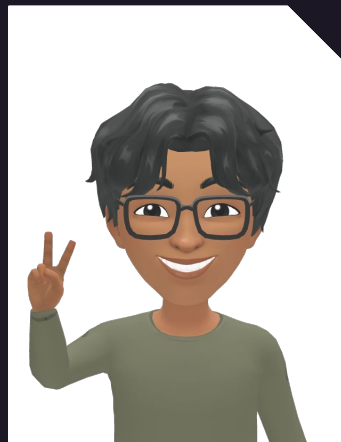
Key Learnings from GR1

- **Home maintenance knowledge exists on a spectrum**
 - Interviewees ranged from a home renovation company employee to a renter with minimal home maintenance experience
- **Many existing resources are too generic**
 - Interviewees reported relying on Youtube videos and instruction manuals, but the information they gathered often didn't apply to their own homes
- **Practice builds confidence**
 - Interviewees reported more willingness to learn home maintenance after completing a few manageable tasks





New Participants

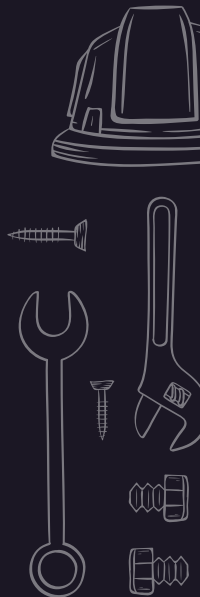


B.A.

UCSB student (19), renting a studio apartment, lives by himself

D.D.

Retired construction worker and woodworking teacher



Interview 1



“Most of the time it’s better to do it yourself.”

— B.A.

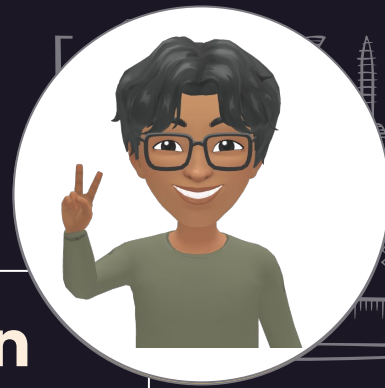
Team member roles:

- **Interviewer:** Krystelle Baluyot
- **Recorder:** Hannah Zhang

Location: In person
(UCSB Library)



Analysis



01 Insights

- Finances come into play when wanting to personally do home improvements
- Customization makes living space feel homey and satisfiable but worried about housing policy as a renter

02 Observation

Comfortable with doing home maintenance, unsure towards tasks that are more unknown to him (e.g. gas heater)

03 Need

Accessible tools and resources to perform home improvement by himself

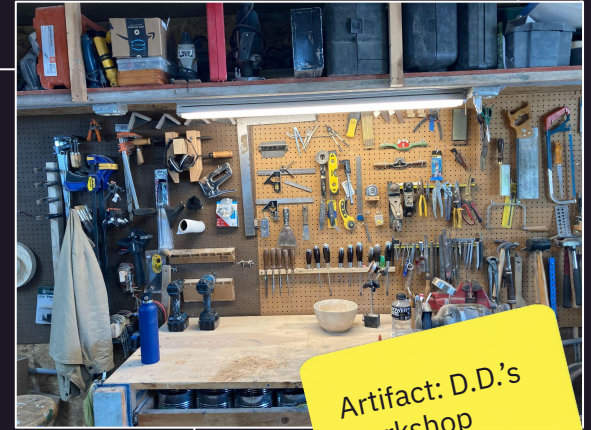


Interview 2



“Safety is important and it’s always on the top of my mind when I’m working”

– **D.D.**



Artifact: D.D.'s workshop

Team member roles:

- **Interviewer:**
Annika Damstedt
- **Recorder:**
Krystelle Baluyot

Location: Over zoom



Analysis



01

Insights

- Home improvement can be dangerous if you don't know the basics
- The quality of tools you get matters a lot
- Each project requires different skills and specialized knowledge



02

Observation

Has a lot of experience but still continues to learn and try new things.

03

Need

Safety reminders for when he gets distracted.





New Learnings

- **Cost of Making a Mistake**
 - Some people are afraid of making mistakes while doing home improvement that would cost more than having a professional do it right first.
- **Safety is very important**
 - Professionals are trained in safety and still make mistakes, so it is important for beginners to also know about safety



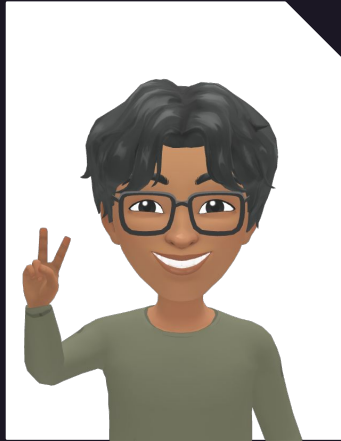
03

POV & HMW statements



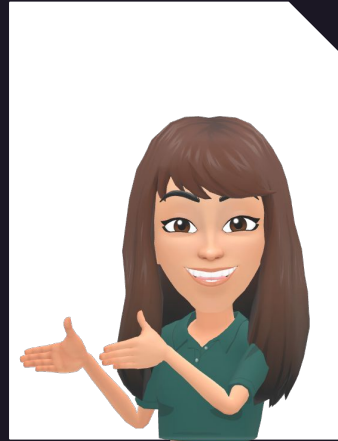


Participants for POVs



B.A.

UCSB student (19), renting a studio apartment, lives by himself



E.K.

Office manager at a home renovation company, wife of owner (a carpenter)



N.N.

Homeowner who does basic home maintenance in spare time





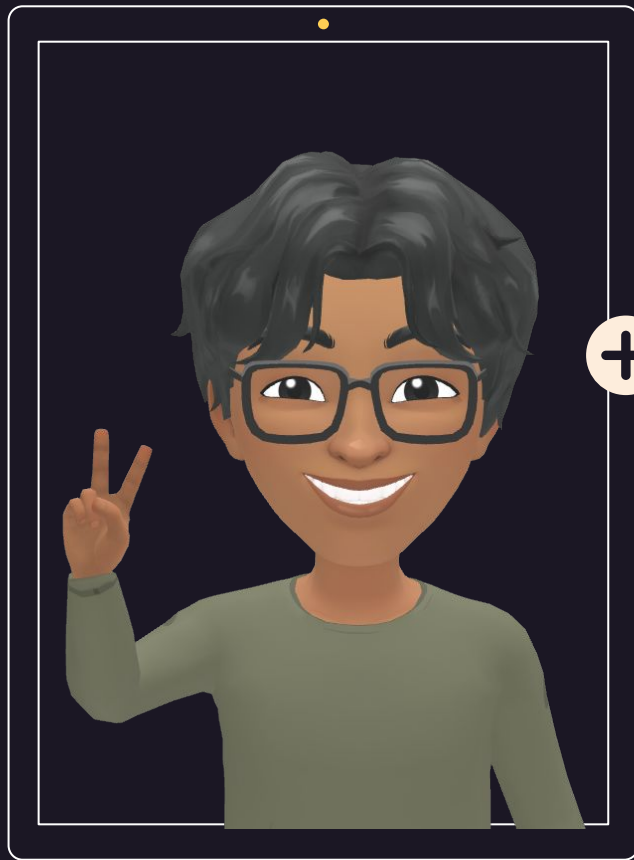
POV: B.A.

We met: B.A., a UCSB student living by himself in a studio apartment he rents.

We were surprised to realize that: he thinks it's better to do home maintenance himself, but ends up using professionals most of the time.


We wonder if this means that: he feels uncertain about his own capabilities, and, as a renter, prefers to trusts professionals to avoid costly mistakes.

It would be game changing... to help B.A. feel more comfortable to approach unknown home maintenance tasks on his own without the fear of damaging his rented apartment.







How Might We...



Reduce the fear of damaging a rented apartment?

Make renters less reliant on professional services?



Encourage renters to learn home maintenance skills in a fun way?



Make it more satisfiable and enjoyable to complete maintenance on your own?

Have friends with the same skills to help instead?


Make tools more accessible to complete tasks?



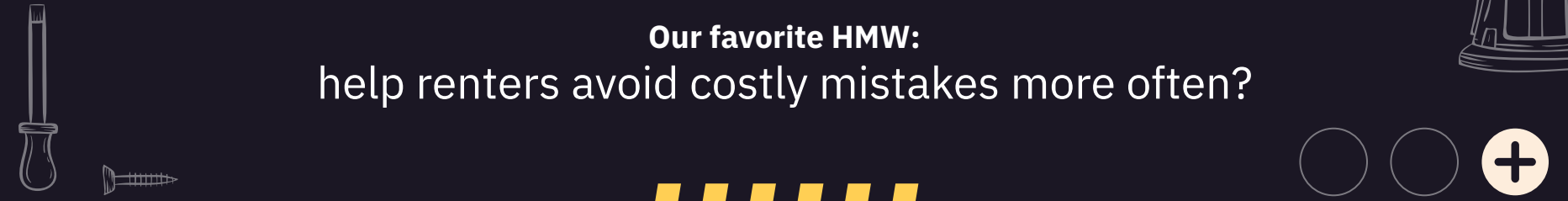

Make home maintenance feel more doable and less intimidating?

Lessen a renter's financial worries when attempting home maintenance tasks?

Provide resources to renters to learn how to do it themselves?



Our favorite HMW:
help renters avoid costly mistakes more often?





POV: E.K.

We met: E.K., an office manager at a home renovation company, married to the owner (carpenter)

We were surprised to realize that:

She's met many people who are unaware of gaps in their home maintenance knowledge.

We wonder if this means:

Current home maintenance resources are too complex or not designed for someone without prior knowledge.


It would be game changing...

If homeowners could find simple, easy-to-understand guides that help them identify and fill the gaps in their home maintenance knowledge.







How Might We...



Help homeowners realize the maintenance tasks they're overlooking?



Break down home maintenance tasks into actionable steps?




Customize information to fit a specific home?


Help homeowners ask the right questions before problems arise?

Translate home maintenance knowledge into simple, understandable language?


Help homeowners feel more confident about learning home maintenance?



Make obscure issues more visible to the average person?






Help homeowners understand urgent vs. minor problems?



Help homeowners find trustworthy advice?

Our favorite HMW:

Help new homeowners understand what they need to know about maintaining a home?





POV: NN

We met:

NN, a new homeowner who is recently gaining a lot of home improvement experience.

We were surprised to realize that:

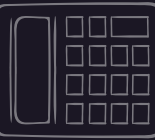
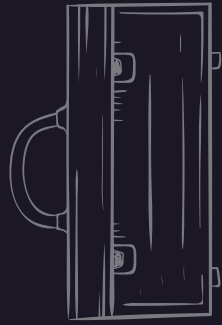
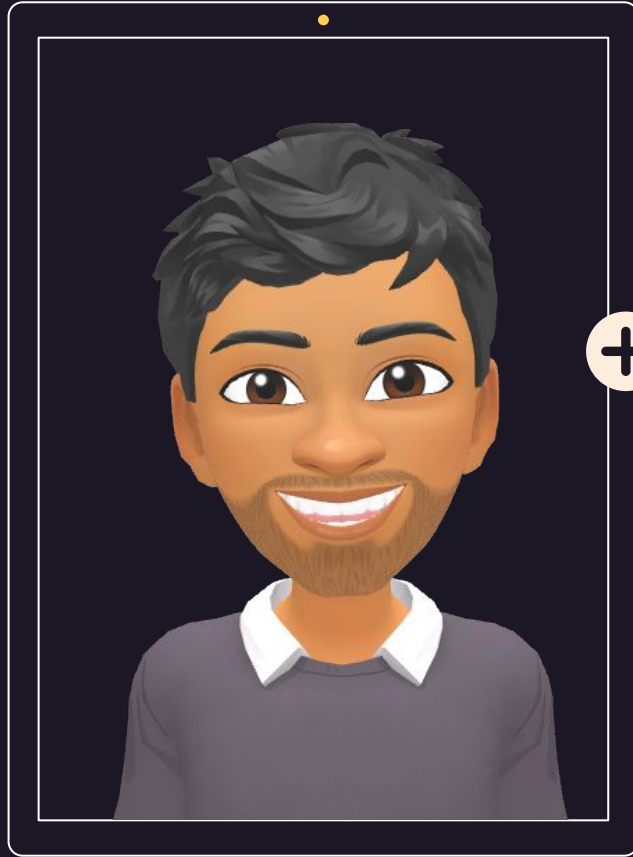
NN enjoys learning about home maintenance, but finds it annoying when a new unexpected problem arises that he isn't prepared for.

We wonder if this means:

He can only handle problems he's prepared for and relies on professionals otherwise.


It would be game changing...

If NN could be properly prepared for the problems that could happen.







How Might We...



Make relying on professionals less annoying?



Prepare for the most common problems?




Make knowing what caused a problem easier?


Make feeling unprepared more manageable?

Teach how to handle unexpected problems?


Teach what tools to use for what tasks?



Make it enjoyable when an unexpected problem occurs?





Provide the necessary supplies for a variety of problems?



Make relying on professionals cheaper?

Our favorite HMW:

Prevent home maintenance problems from occurring unexpectedly?




04

Solutions from HMW







HMW: help renters avoid costly mistakes more often?



An app that uses AR and provides step-by-step guidance to reduce mistakes during home repair



A learning tool that gives tutorials on how to do maintenance tasks




An app that connects renters with professionals who will fix mistakes for cheap prices


An app that gives a list and the cost of the necessary resources and supplies needed to perform specific home maintenance tasks

An app where you can find someone to borrow tools from


An app that shows renter-friendly and cheap DIY projects



An app that lists current housing policies on which appliances can be replaced or not



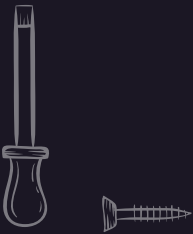
An app that recognizes unused parts and comes up with an idea on how to repurpose them

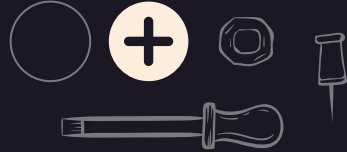



An app that provides easy ways to undo ready made home renovations kits



Our favorite solution:

An app that ranks the severity of home maintenance issues and says if they should be handled by a professional







HMW: Help new homeowners understand what they need to know about maintaining a home?



An app that provides a basic guide for new homeowners on regular maintenance

An app that uses AR to suggest what a home renovation could look like before it's done



An app that can design and give distinct dimensions for maintenance changes



An app that helps homeowners find information on all of their specific models of products and parts, and tools they might need

An app that connects you with tutors for home improvement


An app that collects videos and information about home improvement and sorts the difficulty



An app that recommends the easiest home renovation projects for beginners (matched to personal style)

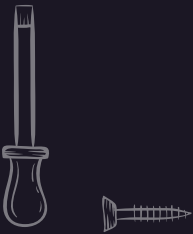
An app that teaches safety around home improvement

An app that scans a house and figures out its problems and future problem areas




Our favorite solution:

An app that compares the cost of doing home improvement DIY with professionals








HMW: Prevent home maintenance problems from occurring unexpectedly?



An app that teaches how to maintain products to keep them from breaking

An app that lists the possibilities of why a product needs to be fixed


An app that teaches you how to properly and safely maintain your tools



An app that provides reminders to motivate doing regular maintenance

An app that uses AR to recognize parts and products, and gives general information about them


An app that teaches you about bad habits that cause problems and how to stop them







An app that sells cheaper products that break less often

A robot that can do home maintenance for you in a quick and efficient way

An app where professionals could do home checks to catch problems before they happen



Our favorite solution:
An app that tracks the life of a product and predicts when it could malfunction



05

Experience Prototypes





Solution:

An app that ranks the severity of home maintenance issues and says if they should be handled by a professional

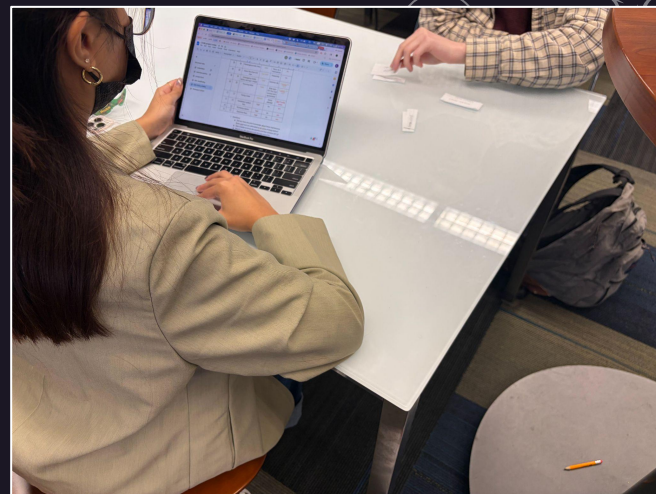
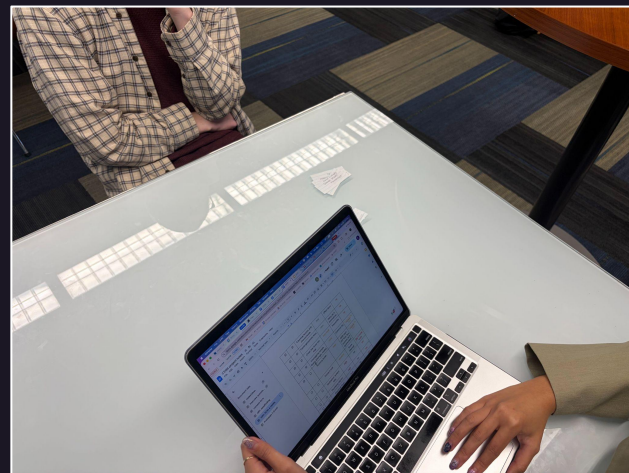
Critical Assumption: Users will be more encouraged to complete maintenance tasks if the app emphasizes how easy they are.

Description:

- Participant is shown 10 maintenance issues (*ranked by severity*) and asked if they would do it themselves, and create 2 piles based if it's doable or not to them
- Participant does it again but given information and statistics about whether it's an common and easy DIY, and if they should call professional services. Create 2 piles based if it's doable or not to them.

Participants:

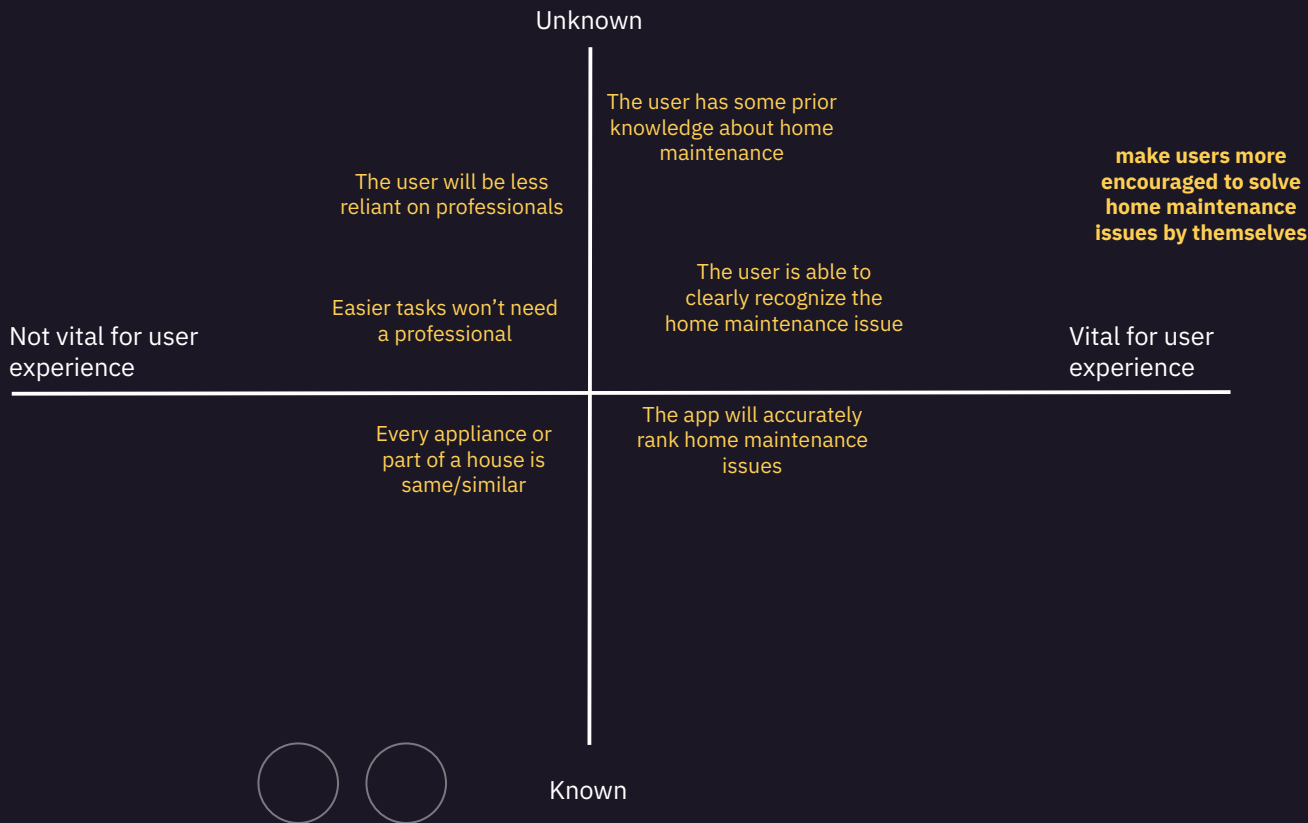
- **Who:** UCSB student
- **Recruitment:** personal connection
- **Relevance:** lives in a rented apartment





Critical Assumption Selection Process

Which of these assumptions, if false, will cause the idea to fail?






Results

#1	#2	Task	Severity	DIY statistic	Pro needed?
✗	✓	Changing AC filters	Low	Common basic task	No
✓	✓	Cleaning faucets and showerheads	low	Often done	no
✓	✓	Painting/cosmetic fixes	Low	Many do it themselves	no
✓	✓	Clean the dryer lint trap	low-med	frequently	no
✓	✓	Unclogging simple drains (plunger, snake)	med	Common diy	If simple fix fails
✓	✓	Running toilet	med	55% start DIY first, but success isn't guaranteed	If simple fix fails
✗	✗	Fixing a leak	medium	Some attempt	Yes if inside walls
✗	✗	Ventilation system fails	high	no	yes
✗	✗	Plumbing repairs	high	no	yes
✗	✗	Electrical fixes	high	no	yes

01 What worked?

Knowing how common people do maintenance task by themselves and if a professional is needed.



02 What didn't work?

Severity wasn't really a factor when deciding if a maintenance task is doable by yourself.

03 New Learnings

Participant would still not attempt a task if it's recommended that a professional is called.

04 Validity going forward

Our assumption is valid. Going forward, we can include descriptions of tasks to boost more encouragement (for those who don't have prior knowledge and experience)





Solution:

An app that compares the cost of doing home improvement DIY vs. professionals

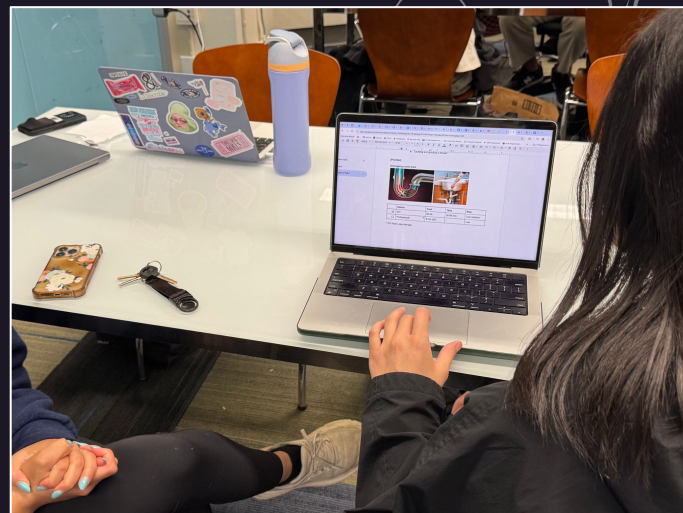
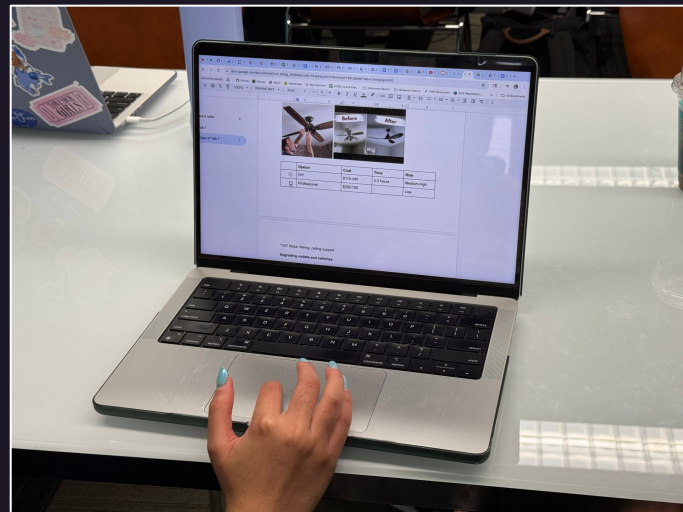
Critical Assumption: Cost is the primary driver in the DIY vs. professional decision.

Description:

- Participant was presented with both a verbal and pictorial description of six different maintenance issues
- Participant was given tables for each issue containing the cost, time, and risk for DIY vs. professional repair
- Participant was asked to choose between DIY vs. professional repair and rank cost, time, and risk according to their influence on the decision

Participants:

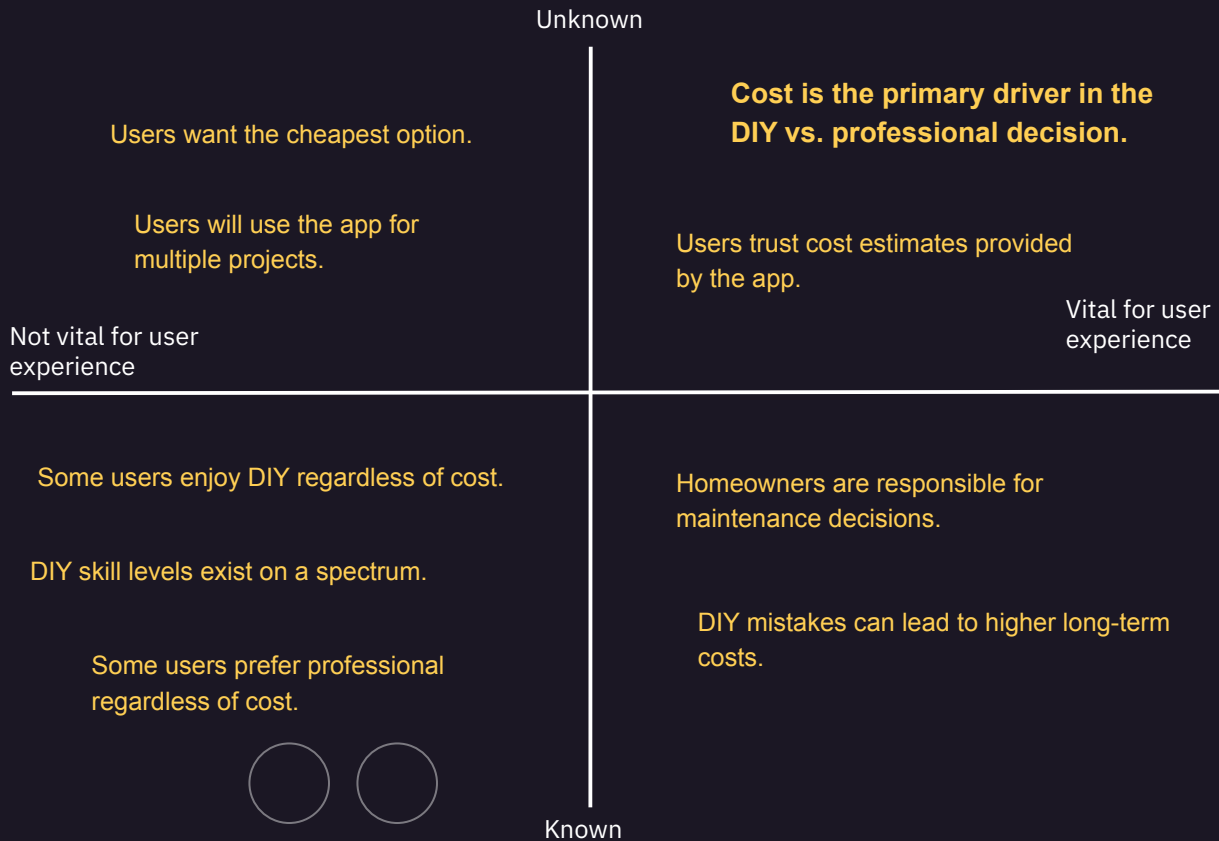
- Who: UCSB students
- Recruitment: Personal connection
- Relevance: People with “beginner” home maintenance experience





Critical Assumption Selection Process

Which of these assumptions, if false, will cause the idea to fail?



Task	Option	Choice	Cost	Time	Risk	Ranking (1 - 3)
Unclogging a sink drain	DIY	✓	\$5-40	30-90 min	Low-medium	R - C - T
	Professional		\$100-200	–	Low	
Replacing a garbage disposal	DIY	✓	\$100-200	2-4 hours	Medium	C - R - T
	Professional		\$250-500	–	Low	
Replacing a ceiling fan	DIY		\$110-340	2-3 hours	Medium-high	R - C - T
	Professional	✓	\$250-700	–	Low	
Upgrading outlets and switches	DIY	✓	\$15-50	30-60 min	Medium	C - R - T
	Professional		\$80-220	–	Low	
Repairing a door handle	DIY	✓	\$15-40	20-40 min	Low	C - R - T
	Professional		\$90-190	–	Low	
Caulking and grouting a shower	DIY	✓	\$30-75	3-6 hours	Medium	C - T - R
	Professional		\$300-850	–	Low	

Results

01 What worked?

Cost was often highly ranked among the three factors when participant was deciding between DIY vs. professional.



03 New Learnings

Participant often prioritizes risk factor over cost for more difficult/ complex tasks.

02 What didn't work?

Marginal differences in cost were not helpful in choosing between DIY vs. professional repair.

04 Validity going forward

Our assumption holds and we can explore this idea further. Cost comparison was often a useful factor when considering DIY vs. calling a professional.



Solution:

An app that tracks the life of a product and predicts when it could malfunction

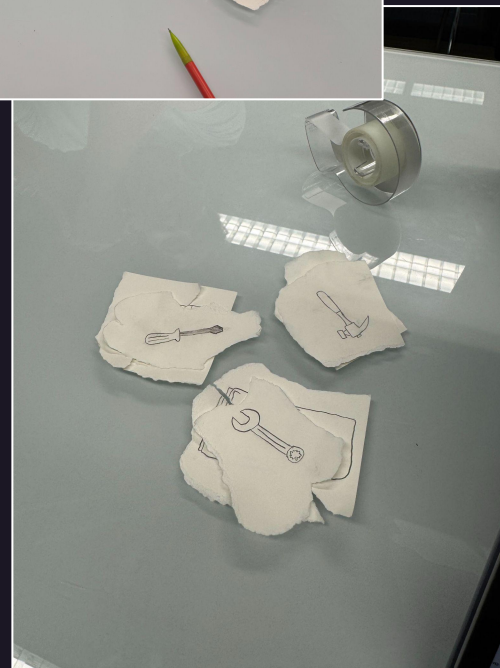
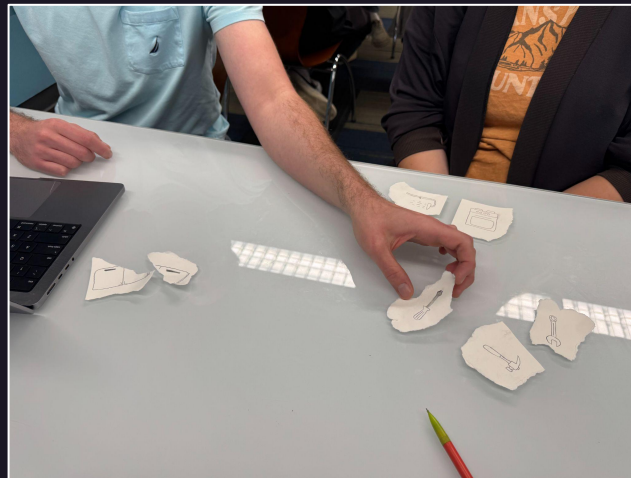
Critical Assumption: People want to know when something could break before it happens.

Description:

- People were given things that would break while distracted doing other things.
- They were given increasingly specific times about when and how the things would break.
- When things broke, they were tasked to fix it.
- At the end, they were asked how they felt.

Participants:

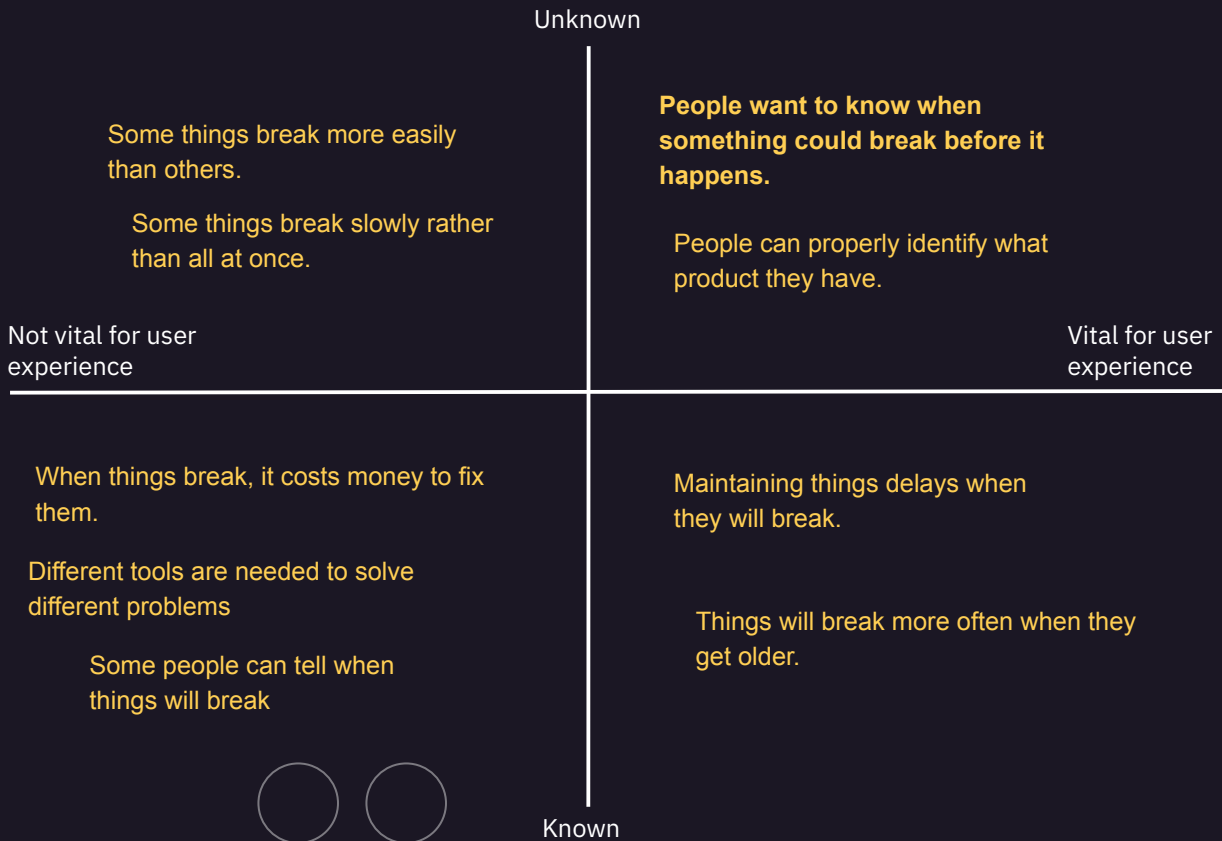
- Who: UCSB students
- Recruitment: personal connection
- Relevance: people beginning to explore home improvement skills





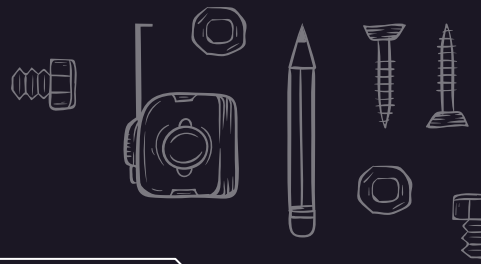
Critical Assumption Selection Process

Which of these assumptions, if false, will cause the idea to fail?





Results



01 What worked?

It got easier to fix the objects over time.



02 What didn't work?

Knowing the timing of when the objects would break was not super helpful.



03 New Learnings

Knowing when objects break doesn't make fixing them easier, practice does.

04 Validity going forward

Reported unhelpfulness invalidates this solution and it won't be explored further.





Solution Results

Cost Comparer

Task Ranker

Impact: Medium, prior knowledge and experience was also a factor into this

Reach: Medium, appeals to those wanting to learn

Novelty: High, lots of maintenance service apps but none that informs how common it is to DIY them

Impact: Medium, cost was an important factor in determining DIY vs. professional help

Reach: Medium, appeals to people who are open to both DIY and professional home repair

Novelty: Low, there already exist some apps that do cost comparison for home maintenance issues with the help of AI

Life of Product

Impact: Low, didn't fix the HMW we hoped it would.

Reach: High, everyone owns things that will break because of the objects lifespan.

Novelty: High, there are no prediction tools for when your things would break





Chosen Solution: Combining Task Ranker & Cost Comparer

Description: An app that ranks home maintenance tasks by how common it is to DIY, how risky it is to DIY, and how much it costs to DIY compared to having a professional do it.

Populations served:

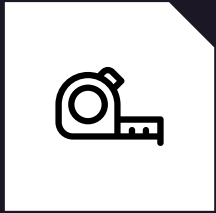
- Renters and homeowners

Who might we be leaving out?

- People who aren't the primary caretakers of their houses

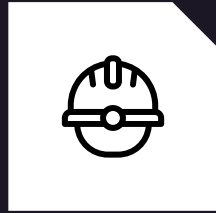


Next Steps



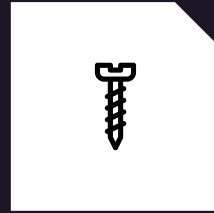
01

Do market research
on similar products



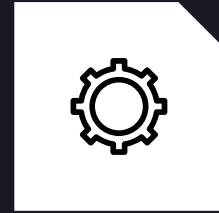
02

Storyboard the
concept video



03

Film the concept
video



04

Set up the website



06

Appendix



Solution Brainstorming

