



occipital

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We are a team of UX apprentices at Fresh Tilled Soil.

We performed an initial audit on Scanner, Room Capture, and Fetch. Through our initial evaluation with designers and developers, we assumed that minor usability barriers prevented users from understanding the full capabilities and imagining future use cases. We tested a prototype that reflected those UI changes. Despite the improved ability to achieve a better scan, users still didn't see a purpose in the sensor.

During the second phase of our audit, we tested and interviewed iOS developers. The biggest takeaway is that they experienced the same frustrations as the previous interviewees. They also couldn't find a use case compelling enough to pursue.

Internal Audit

Heuristic Evaluation

We analyzed each application in accordance with the principles developed by usability experts Jakob Nielsen and Rolf Molich

This type of evaluation looks at the application by itself – focusing on the quality of usability principles such as system status, error prevention and recovery, and consistency.

See <http://www.nngroup.com/articles/ten-usability-heuristics/>

Key findings:

System status and error messaging:

While the Scanner provides some error messages and visual cues, these would be improved by more descriptive text and explanations. There are some functionalities (old vs. new scanner) that are not explained within the application itself.

Consistency:

Two buttons exist for the same purpose but are each given different graphic treatment and placement. Although these exist in different phases of the scan process, similar treatment would help users with recognition and decrease uncertainty.

Heuristic Evaluation

Heuristic	Evaluation	Risk Level
Visibility of System Status	Indicate app is performing a scan: Scan button turns into stop icon Indicate object is being scanned: Any area that is scanned is covered in a “white plaster” material as it is captured Indicate app is processing data to add color: “Applying magic” text appears Old/New (RGBA) option for scan: Before and after choosing either, there is no indication of the difference between the two	Moderate/ High
Match between system and the real world	Error messages are written in system oriented language rather than user oriented language	Moderate/ High
User control and freedom	Able to exit and restart scan at both phases: during scan and while viewing the scan render	Low
Consistency and standards	Both buttons to restart scan use different naming conventions, graphic treatment, and placement, “back” is not as descriptive as “rescan” or “reset”	Moderate/ High
Error prevention	Users are unable to press scan if they stand too close to the object, no visual cue Red appears over objects when you are too close during scan, but no preventative text accompany visual status When tracking is lost and movement is too quick, preventative text flashes too quickly	High
Recognition rather than recall	All instructions are on introduction screen, and these instructions are not easily retrieved (need to restart app)	Moderate
Flexibility and efficiency of use	Only option for exporting model is the Apple Mail client (vs. Dropbox integration or a fuss-free option of just entering email)	Moderate/ High
Aesthetic and minimalist design	“Applying magic” is a non-descriptive indication of system status Instruction screen is dense, not easily scanned	Low
Help users recognize, diagnose, and recover from errors	Unclear error messages: “move gently” is not descriptive	Moderate/ High
Help and documentation	Documentation is thorough, but it would be nice to be able to access that from within the app	Moderate

Mental Model

Mental Model

Features		User Assumptions
Need-based on-boarding	App Launches Overwhelming On-boarding Yes; empty battery alert Bounding box & depth map	App Launches Expect to use app once/twice Sensor is automatically ON Indication of objects in scan parameter
	Two-fingers Pinch & Zoom Instruction to scan all-surfaces Yes; “plaster” coating the model Yes; restart button Yes; too close and object lost warnings Better wording and longer visibility	Expect native iOS camera gestures Expect to scan an individual object without background Indication of when to finish scan Real-time preview of scan Being able to restart scanning Indication of error
	 Varies; depends on experience level and understanding of app Suggestions on ideal objects to scan; better feedback Change “Email” button to “Export”	Expect accurate and realistic scan Next steps involving using scan
		Post-scan

- Current Features
- Recommendations
- Key Assumptions

User Interviews

“[Room Capture] is kind of
amazing.”

- Matt, Front-End Developer

Matt

Interview Highlights

- Quickly skimmed the starting instructions; the inability to go back to it wasn't able to recall the instructions at a later point

Scott

Interview Highlights

- Didn't see need to keep old tracker and non-HD color option “I don't know what old or new tracker is. For a first time user, I don't see the importance of this”
- Wanted more intuitive and intelligent method to focus on objects. “It would've been nice if I could've clicked on the thing so I could get rid of all of this extra artifacting (scanning the table and other extraneous surfaces)”
- Despite the 3D quality exceeding his expectations, he didn't see a use case outside of game development

“3D apps have gotten a lot better...
but I don’t know why I would use
them beyond taking 3D photos.”

- Scott, UX Designer/Developer

“Either I’m doing it very wrong or it
just doesn’t do it very well.”

- Dave, Full-Stack Developer

While testing the Scanner app

We assumed that since these users weren't our **target demographic**, the lack of purpose was due to a **lack of experience in iOS development.**

So we went and interviewed some iOS developers...



To close n object - move back

Lu Quan

iOS Developer

BACKGROUND

- Comes from a mechanical engineer background - has interest in new hardware + software combo
- Has previous exposure to 3D scanning - but in a lab environment with a professional grade 3D scanner.
- Looked into the Structure website and documentation prior to testing

MAIN STORIES

- Willing to try anything new and exciting
- Found the sensor's capabilities underwhelming compared to other high-fidelity 3D scanners
- Found the scanning process difficult due to lack of proper on-boarding
- Tried to scan many different objects, found limitations in dark and shiny objects - in order to evaluate

Lu Quan

Interview Highlights

- Initially, he didn't make the connection of the sensor being mobile to potential uses.
- Access to the hardware is a barrier for him. He wanted to test the scanner before purchasing.
- He was concerned about the Scanner results. He was comparing it to high-end scanners he has used in the past.
- When asked about scan quality versus mobile trade-off, he found the mobile aspect to be the most interesting advantage. Suggested uses: accessory for drones, putting sensor in front a car.

Colin

iOS Developer

ROLE / BACKGROUND

- Interest with augmented reality is a novel/fun thing; no purpose
- He's a dorm parent at a boarding school, he is developing something for their iPhones to make their jobs easier
- Hears of new things through his work requisite and authors/contributors of work he finds interesting

TASKS

- Seeks in new frameworks the ability to alleviate the struggles of his everyday life/ dev work.
- Finds AR to be a fun thing to fool around with, but has no purpose for it

MAIN STORIES

- Colin wasn't able to scan the cup properly due to lack of feedback and cues (moved too fast or too slow)
- Does know what he's using the app for - therefore no certain expectations

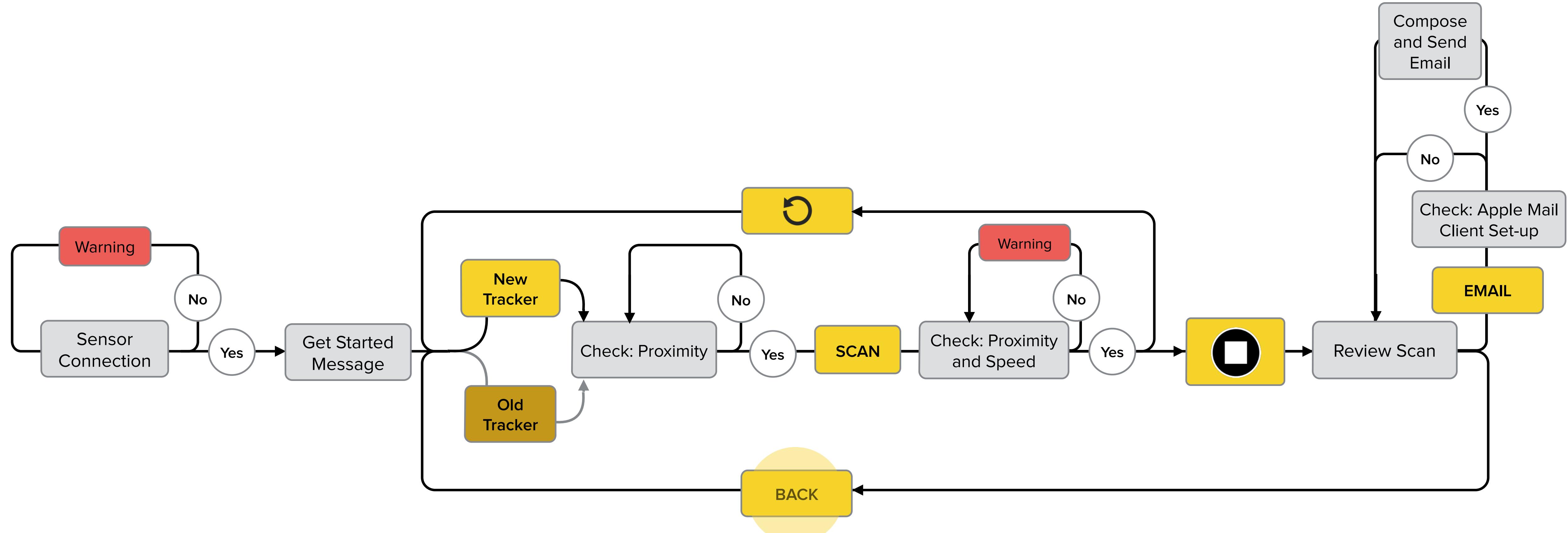
Colin

Interview Highlights

- Enjoyed integrated visual indicators rather than text. Ex: the scan turns red when the user gets too close.
- Interested in escalating signifiers / sign of progression. He would rather have the text appear after a few visual warnings first, and once the text is understood, it doesn't need to appear again. “Once I understand the message, I don’t need to see the words again, I just need a visual indicator of what I’m doing.”
- Biggest issue was knowing how he was doing. “the app doesn’t really clue me in to how it’s working.” No indication of when he’s doing something right.
- Didn’t have purpose for the sensor, therefore wouldn’t keep using it.

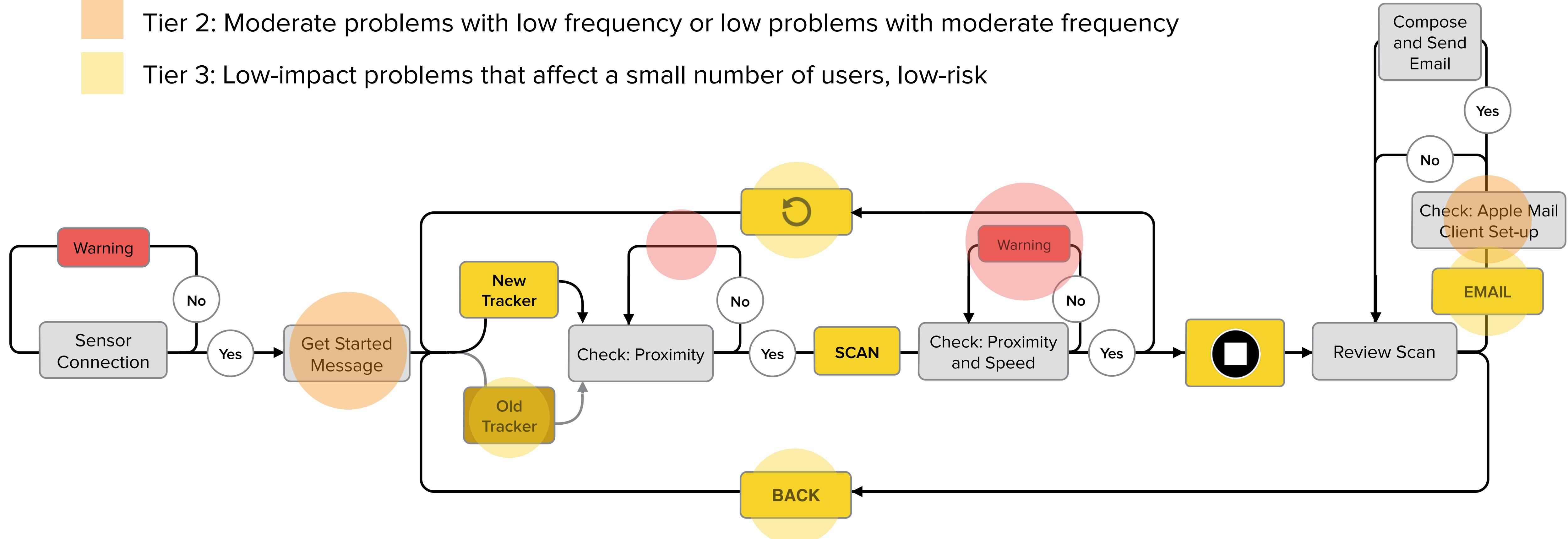
User Journey

Scanner User Journey: Before



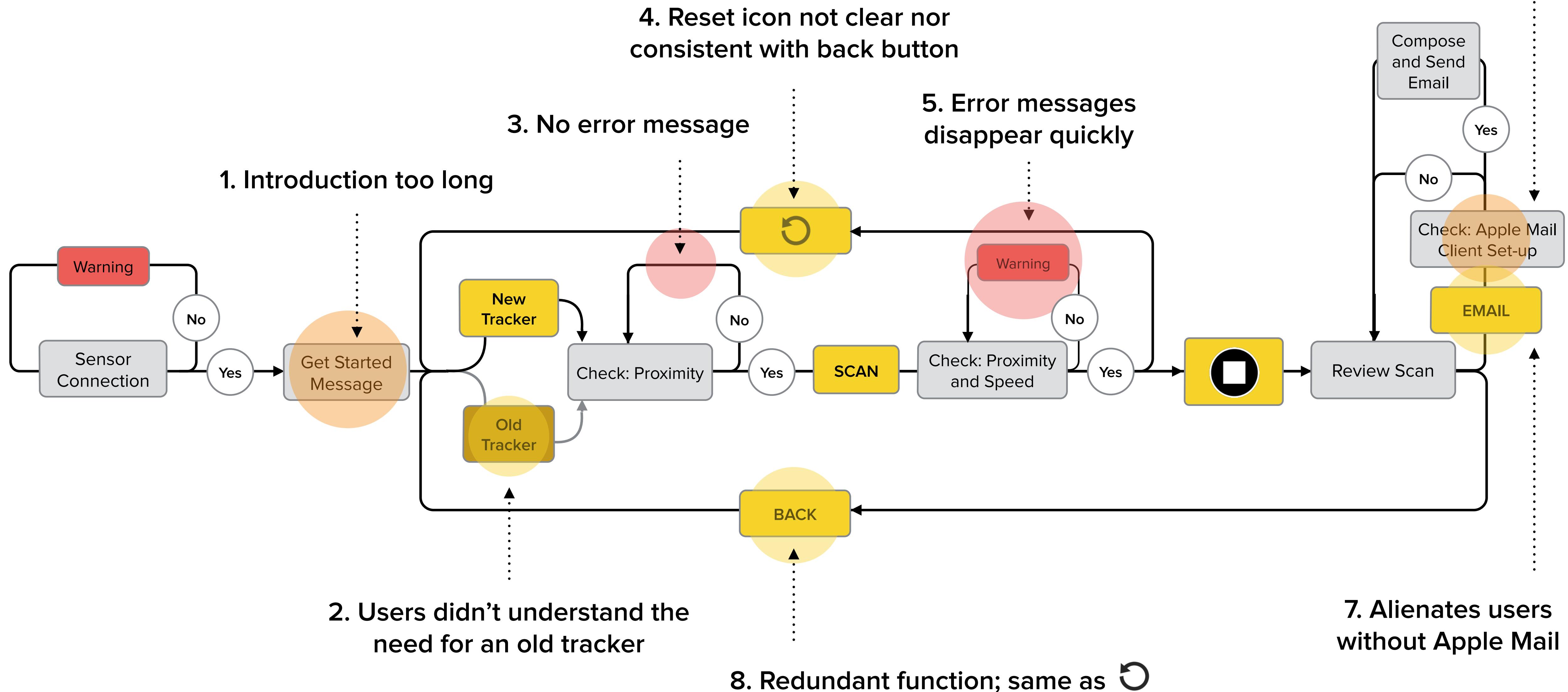
Scanner User Journey: Before

- Tier 1: High-impact problems that often prevent a user from completing a task
- Tier 2: Moderate problems with low frequency or low problems with moderate frequency
- Tier 3: Low-impact problems that affect a small number of users, low-risk

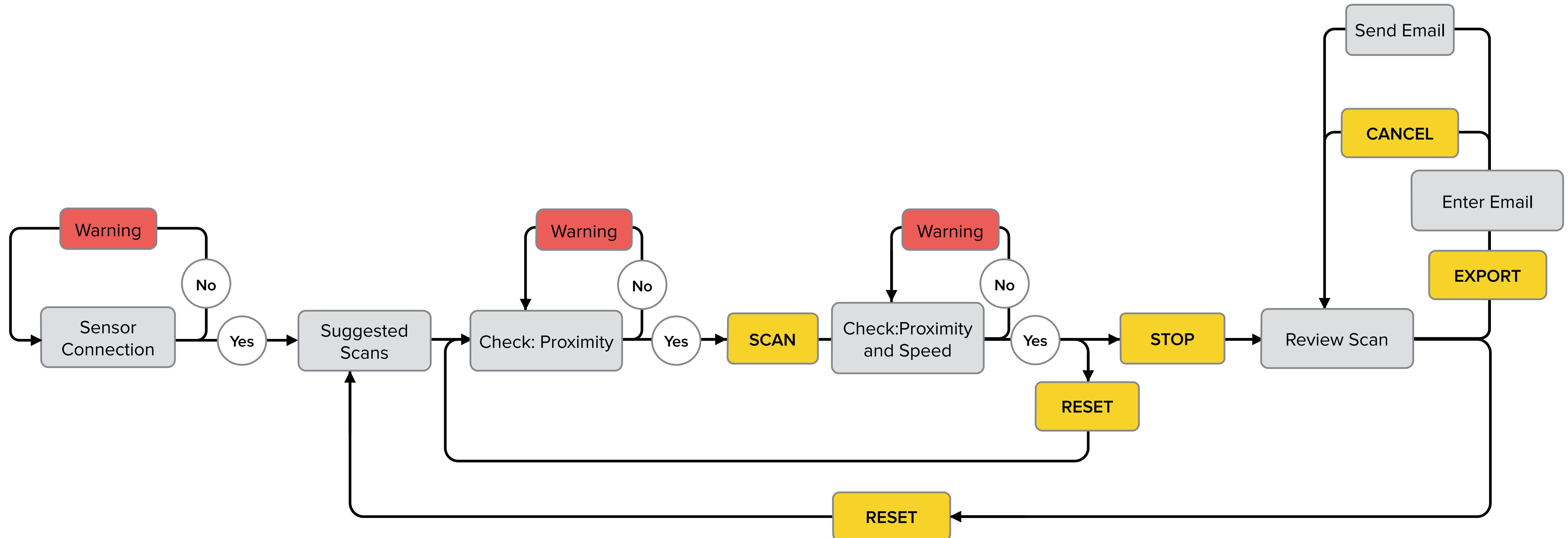


Scanner User Journey: Before

6. Language and visibility not ideal



Scanner User Journey: After



Prototype

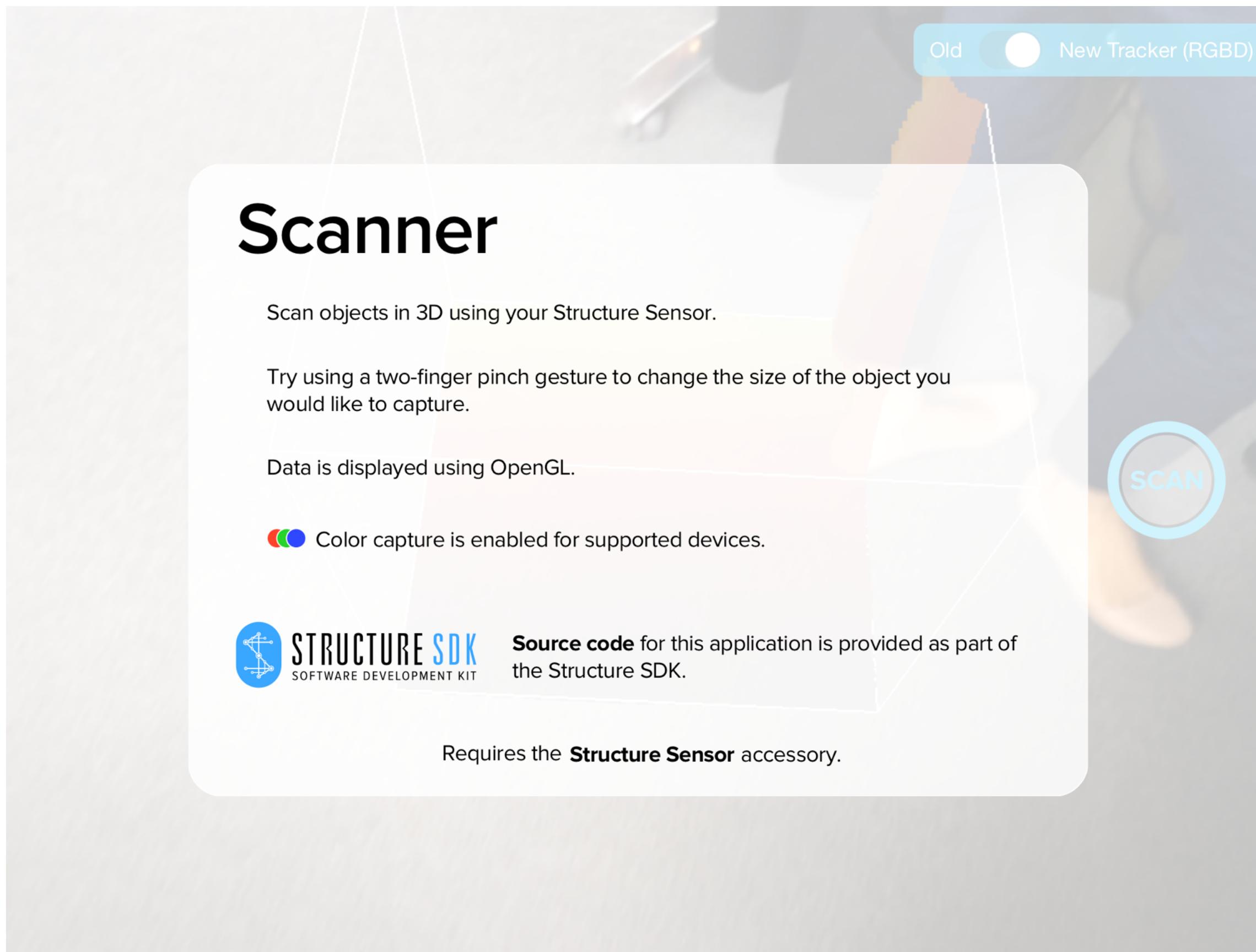




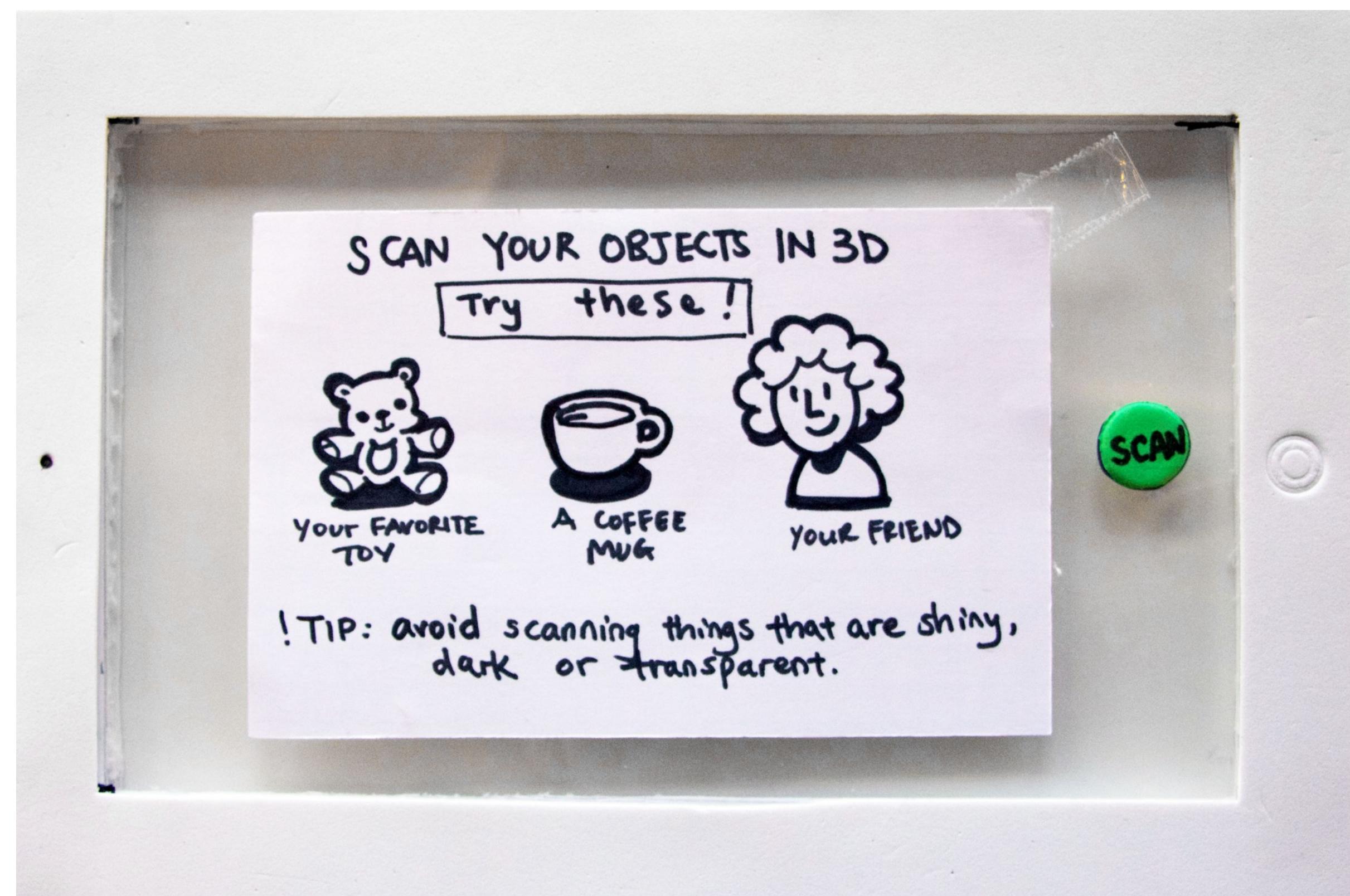
Building

1

Existing Interface: Introduction is too long and instructions are only available on the home screen. We found users generally skipped this and the few who read through the instructions forgot it immediately after moving to the next screen.



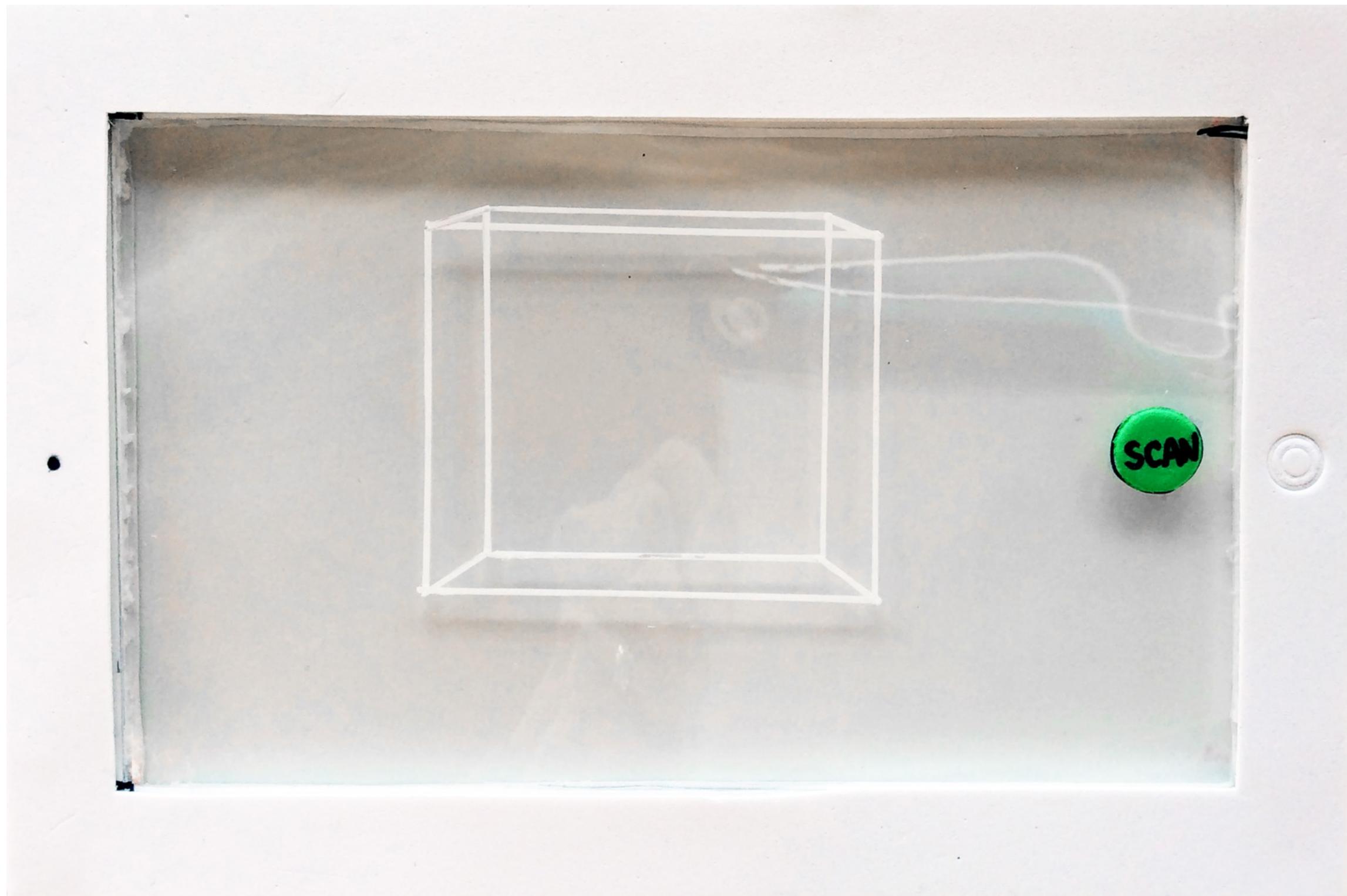
Solution: Reduced text and replaced with images to create a simpler on-boarding experience. Provided suggestions to help guide the user. This allows them to grasp the sensor's capabilities from the beginning.



2

Existing Interface: Users didn't understand the need for the old tracker. There were no visible difference nor explanation.

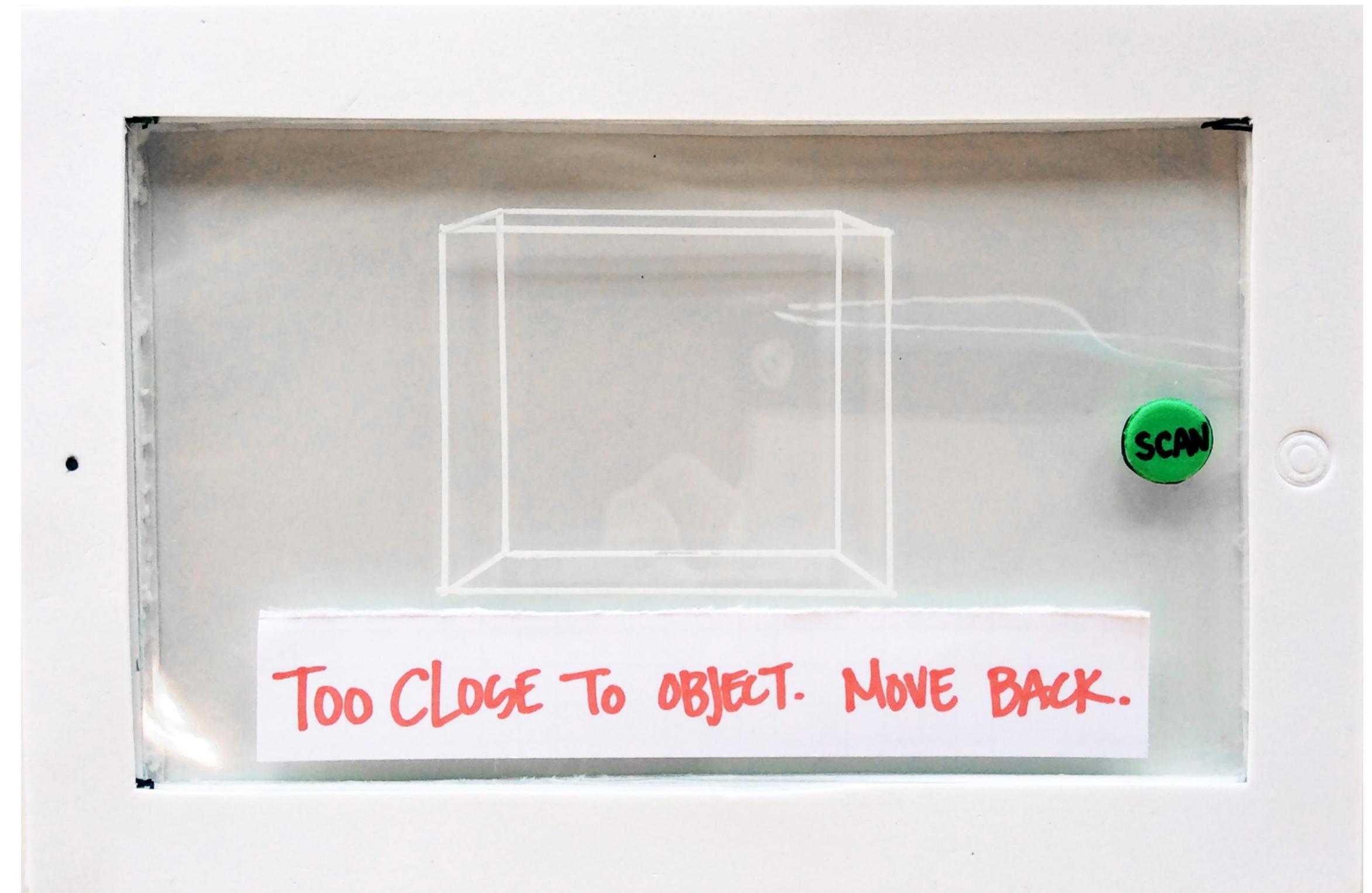
Solution: Removed old tracker from demo app. This option is irrelevant in exhibiting the sensor's functionality.



3

Existing Interface: Provides no warnings prior to scanning. Inactive SCAN button is the only indicator of error, which went unnoticed by users until they tried to scan.

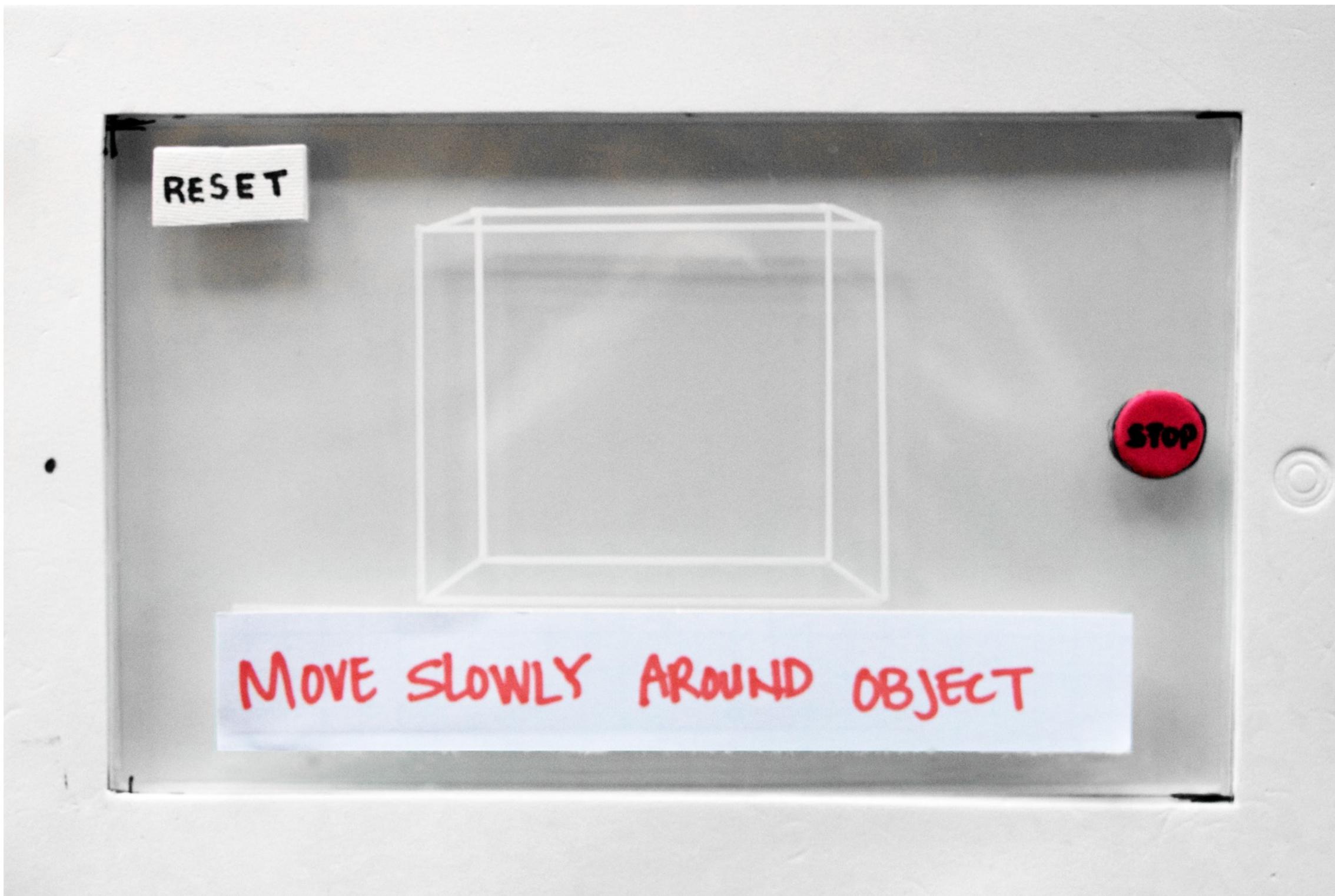
Solution: In order to prevent errors, warnings are presented to the user in real-time throughout the scanning process.



4

Existing Interface: Reset icon not clear nor consistent with back button.

Solution: Unified naming conventions for  and back button with RESET. For consistency, changed placement to upper left corner of screen. This gives users control to exit and restart scan.



5

Existing Interface: Warnings appeared and disappeared too quickly to register. Users are also expected to recall instructions from the introduction screen.

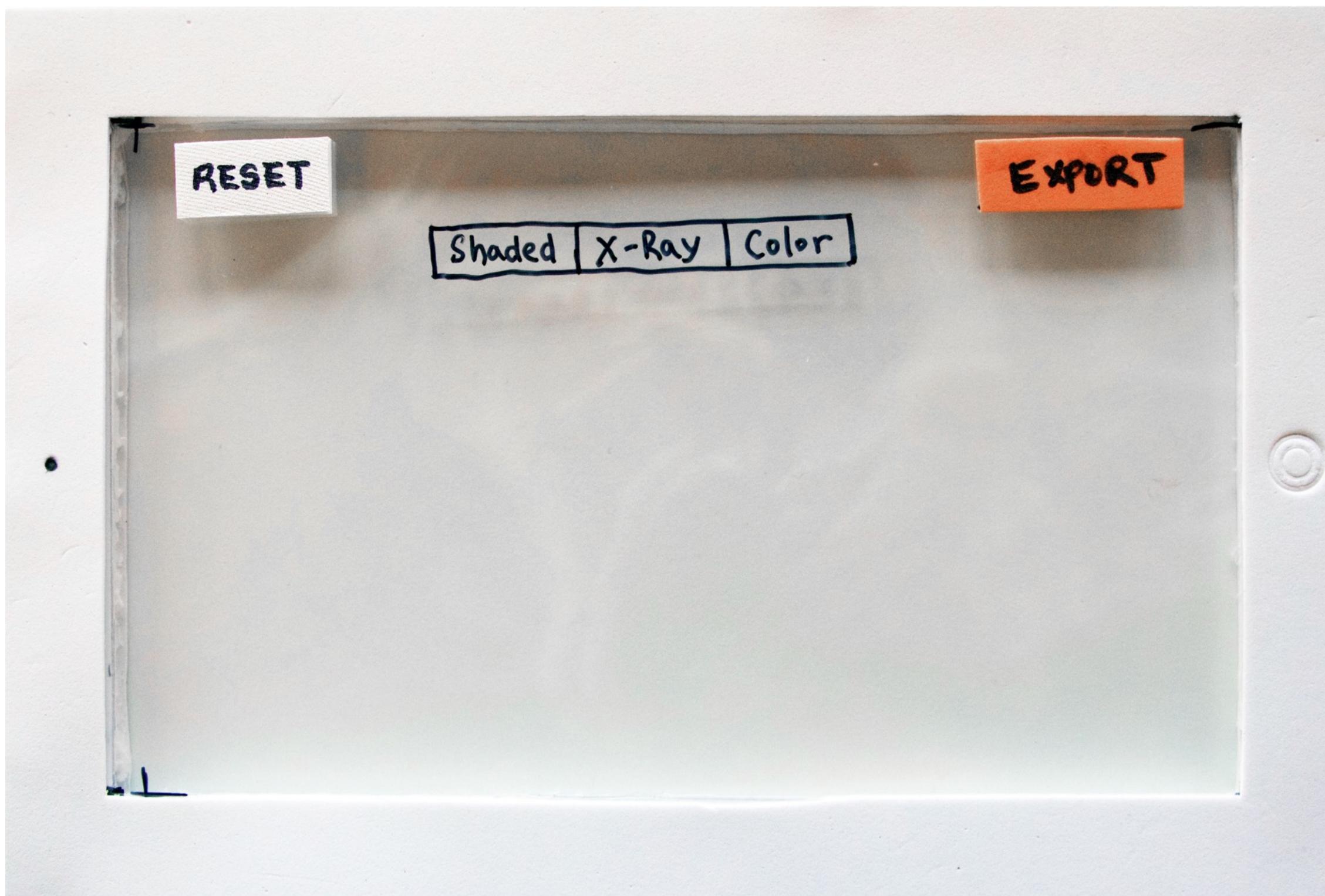
Solution: Elongated the duration of the warnings and assured users throughout the scanning process with clear and short instructions.



6

Existing Interface: Language and visibility not ideal.

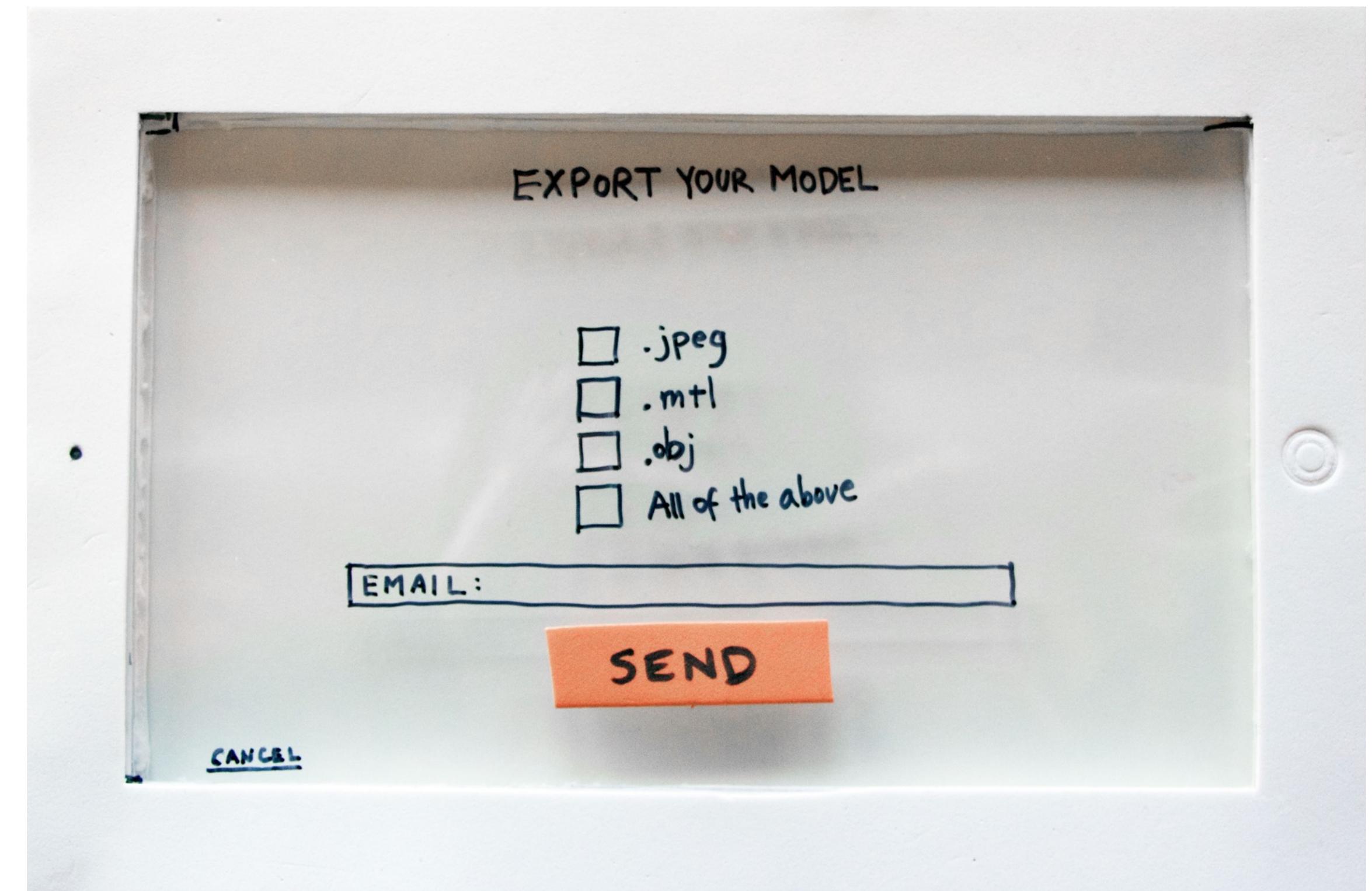
Solution: Replaced EMAIL with EXPORT to create a more compelling call-to-action.



7

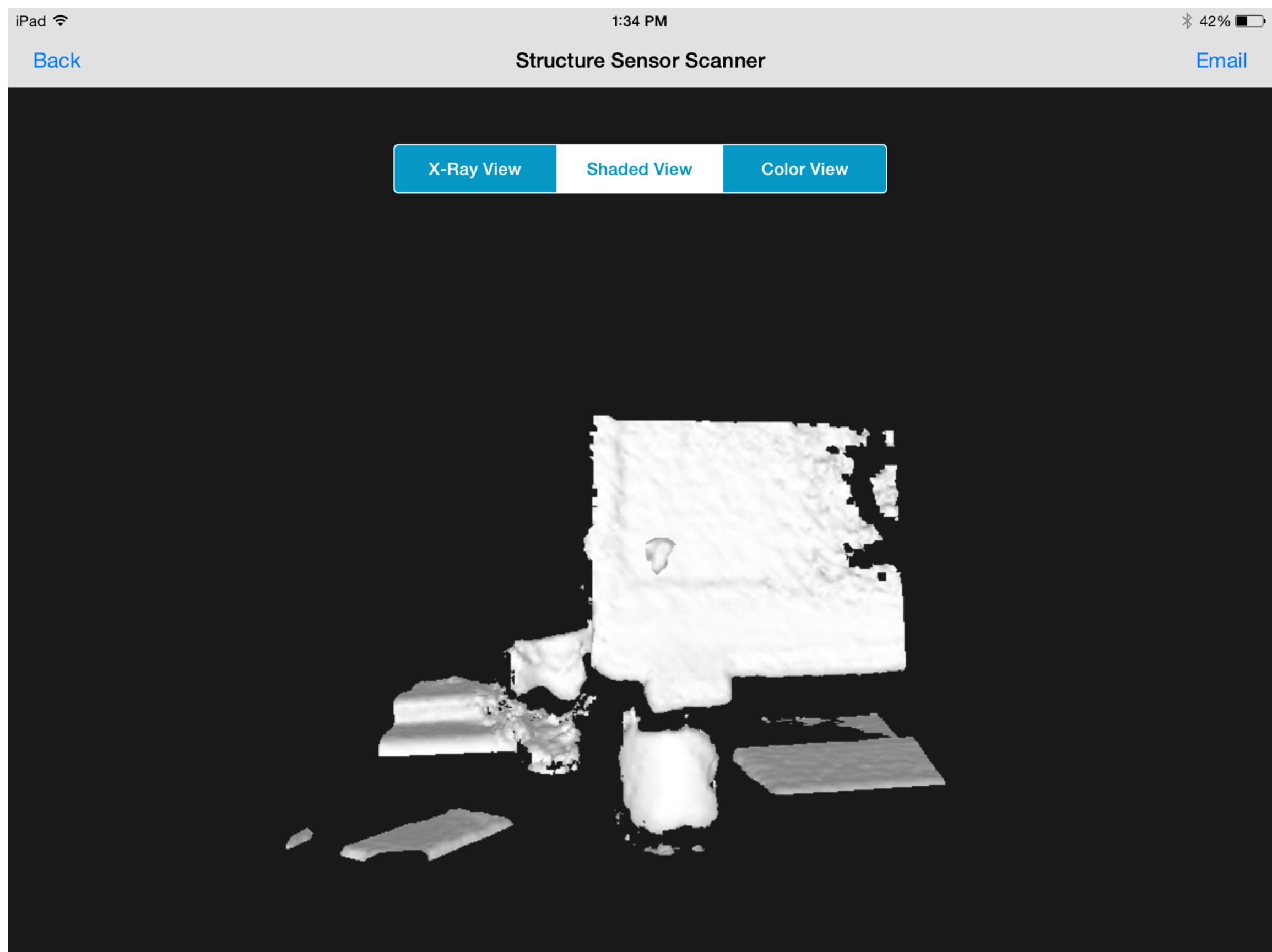
Existing Interface: Alienates users who do not have Apple Mail set up. Users cannot export scan without this feature.

Solution: Created a new pop-up screen to allow users to input email address and bypass Apple Mail. Also, provided more agency by allowing users to have control over what files to send.

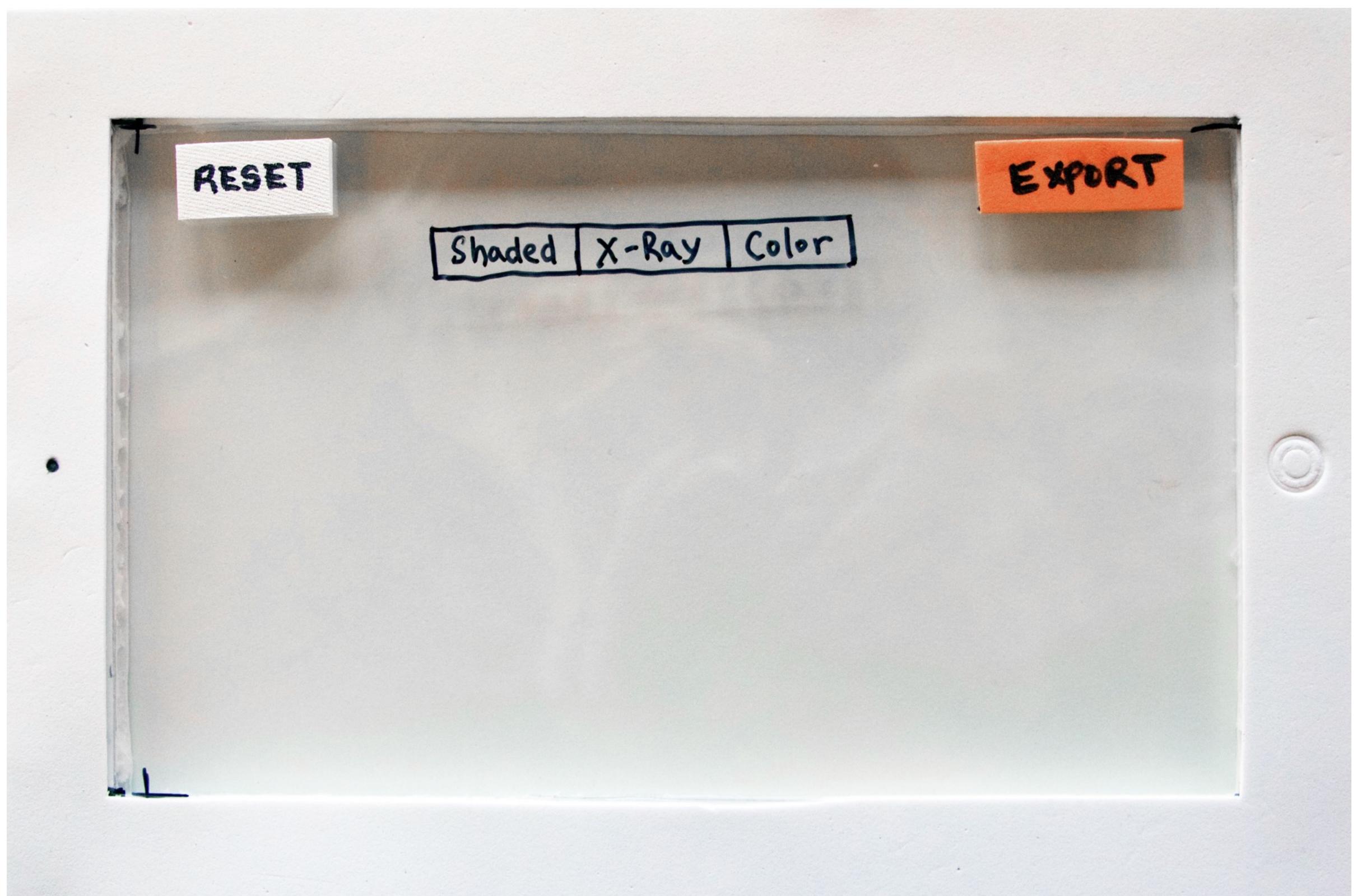


8

Existing Interface: Redundant function; same as ⌂ button.
The word BACK is not reflective of where it takes the user.



Solution: Unified naming conventions for ⌂ and back button with RESET. For consistency, changed placement to upper left corner of screen. Took the user back to the on-boarding screen to begin a new scan.



“I don’t know if this makes enough of a
difference.”

- Colin, iOS Developer

Regarding the UI improvements

Insights

Users with Need vs Curiosity

The current approach benefits early adopters who have a specific need/purpose for the sensor. But for other early adopters (and future purchasers) who bought the sensor because they are excited by the technology itself – we need to remember that this sensor occupies a new, unique space and that getting people to see new use cases often involves working through existing approaches to or understanding of 3D technology.

Existing Conceptions About 3D

Users with 3D Experience

- Expects similar quality output to stationary equipment
- Current mental model blocks advantages of mobile
- Default to behaviors associated with stationary equipment

Users with Limited/No Experience

- Lack of a mental model for 3D
- Need more guidance to validate results
- Ideas don't go beyond apps used (scanning objects, scanning furniture and placing in rooms)
- Skeptical of accuracy

Developers are consumers.

The current sample apps do not lead users
to see the full quality of the sensor.

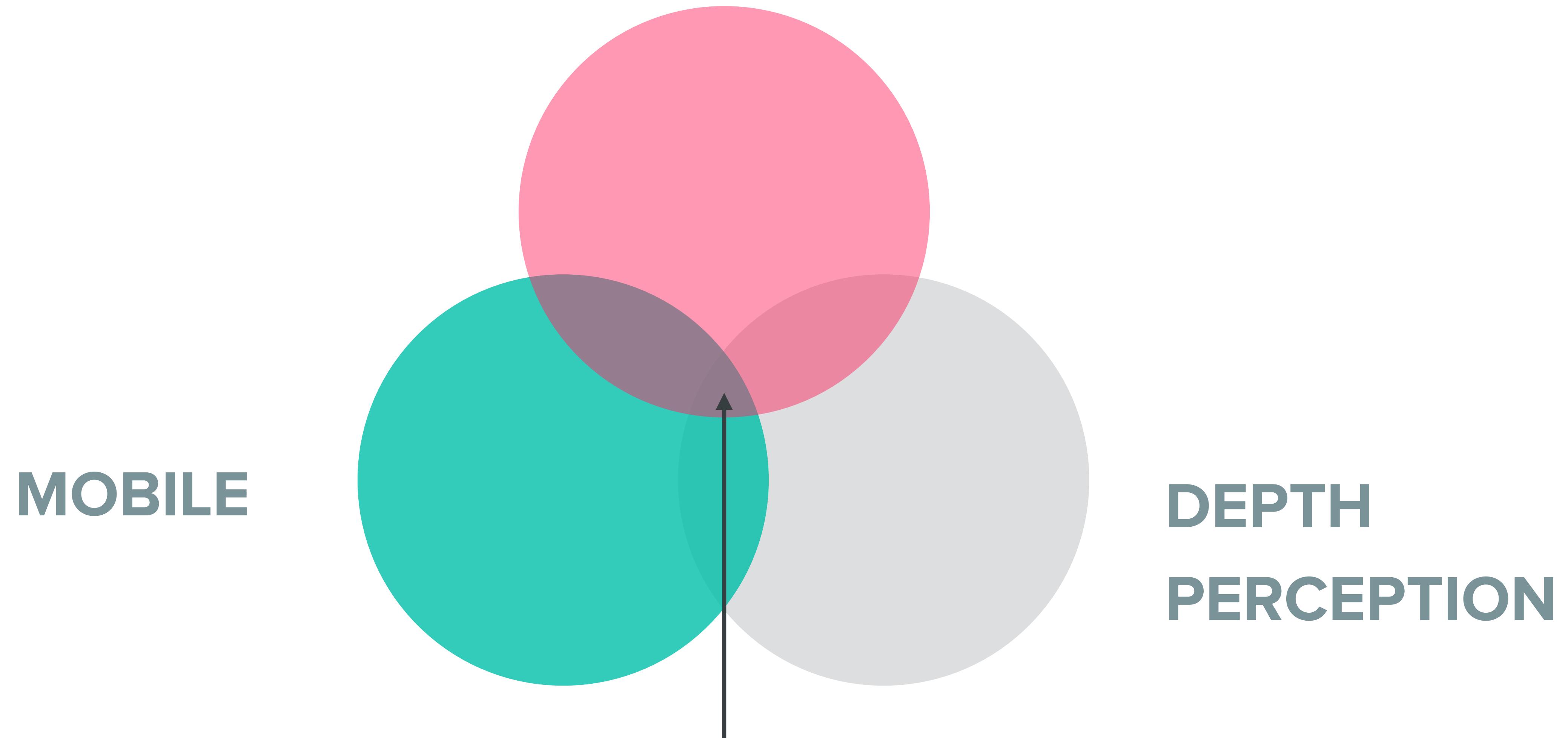
Occipital should focus on one, polished,
consumer level app to highlight its mobile
capabilities.

Recommendations

Suggested approach to the first experience

- Move the sample apps off the landing page and out of the Apple Store - their main purpose is to be a skeleton for development
- Package the sensor with a fully-developed, consumer level app that
 - Challenges existing ideas about 3D technology
 - Shows the advantages of the sensor: **mobile, real-time depth-sensing and position tracking**
 - Demonstrates how the sensor fits into daily life

POSITIONAL TRACKING



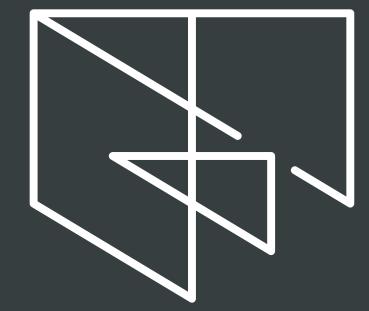
We've started exploring how applications that use all of the features of the sensor can be simple solutions to everyday problems. These unexpected uses of 3D technology would complement the advances in VR/AR gaming and demonstrate the range of appeal for this sensor.

Next Steps

Where do we go from here?

- More user testing with target demographic: iOS developers - difference between task-based and exploration-based user testing
- Increase the ease of getting started
 - Increase availability of sensor : rental program/ residency
 - Apply UI improvements and keep in mind the limitations of its design
<http://52weeksofux.com/post/694598769/the-local-maximum>
- Utilize the unique advantages of the sensor as a mobile, real-time depth sensing and location tracking technology to invigorate an age-old problem.

Thank you!



fresh tilled soil