Moses Kamau



Architect

Multimedia design & graphic design

Product design

AMAZON CONFIDENTIAL / ALEXA SMART HOME

Alexa Smart home





Experimental baking



Playing golf



Making short films

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Case Studies

1. Alexa Guard (Redrock)
2. Smart cameras & computer vision with Alexa

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Project RedRock

Alexa Guard

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Security driven customers (56%)

They are constantly seeking ways to **better protect themselves.** They desire products that provide them **“peace of mind”**.

- Keep their family safe (40%)
- Monitor their home (35%)
- Control their devices remotely (29%).

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How can we provide Alexa customers with safety, security, and peace of mind around their household – both the people and their belongings?

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

Echo Family Devices

Sensors

Cameras

Security Panels

Lights

Locks

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

- Echo Family Devices
  - Acoustic Event Detection
    - Anomalous Sounds
      - Glass Break
      - Smoke Alarm
    - Human Presence
      - Speech
      - Laughter
      - Cough
      - ...More
  - Drop In
- Sensors
- Cameras
- Security Panels
- Lights
- Locks

RedRock

Self-monitoring system

Connected Devices

- Echo Family Devices
- Sensors
  - Motion Sensors
  - Contact Sensors
  - Security Cameras as Motion Sensors
  - CO Alarm Sensors
  - Glass Break Sensor
  - Water Sensors P1
- Cameras
- Security Panels
- Lights
- Locks

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

- Echo Family Devices
- Sensors
- Cameras
  - *Preferably Indoor Cameras*
  - Motion/Presesnce Detection
  - Live Camera Feed (Notif.)
  - Past Footage (3P app link)
- Security Panels
- Lights
- Locks

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

- Echo Family Devices
- Sensors
- Cameras
- Security Panels
  - Modes
    - StandBy
    - Stay Mode
    - Away Mode
  - Alarm State
  - Distress State
- Lights
- Locks

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

Echo Family Devices

Sensors

Cameras

Security Panels

Lights — Occupancy Pattern

Locks

AMAZON CONFIDENTIAL

RedRock

Self-monitoring system

Connected Devices

- Echo Family Devices
- Sensors
- Cameras
- Security Panels
- Lights
- Locks
  - Lock
  - Unlock

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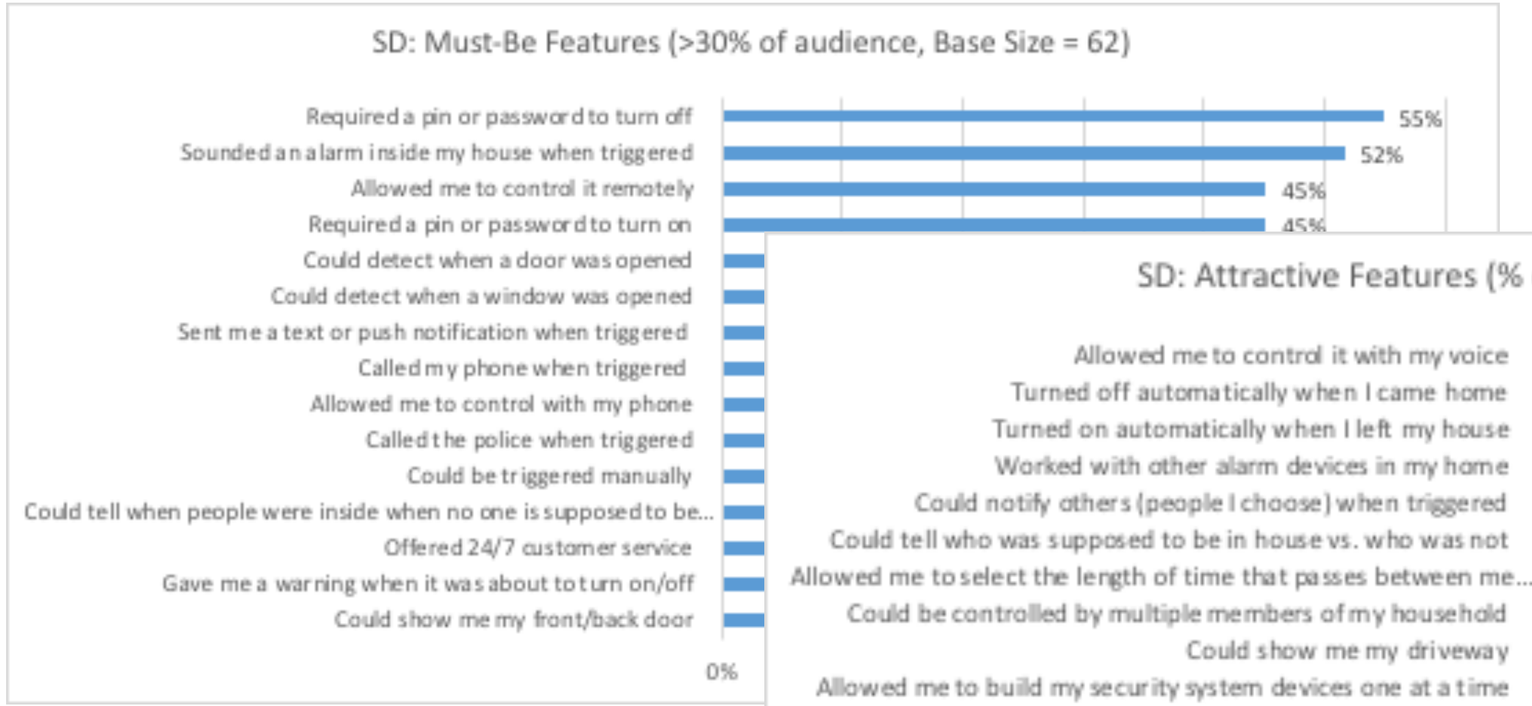
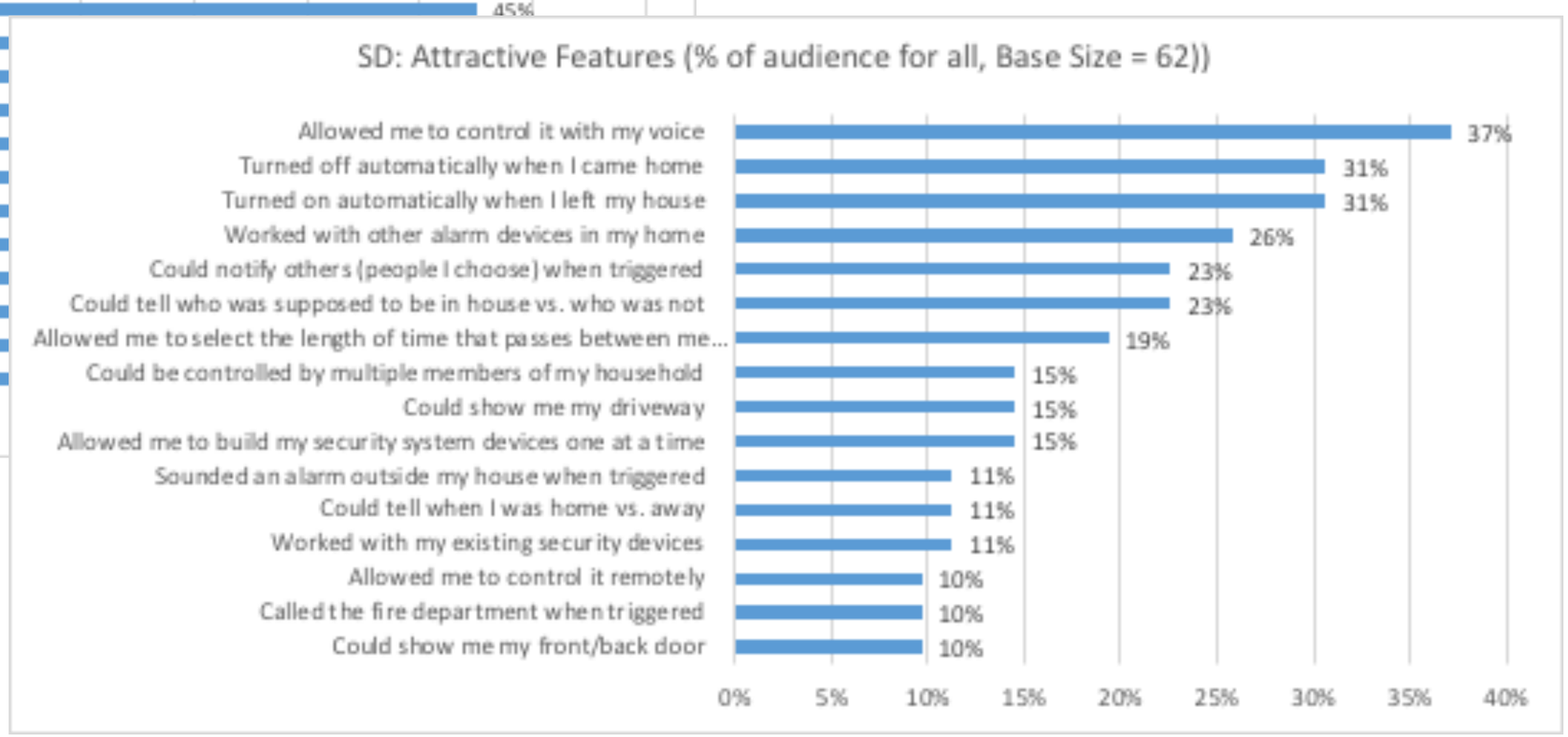
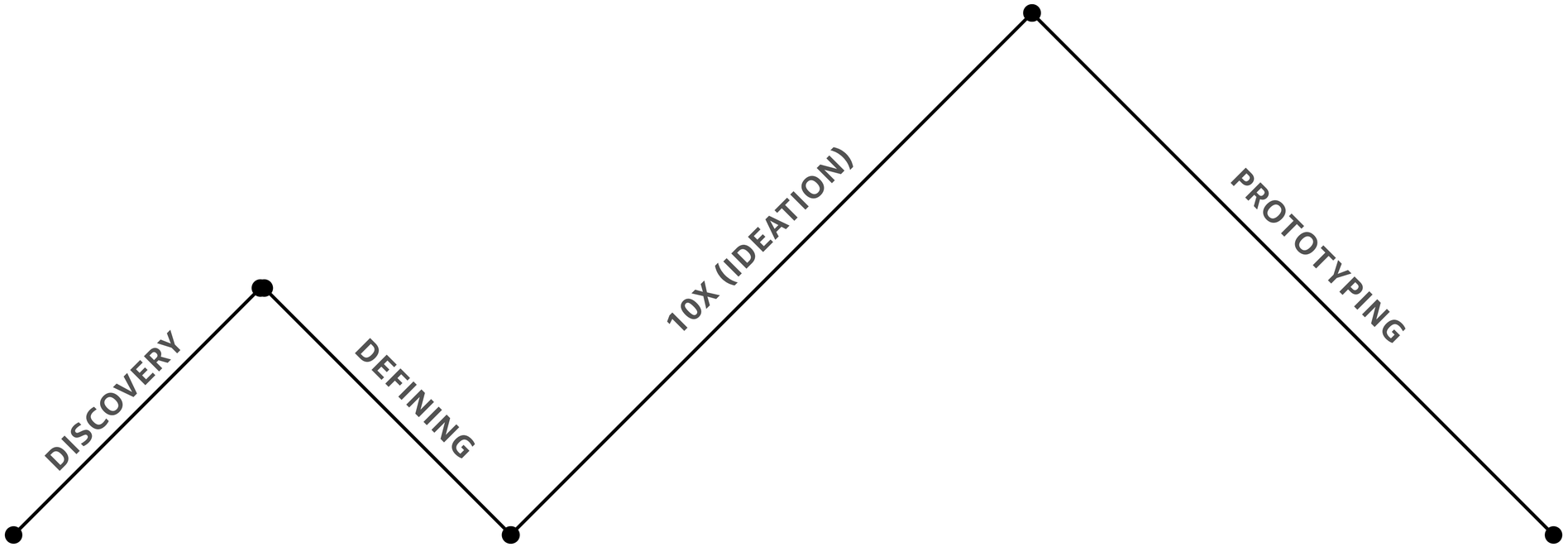
Customer Purchasing Journey Research Summary

Feature Prioritization





AMAZON CONFIDENTIAL



STAKEHOLDERS

Alexa Security
Smart Home UX
DDG
Smart home Research

Sensors
3P Security Panels
Camera
Lighting
Notifications
Alexa Memory
History
Hunches
Presence
AED
Device Software

Whole Home QA
Whole Home GUI
Whole Home API

ARTIFACTS

- PR/FAQ
- Research Docs

- Business Requirements
- User Stories
- Scope (guardrails)

- Ideation
- Brainstorming
- Wireframes
- Information Architecture (IA)
- Early stakeholders meeting

- Mid Fidelity Prototypes
- Early VUI Flows
- User Testing
- Mini Stakeholders Meetings
- Iteration

- GUI & VUI Flows
- Hi-Fi Prototypes
- Errors & Edge Cases

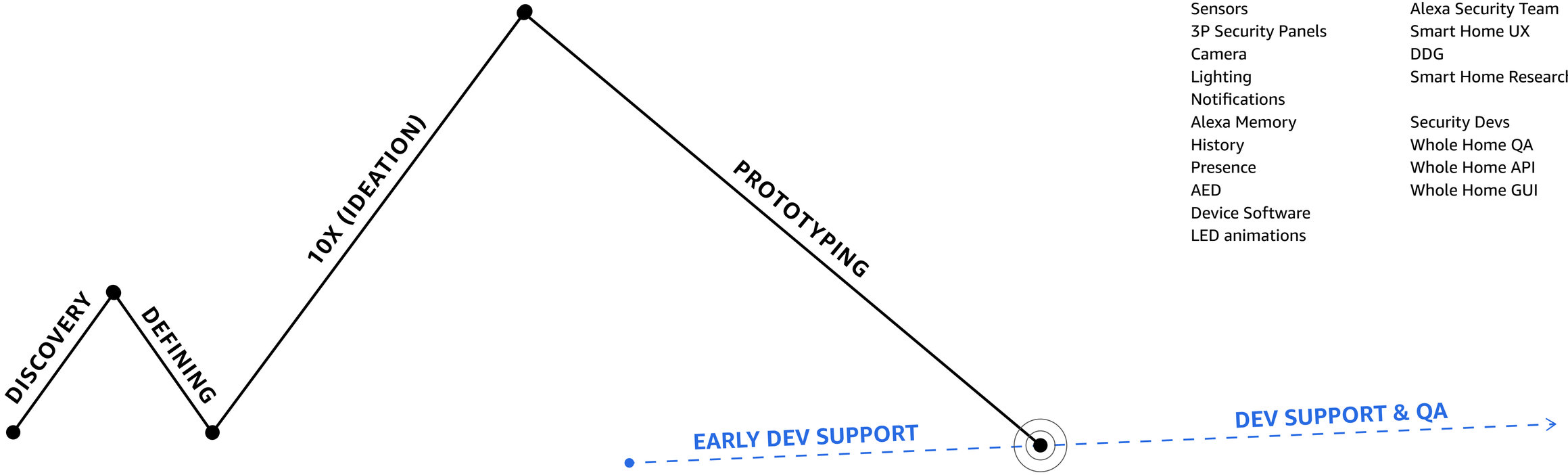
March 26th | April 3rd | April 20th | April 27th

STAKEHOLDERS

Sensors
3P Security Panels
Camera
Lighting
Notifications
Alexa Memory
History
Presence
AED
Device Software
LED animations

Alexa Security Team
Smart Home UX
DDG
Smart Home Research

Security Devs
Whole Home QA
Whole Home API
Whole Home GUI



ARTIFACTS

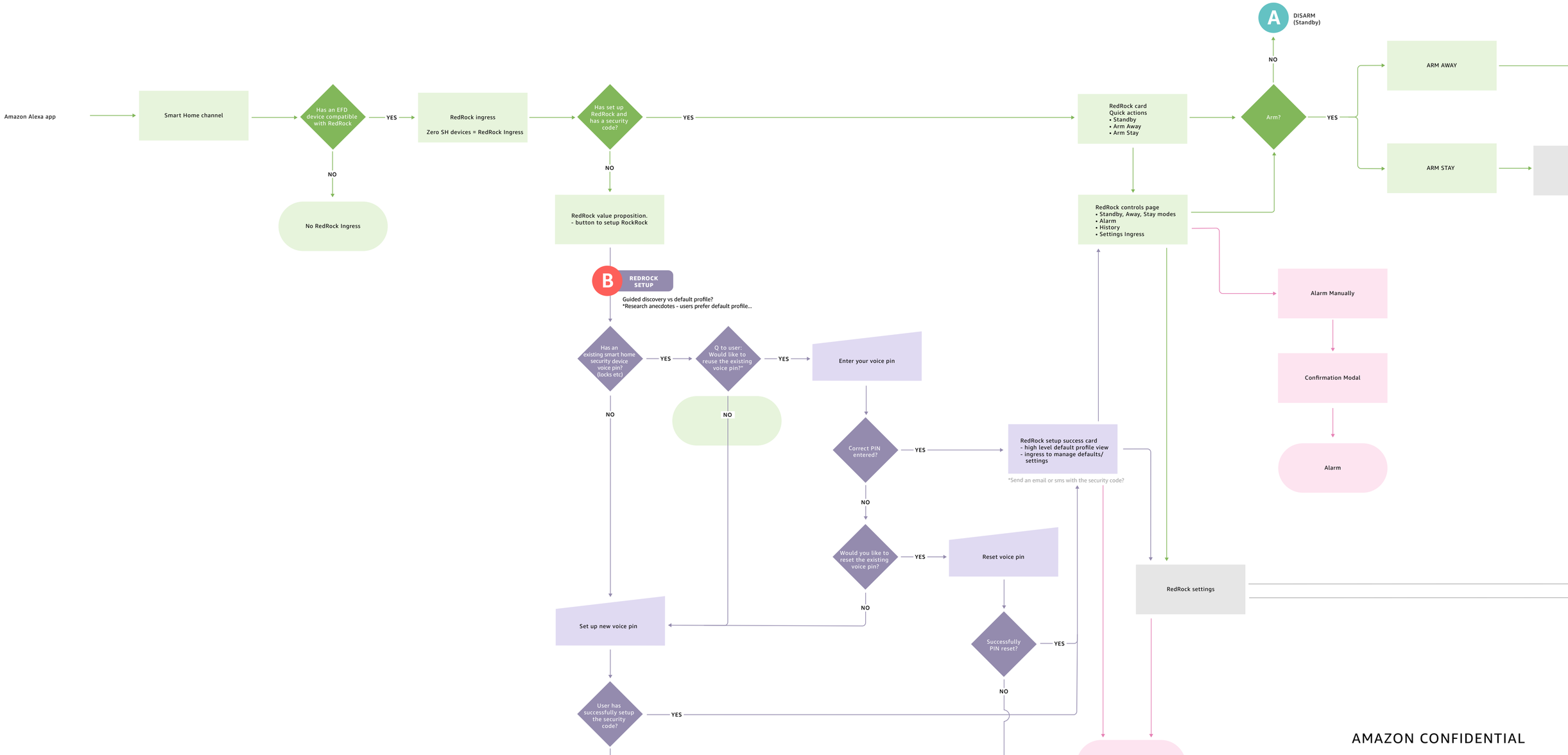
- PR/FAQ
- Research Docs
- Business Requirements
- User Stories
- Refined User Stories
- GUI IA
- Design Concepts
- Wireframes
- Mi-Fi Prototypes
- Refined GUI IA
- User Flows
- VUI IA
- Hi-Fi Prototypes
- User Testing (Golden Path Scenarios)
- Refined Prototypes
- Refined VUI Flows
- VUI & GUI IA
- GUI & VUI Flows
- Hi-Fi Prototypes
- Errors & Edge Cases
- Redlines

EVENTS

March 26th
April 9th
April 23rd
April 30th
May 7th
May 14th
May 21st
May 28th
June 4th
June 11th
July 2nd

- Channels design review
- Channels user testing
- Channels design completion
- RedRock Stakeholders share outs
- 1st developers CX review
- User research to be completed within one week (PM should attend)
- RedRock CX leadership review
- 2nd developers CX review
- QA planning begins
- RedRock Beta release

As a customer, I can arm RedRock through GUI



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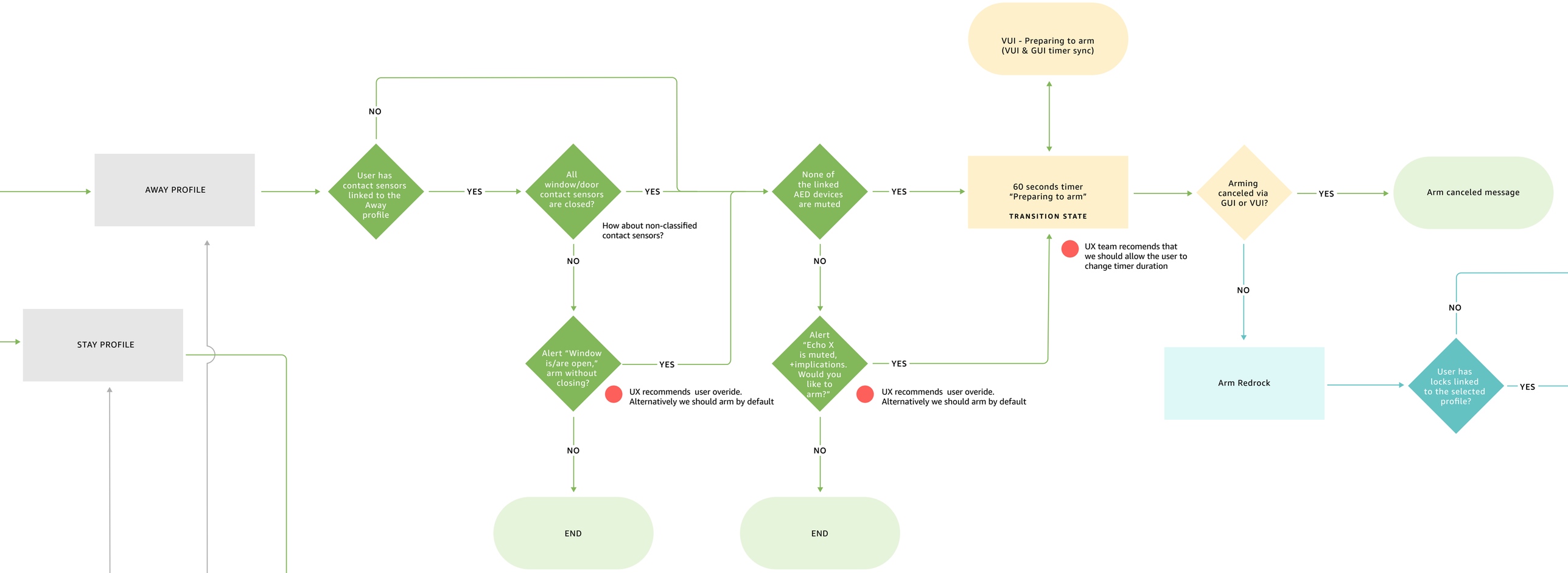

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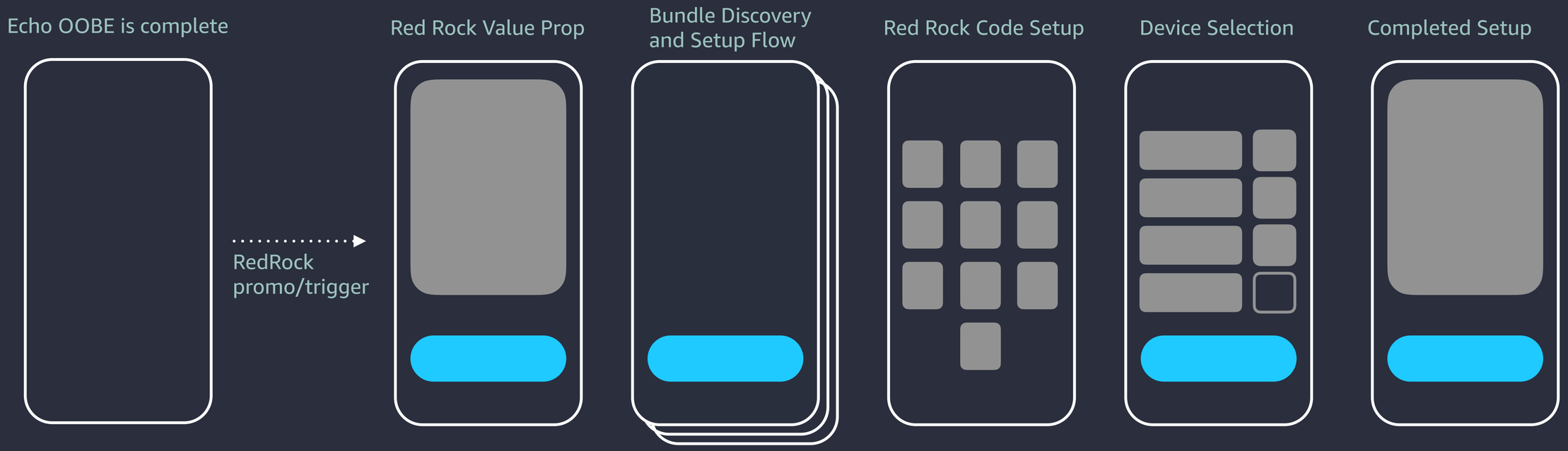
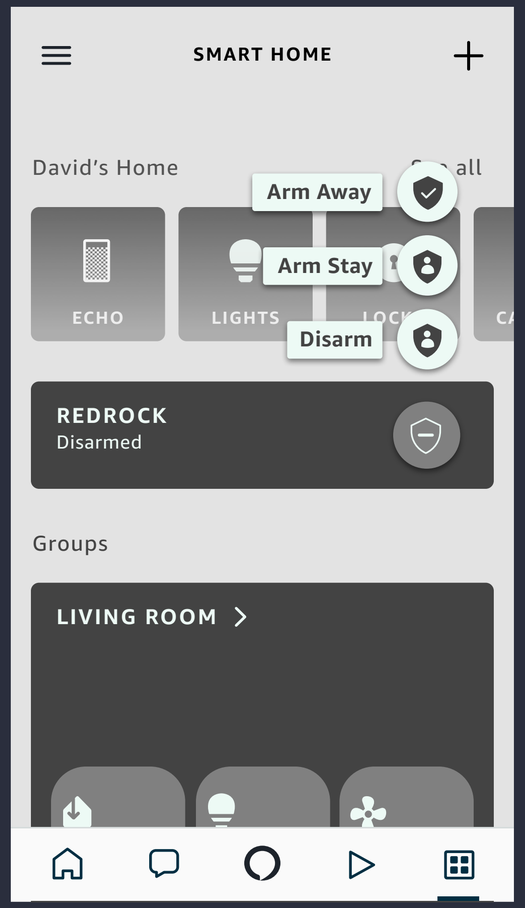
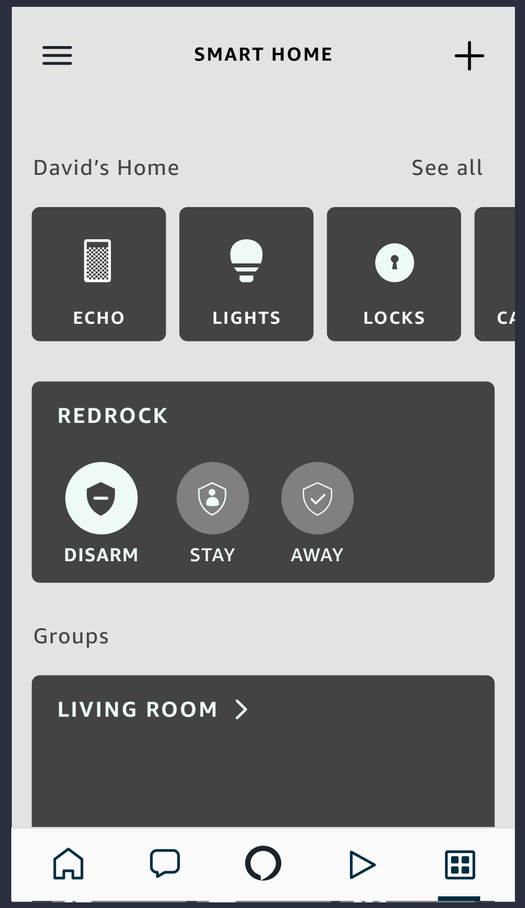
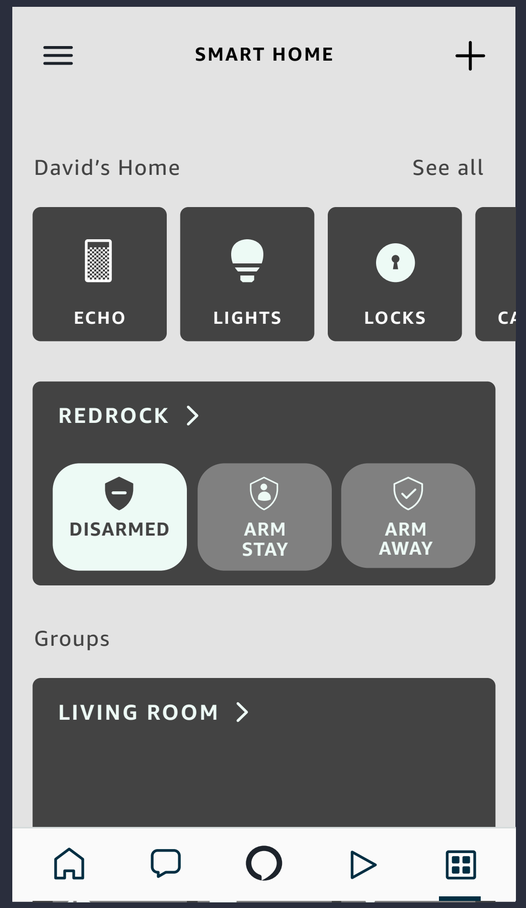
RedRock Bundle Setup flow

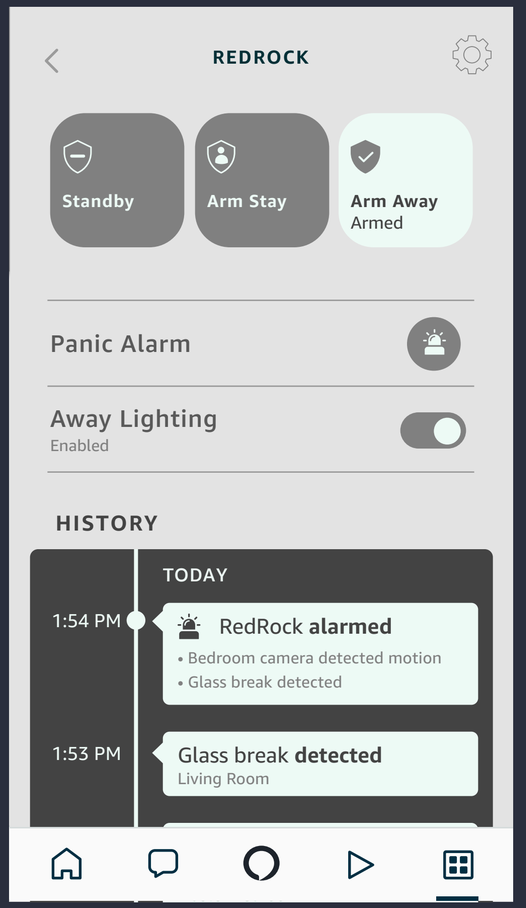


Early Explorations: Exploring RedRock controls on the devices channel



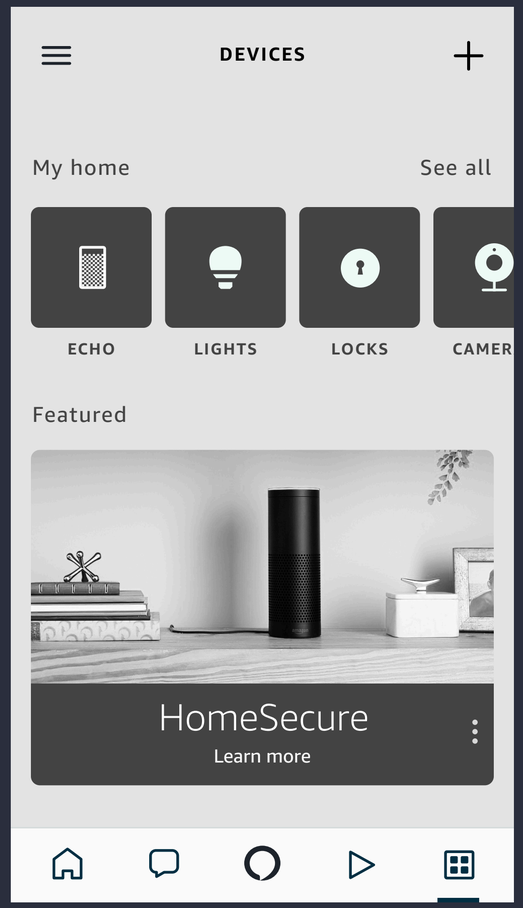




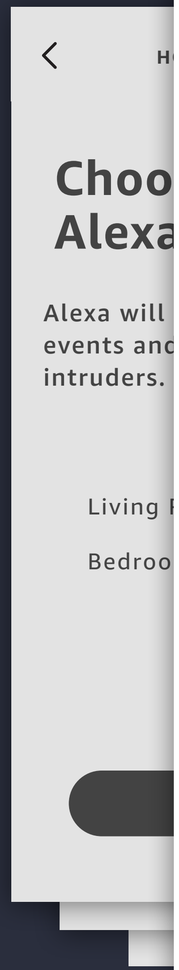


Usability Testing - **7 Users**

REDROCK SETUP







Redrock Research Objectives

1. Can customers quickly understand the information architecture of their settings of Redrock?
2. Do customer understand an correctly associate each sound detection signal to the correct mode (e.g., smoke & CO detection for home and away, human presence for away)?
3. Are customers successful in removing and adding a device from Redrock?
4. Do customers easily understand which devices are in Redrock?
5. Do customers understand the functions of each feature in Redrock (e.g., Cloud verification, share with security partner)?

Proposed Task List

1. Imagine you don't want your patio light to be part of Away Lighting
   Task: Remove patio light from Redrock
2. Imagine you have a new Echo Device that you need add in Redrock.
   Task: Add Kitchen Echo to Redrock
3. Imagine you have parents home, and you want to temporary inactivate Redrock
   Task: Temporally make Redrock inactive.

INTERACTIVE PROTOTYPE - PRINCIPLE

May 2018

We acquired Ring.

“Ring is launching a home security system later this summer (2018).”

- Redefine initial core MLP for RedRock.

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1. RedRock is the **Alexa intelligence that assists with peace of mind, safety, and security.** It is not a full home security system.

2. Initial core MLP for RedRock centered only on AED signals.

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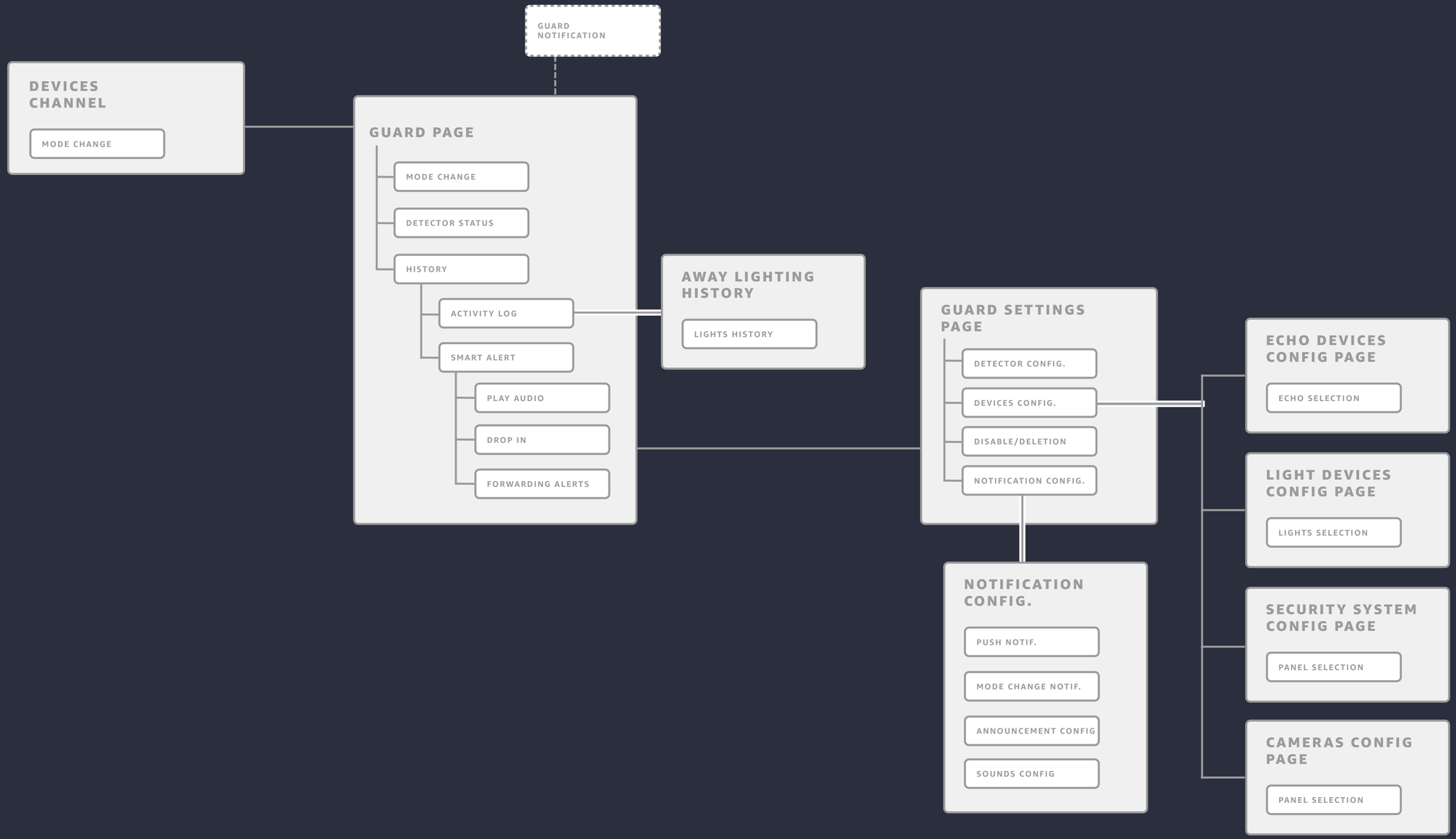
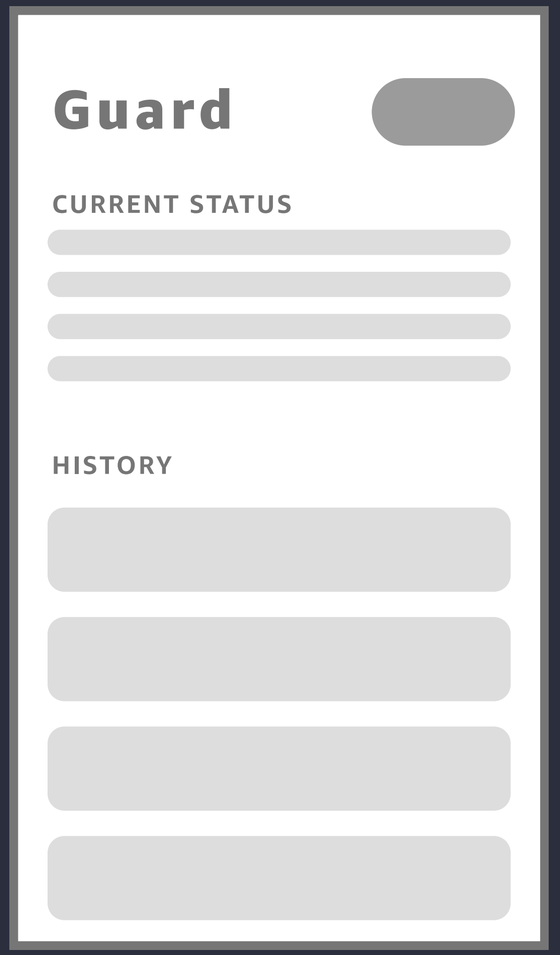
Information Architecture

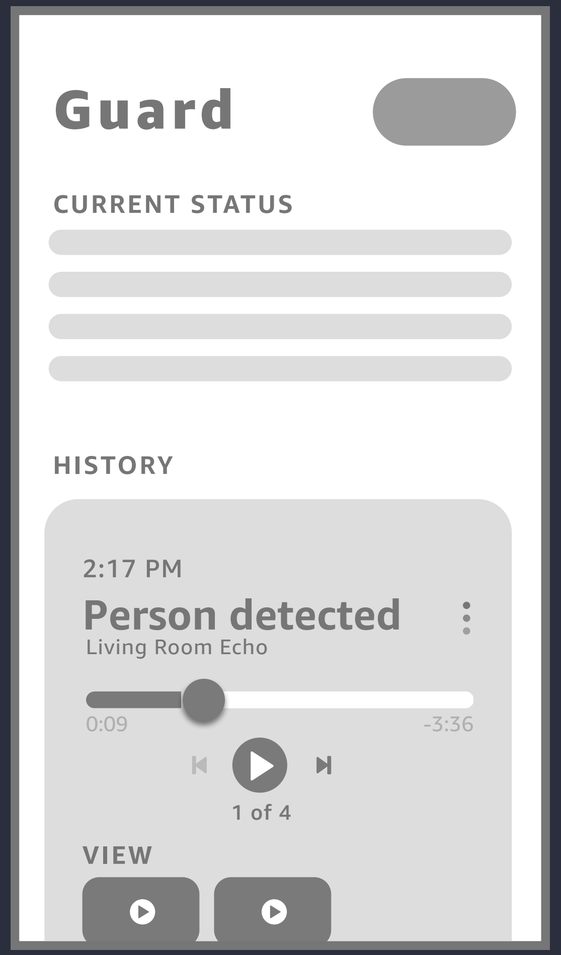


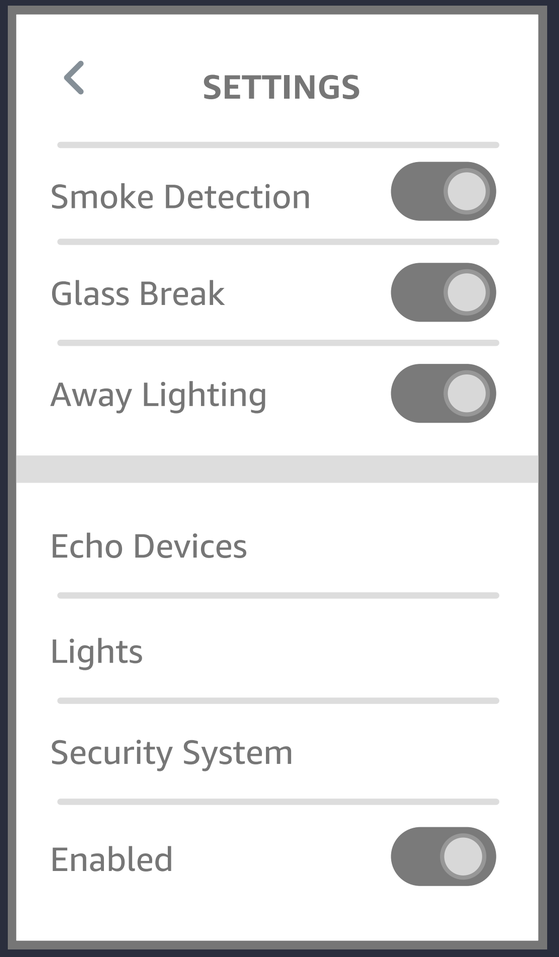
Redefined MLP

Low-fidelity wireframes









War Room

Iteration

Sharing design options with the core team



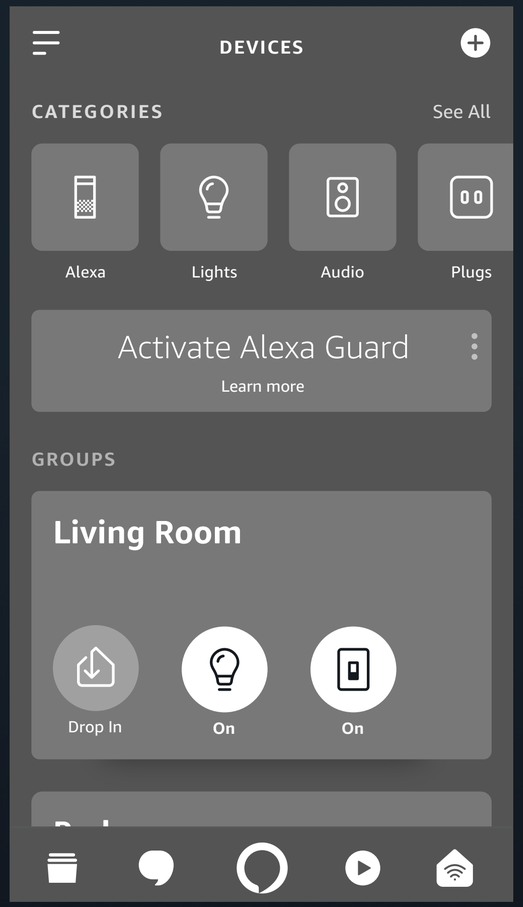
Redefined MLP

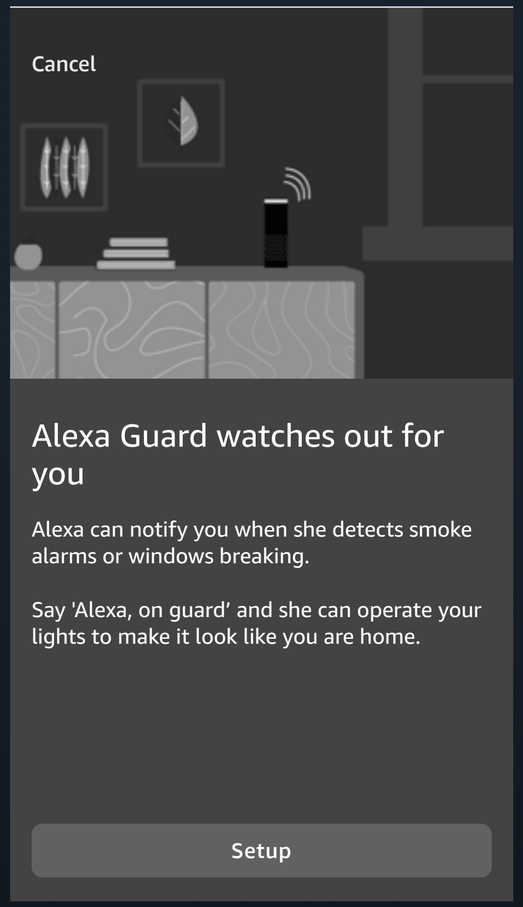
Making tradeoff discussions and decisions

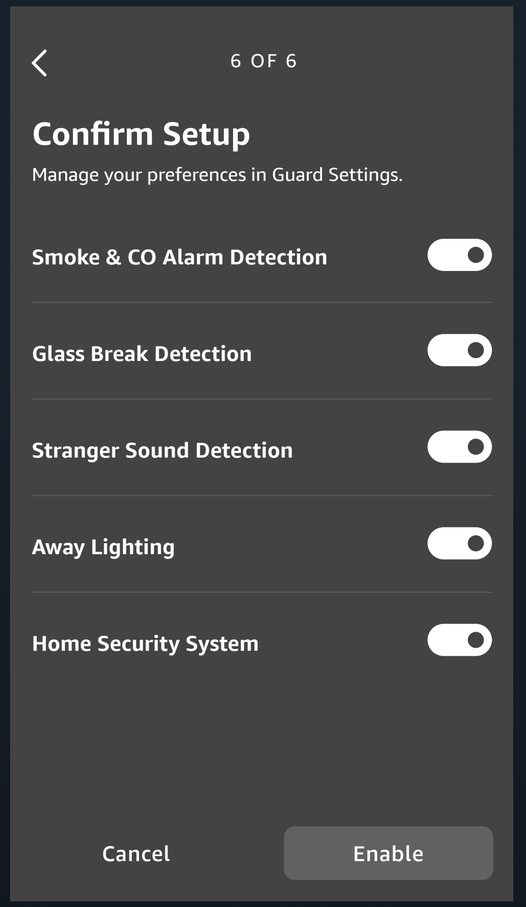


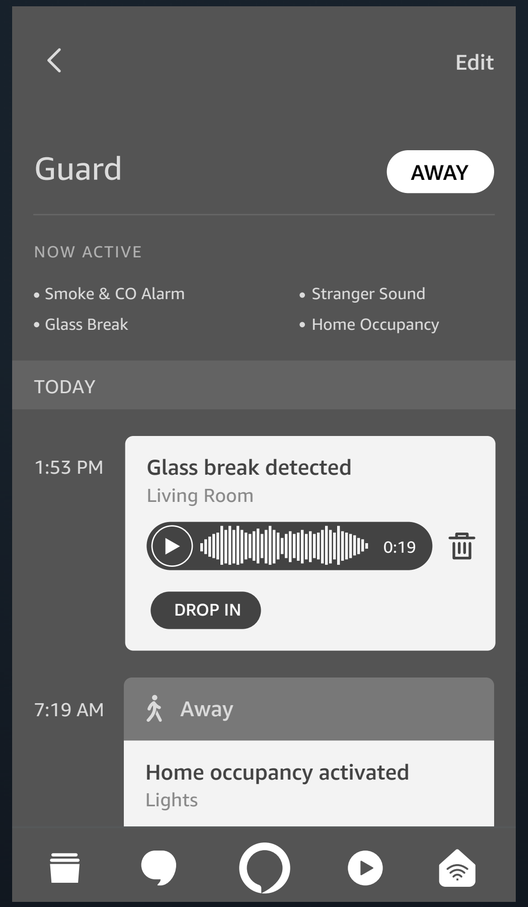
Redefined MLP

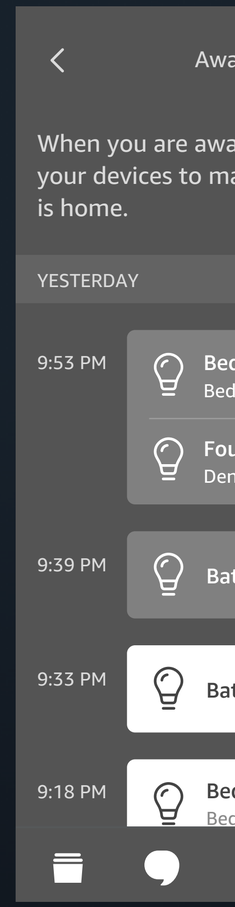
Mid-fidelity wireframes





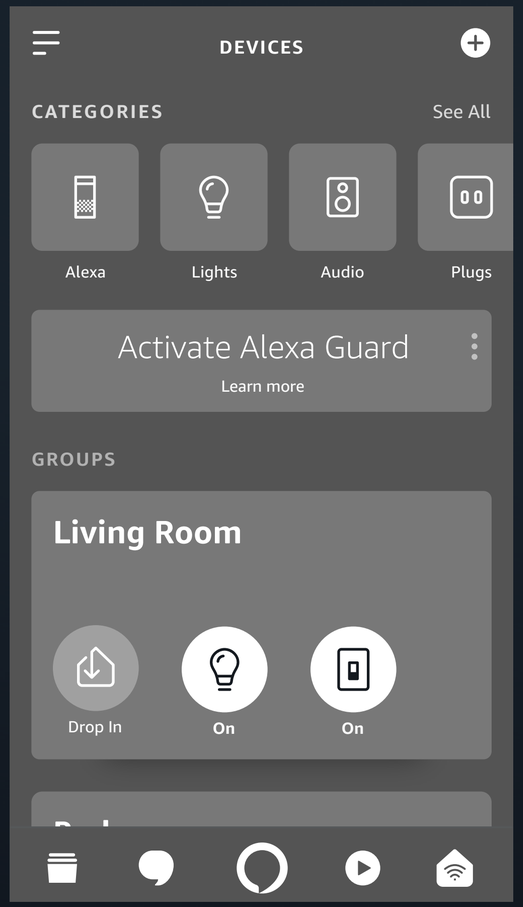


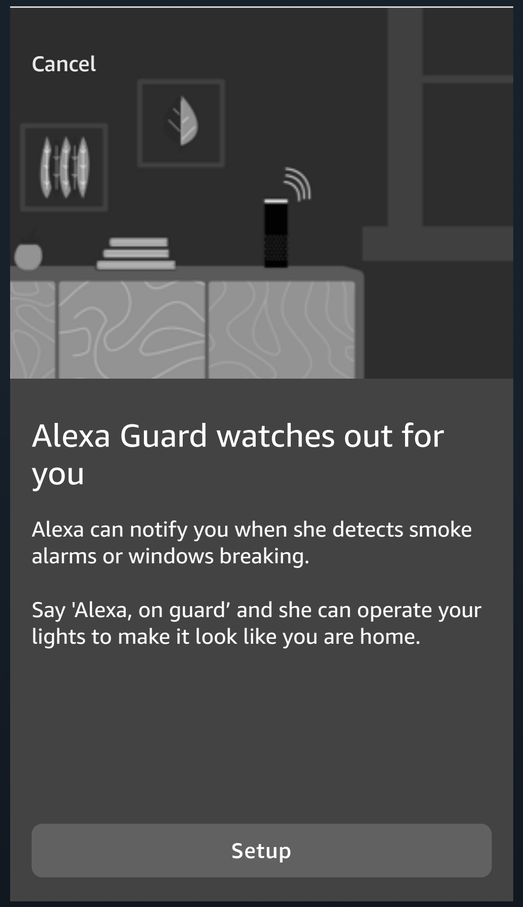


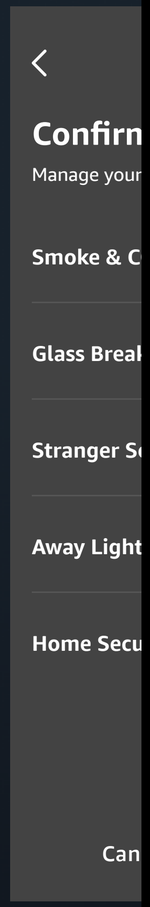


Redefined MLP

Mid-fidelity wireframes







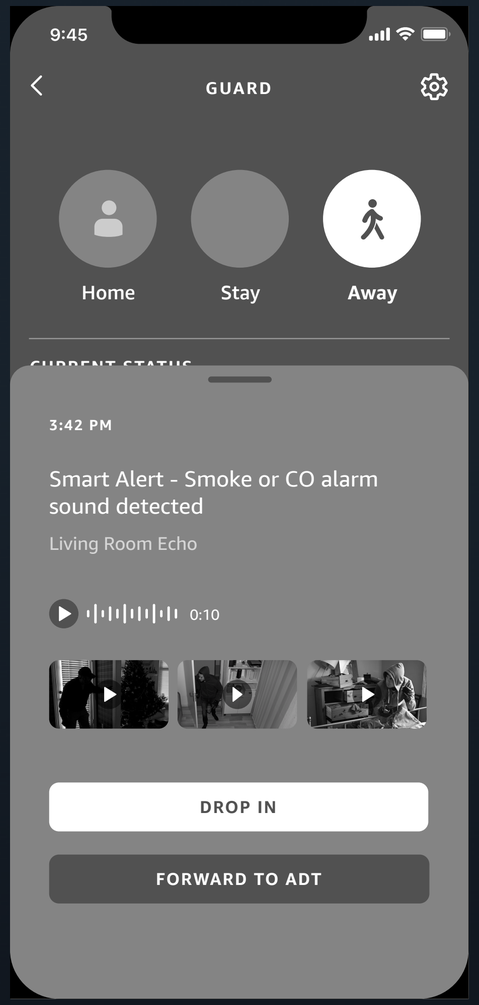
Usability Study

- Do customers understand the actions required to arm their system?
- Can they easily tell what state they are in (e.g., Home-stay, away)?
- How do customers respond to the situation where Alexa won't arm due to an outage (i.e. open window)? How do they expect to manage the situation?
- Can customers easily understand what is in their history of RedRock activities and what actions they can take (e.g., motion detected, AED alerts, etc.)?

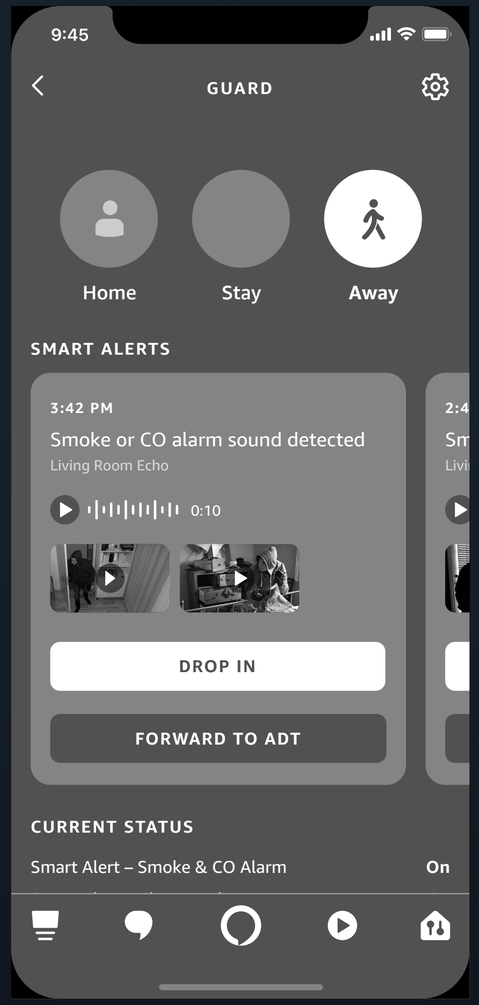
- Do customers understand the actions required to arm their system?
- Can they easily tell what state they are in (e.g., Home-stay, away)?
- How do customers respond to the situation where Alexa won’t arm due to an outage (i.e. open window)? How do they expect to manage the situation?
- Can customers easily understand what is in their history of RedRock activities and what actions they can take (e.g., motion detected, AED alerts, etc.)?

Redefined MLP

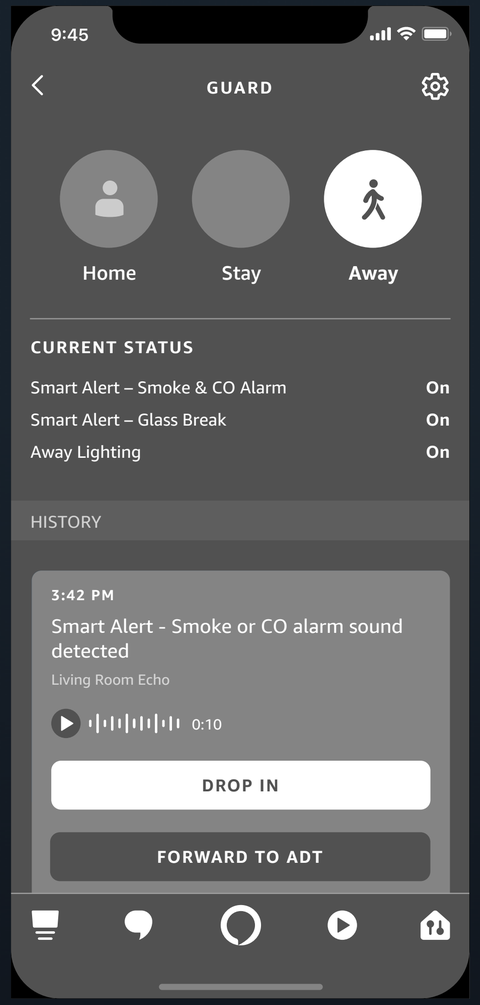
Exploring Smart Alert Interaction



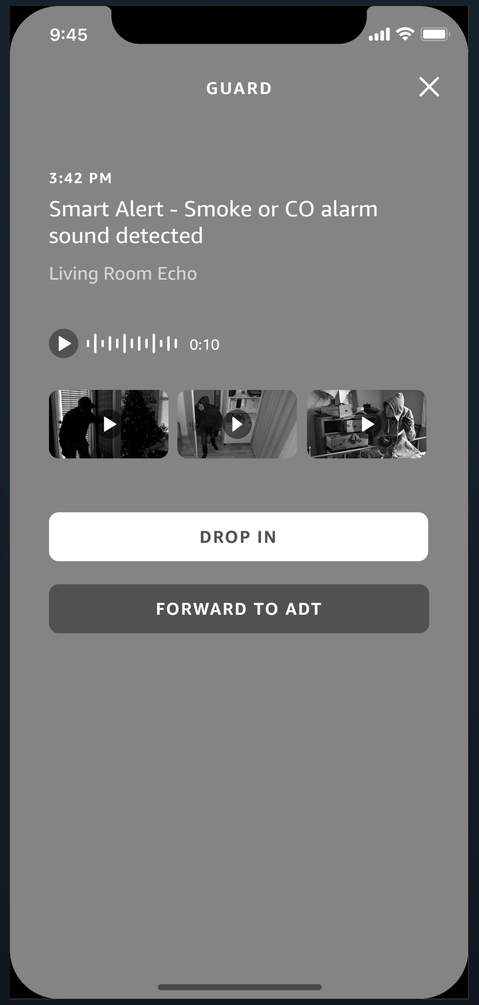
EXPANDING BOTTOM SHEET



CAROUSEL



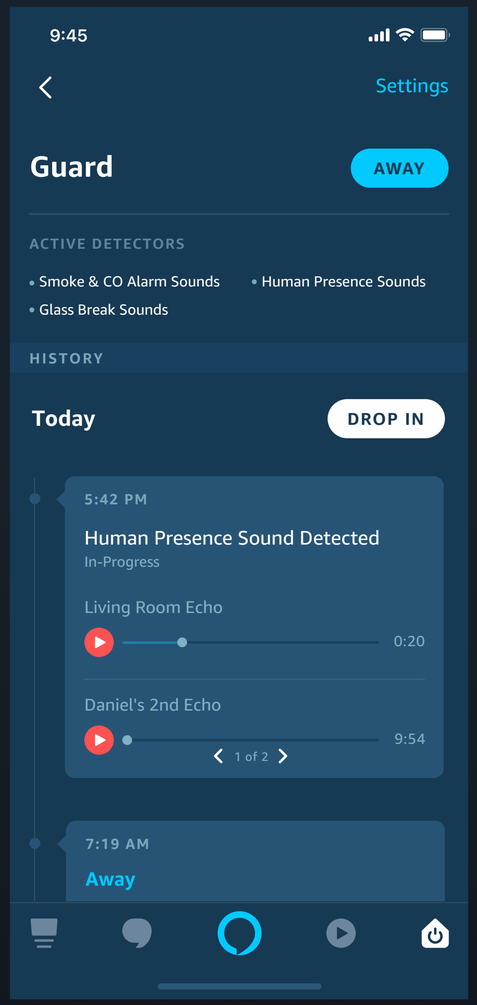
SCROLL IN HISTORY



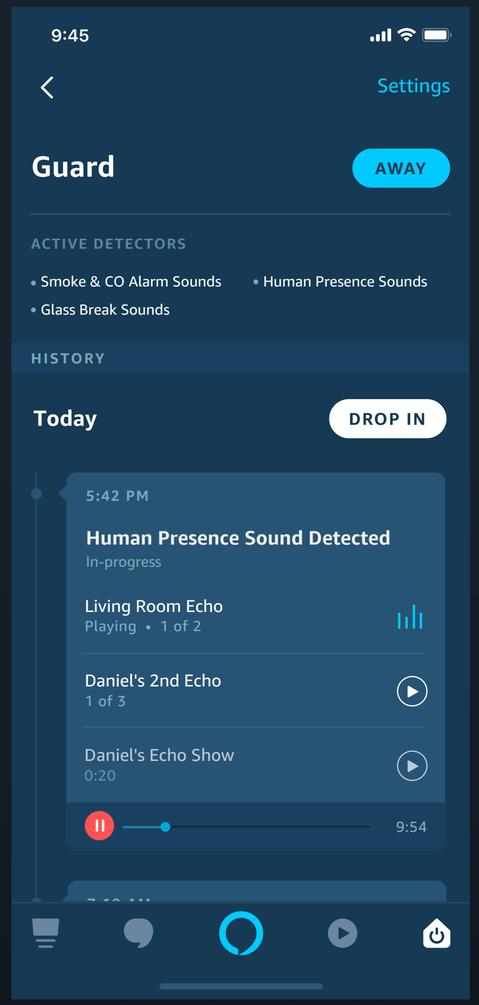
FULL PAGE MODAL

Tech Constraints

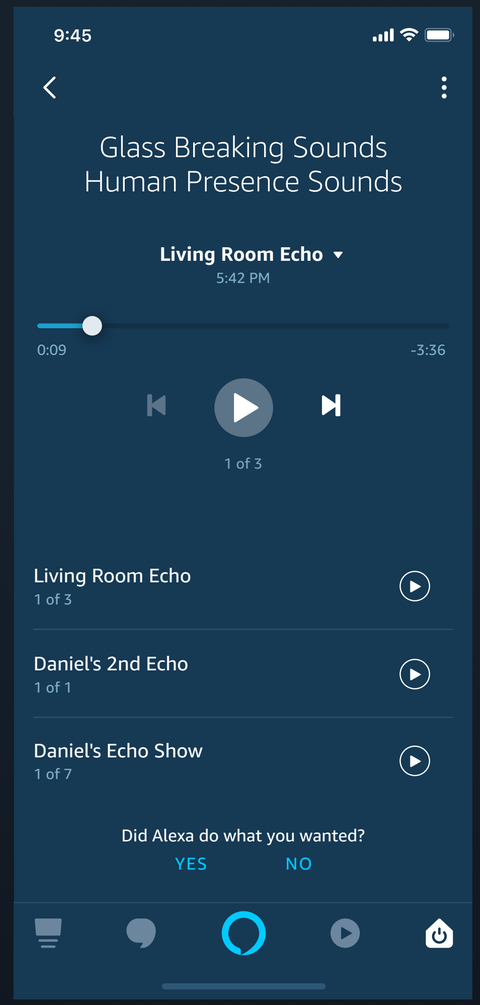
Alexa can record a maximum of 10 seconds



MULTIPLE AUDIO PLAYERS



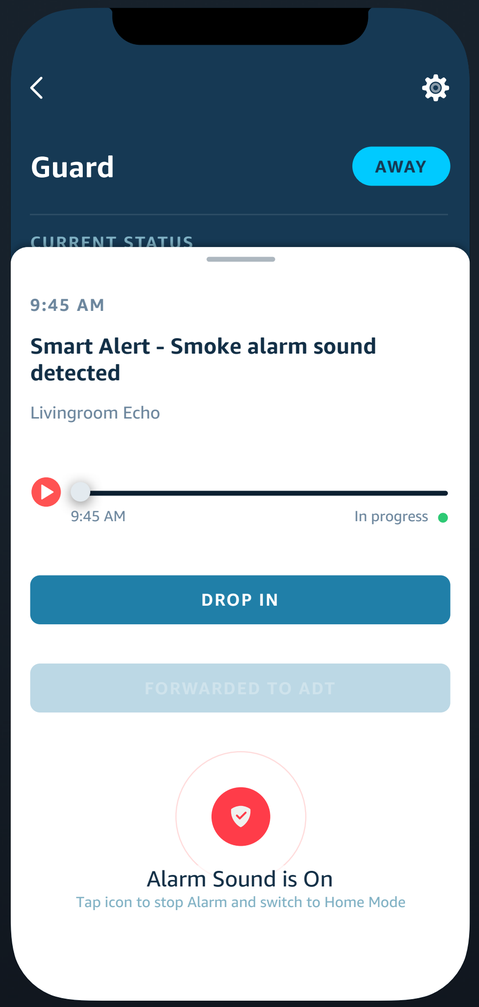
ONE PLAYER PER ALERT

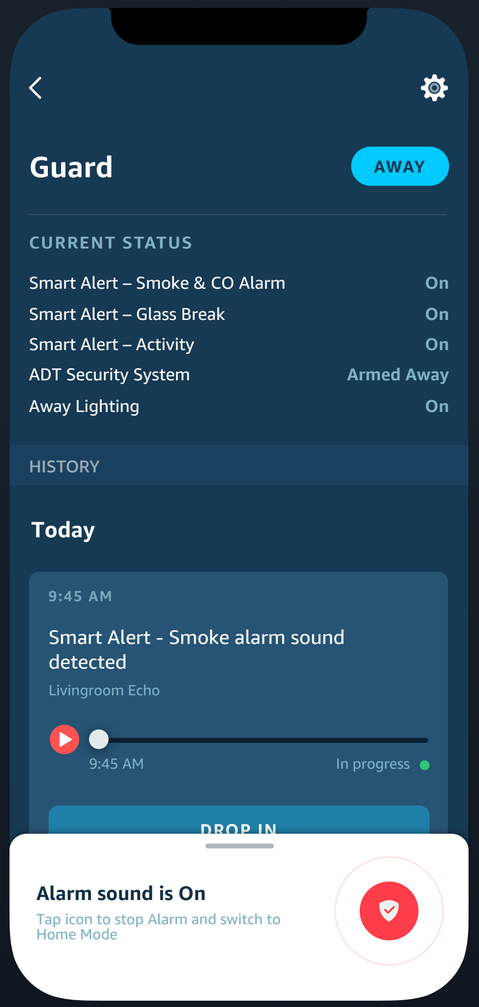


FULL PAGE ALERT

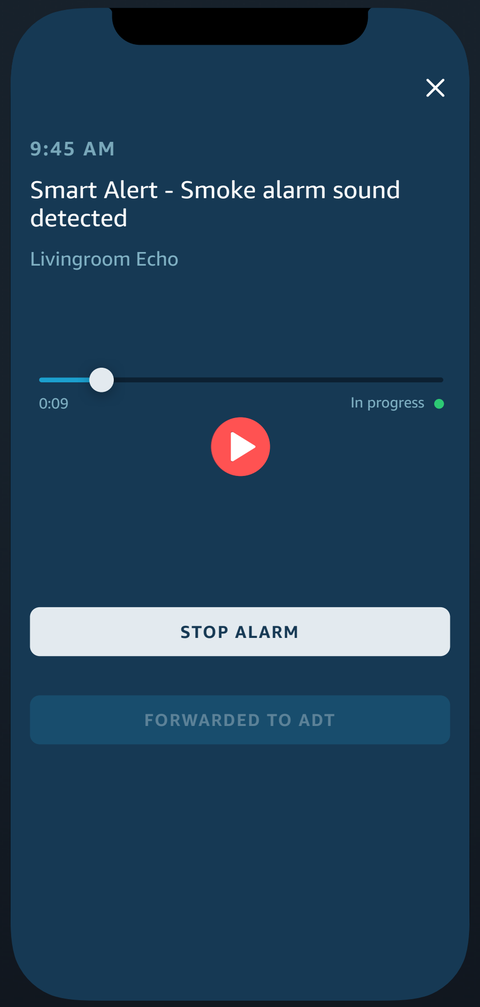
High Fidelity Prototype

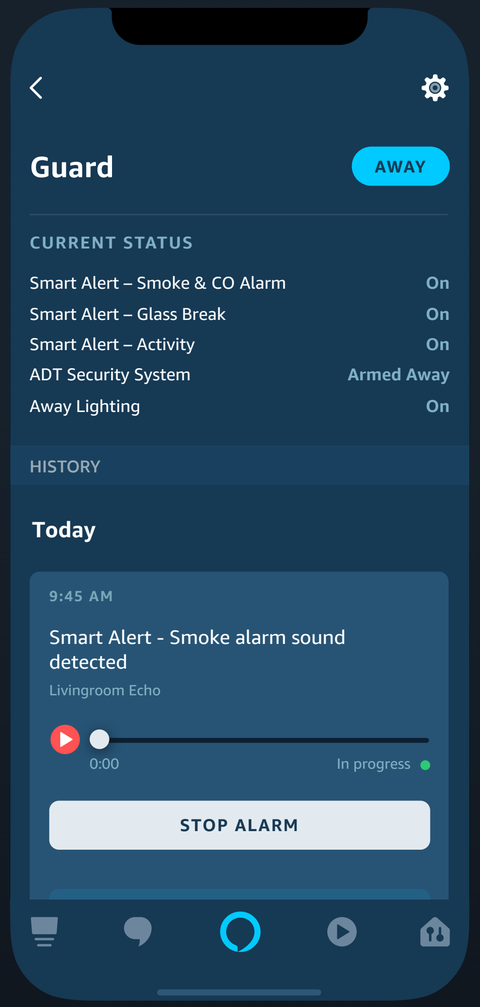
Interacting with Smart Alerts





EXPANDING BOTTOM SHEETS





FULLSCREEN MODAL

VUI Design

Away mode

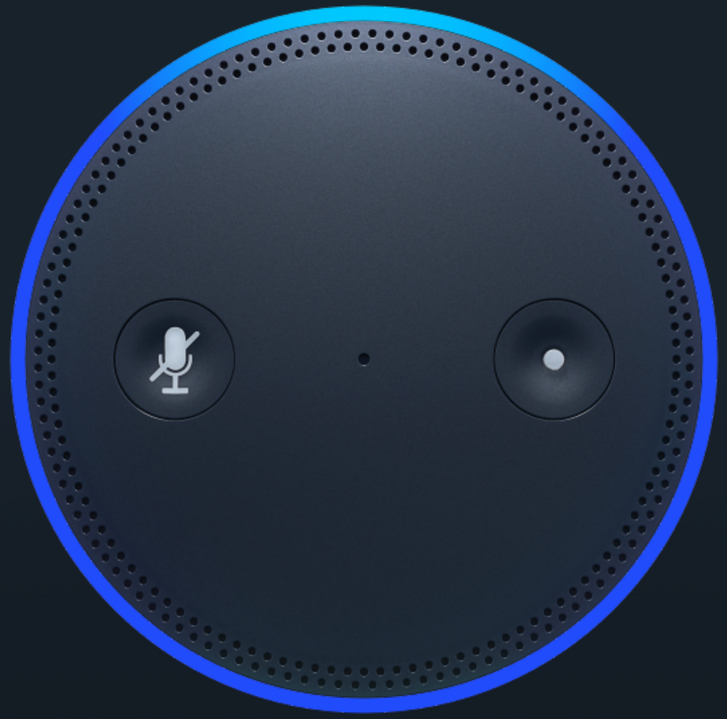
2.1 Customer doesn't have a security panel and turns away mode on - or tries to and away mode is already on

	Dialog	Notes
Customer	Alexa, I'm leaving	
Alexa	See ya later! / Good bye! / Okay. / Alright. / Bye!	Use variants for acknowledgement
Alexa	I'll start guarding now.	

2.2 Customer has a security panel as part of RR and turns away mode on

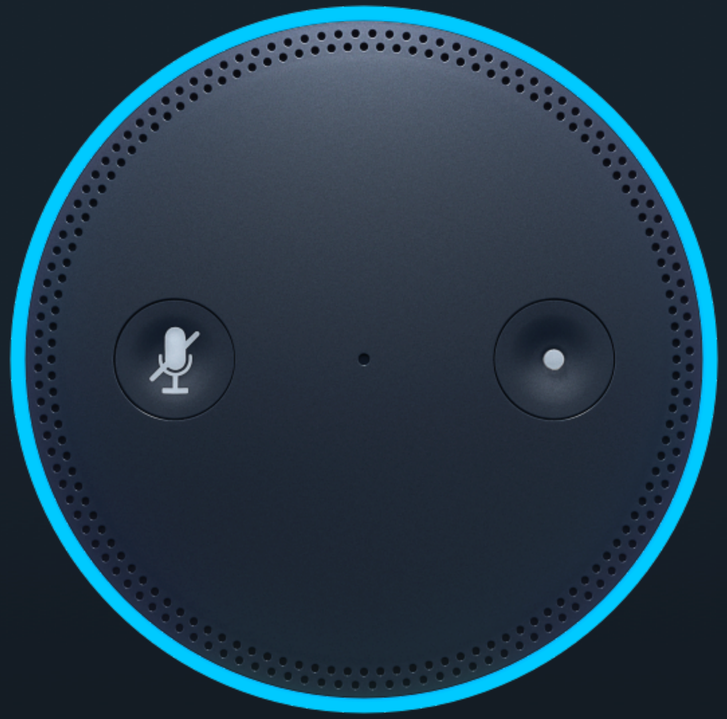
	Dialog	Notes
Customer	Alexa, I'm leaving	
Alexa	See ya later! / Good bye! / Okay. / Alright. / Bye!	Use variants for acknowledgement
Alexa	I'll start guarding now.	
Alexa	${applianceName} is armed in ${mode} mode. OR ${applianceName} is armed in ${mode} mode. You have ${x} seconds to exit.	Re-use security panel arm confirmations, variable depending if appliance includes an arming delay.

“Alexa, I’m Home.”

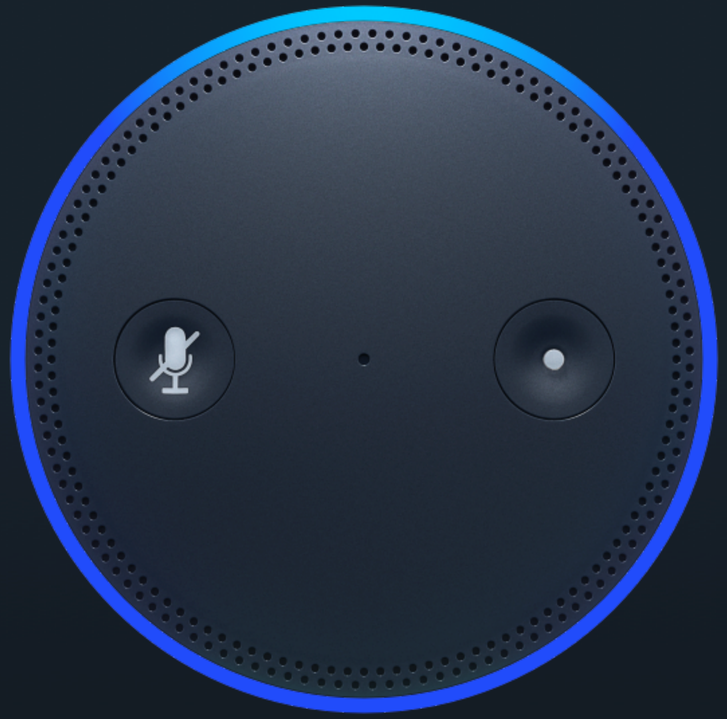


Welcome Home. By the way, Guard can now detect intruder sounds.

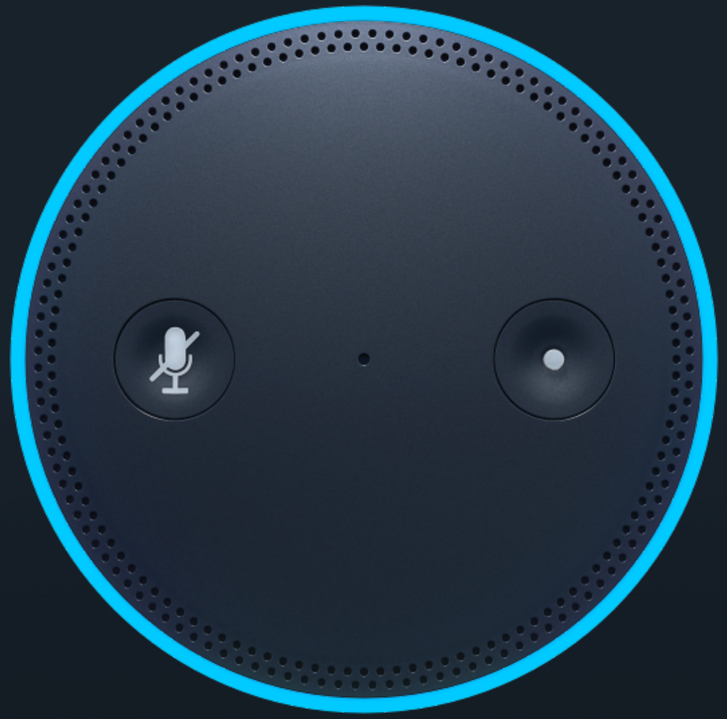
Would you like to add Intruder sound Smart Alerts to Guard?



“Yes, please”



Intruder sound detection is enabled.

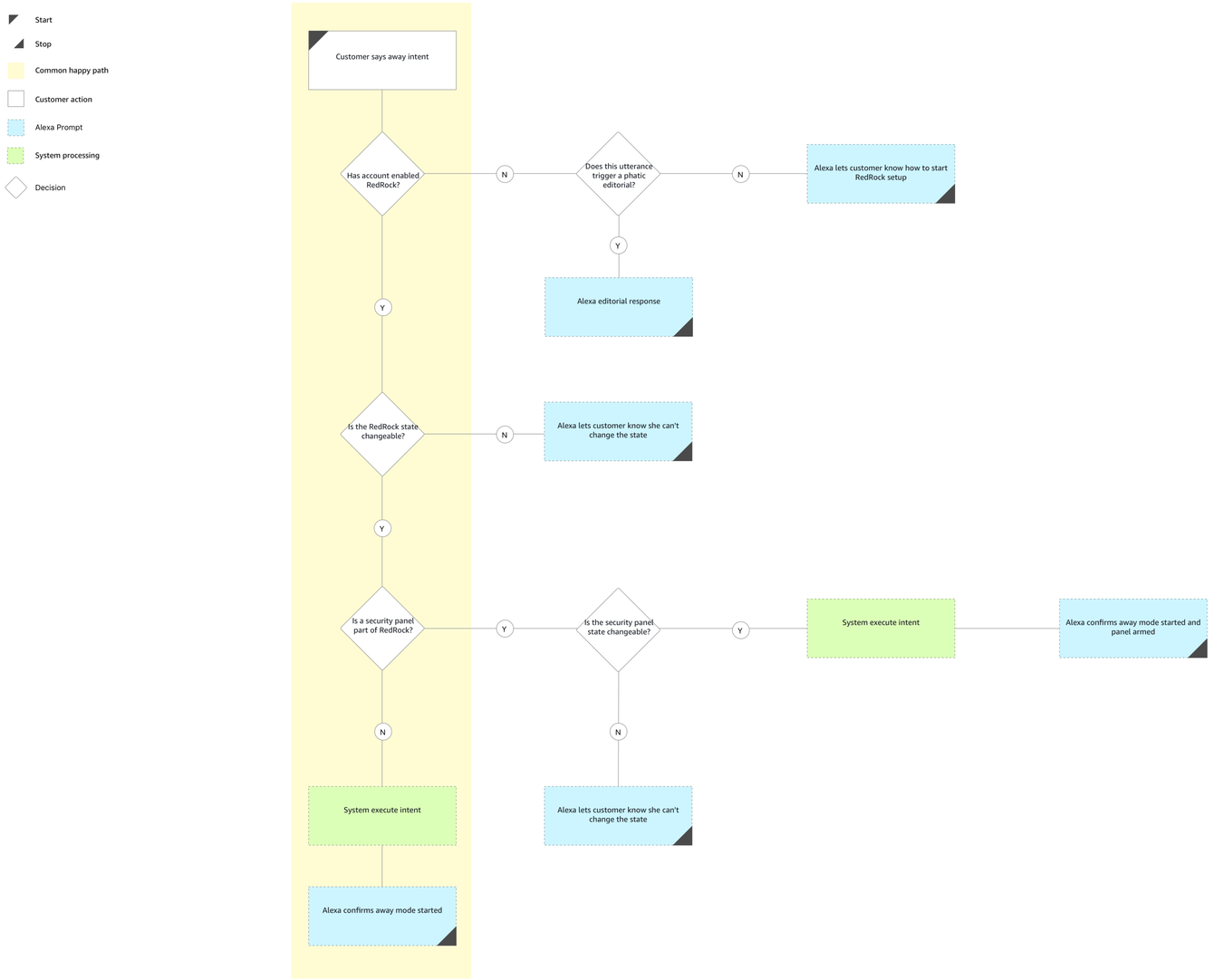


VUI Design

Start away mode VUI flow diagram

START AWAY MODE LOGIC FLOW

VUI

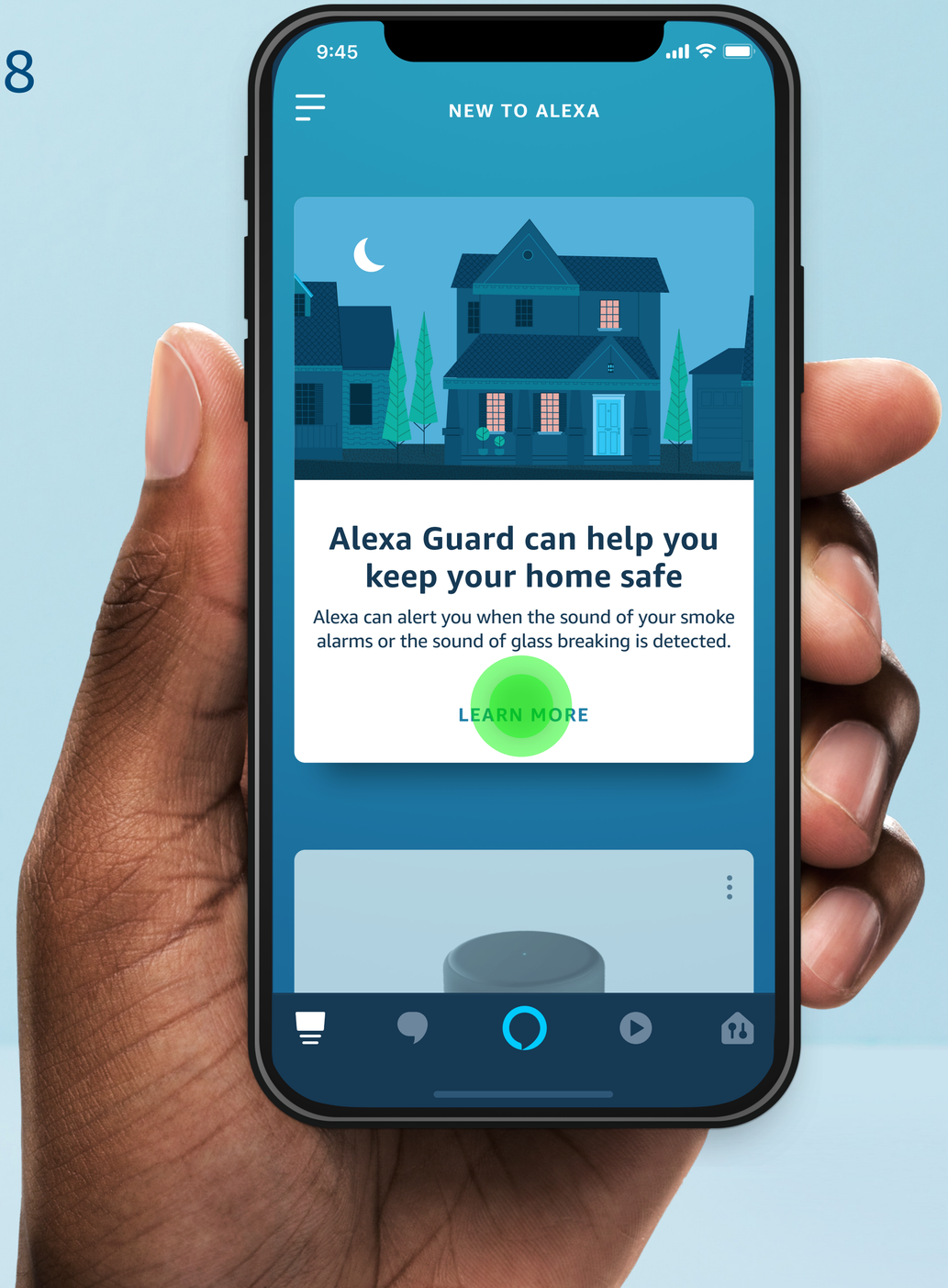


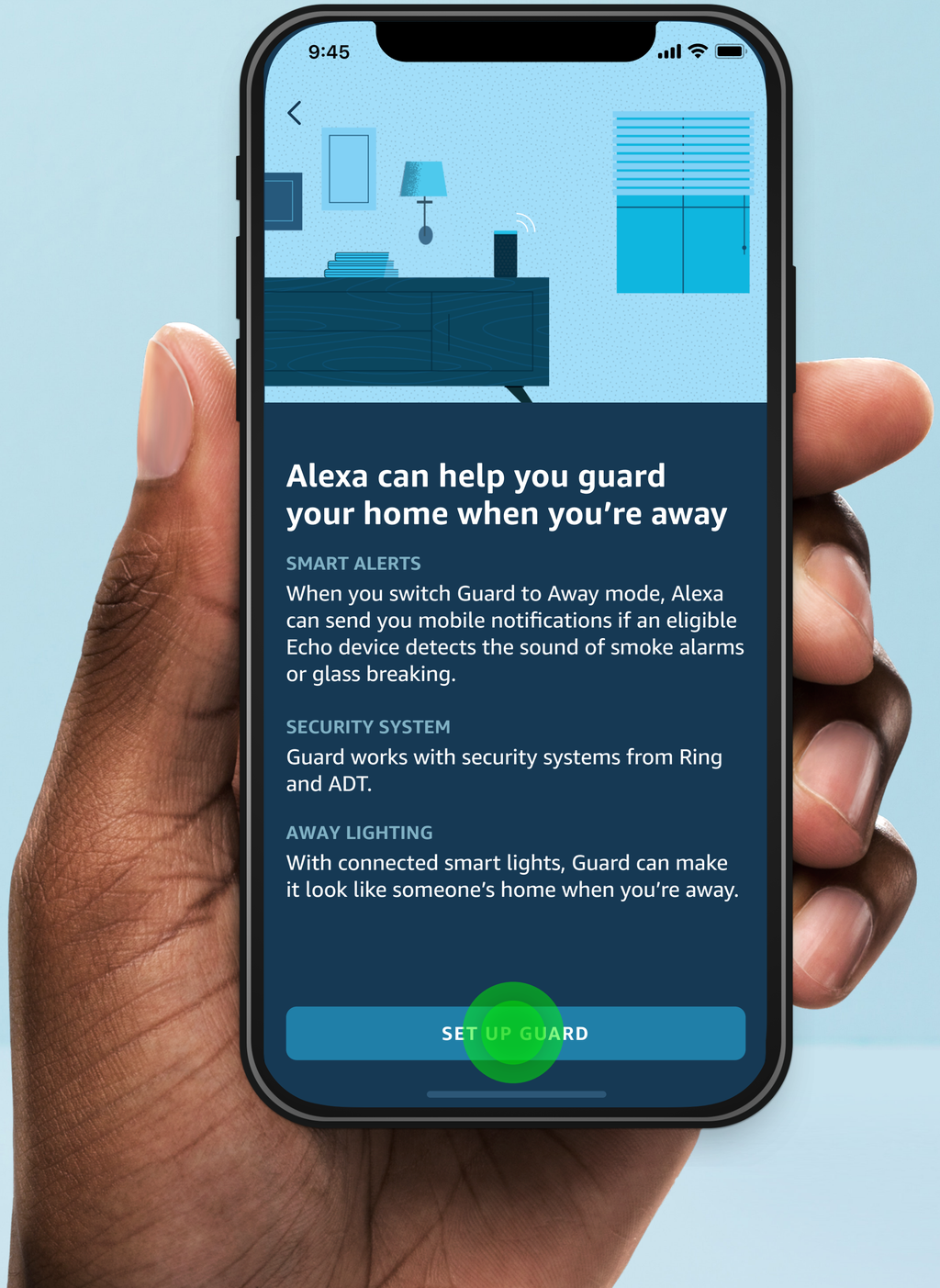
AMAZON PRIVILEGED & CONFIDENTIAL

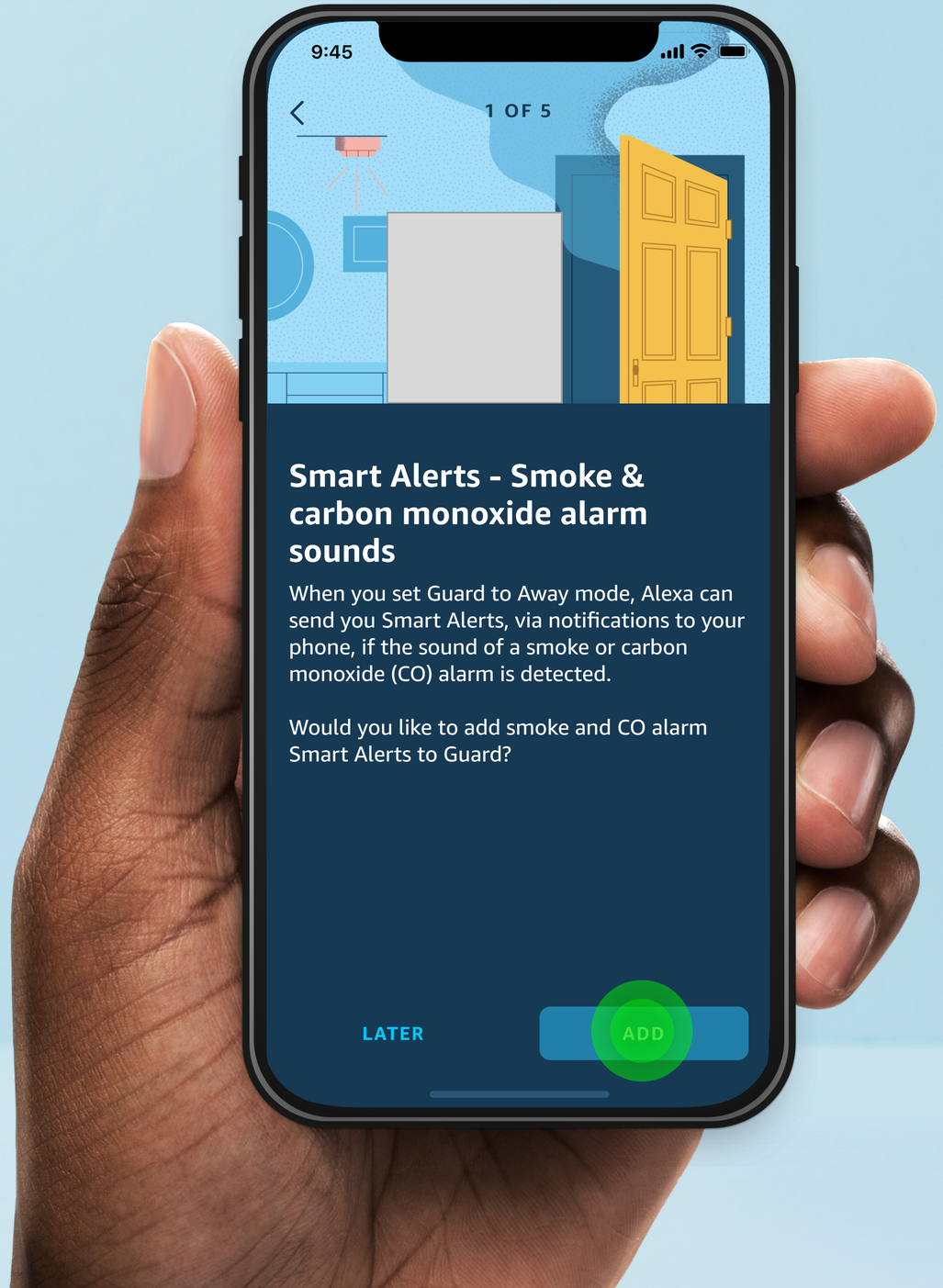

09.20.18
SEATTLE, WA
Alexa Guard
c|net

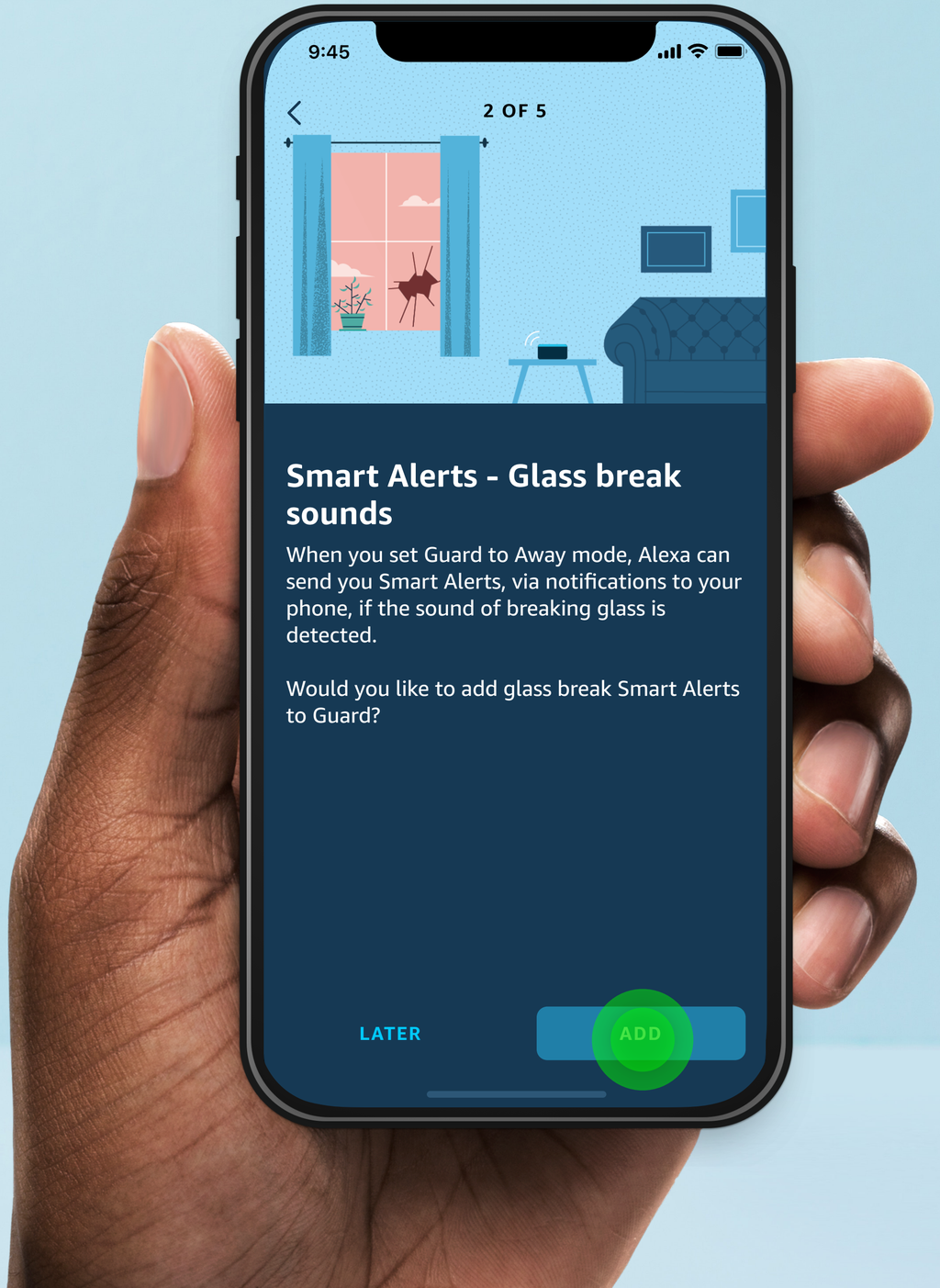
Public Beta - Dec 2018

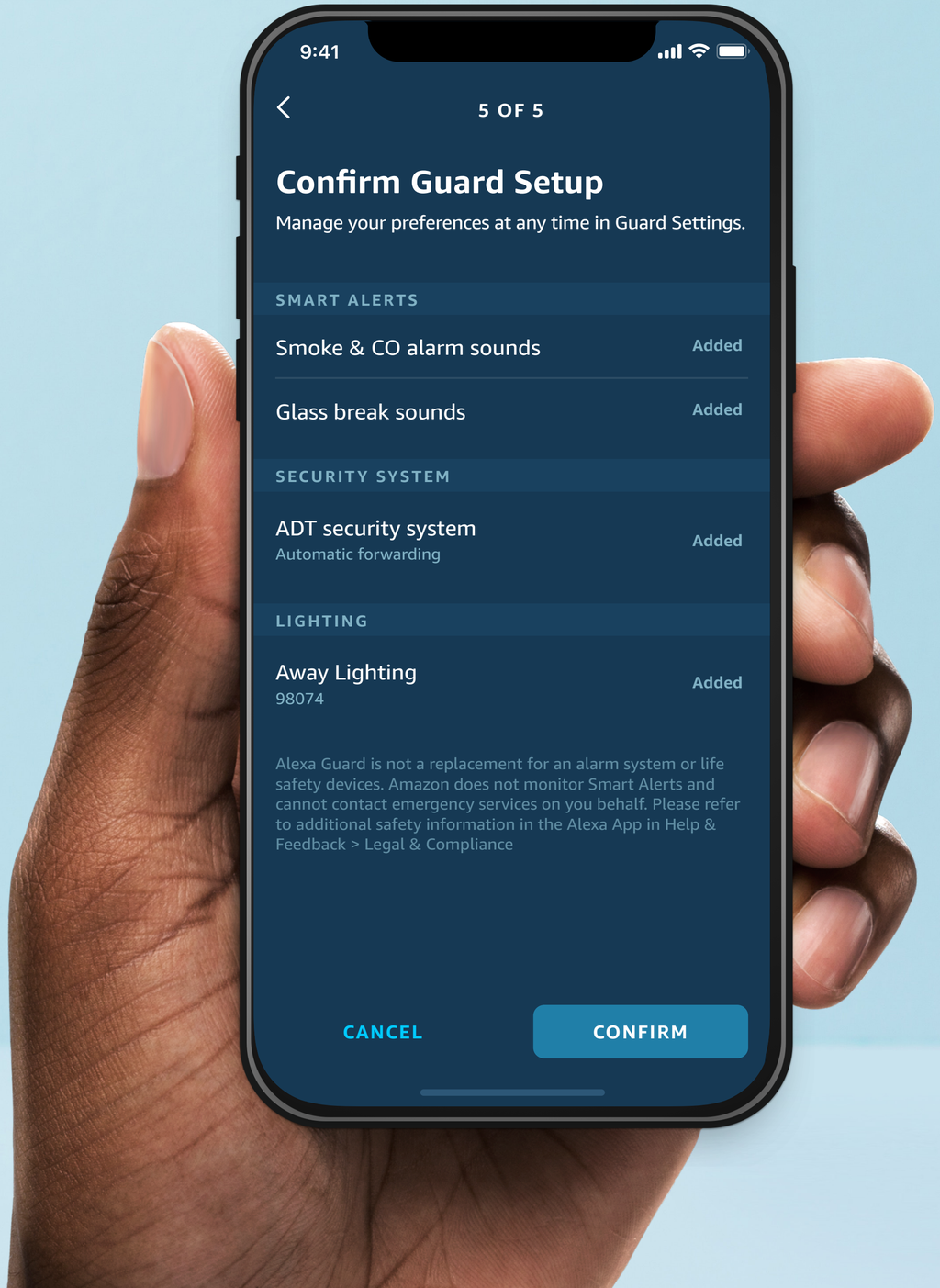
Invite only release



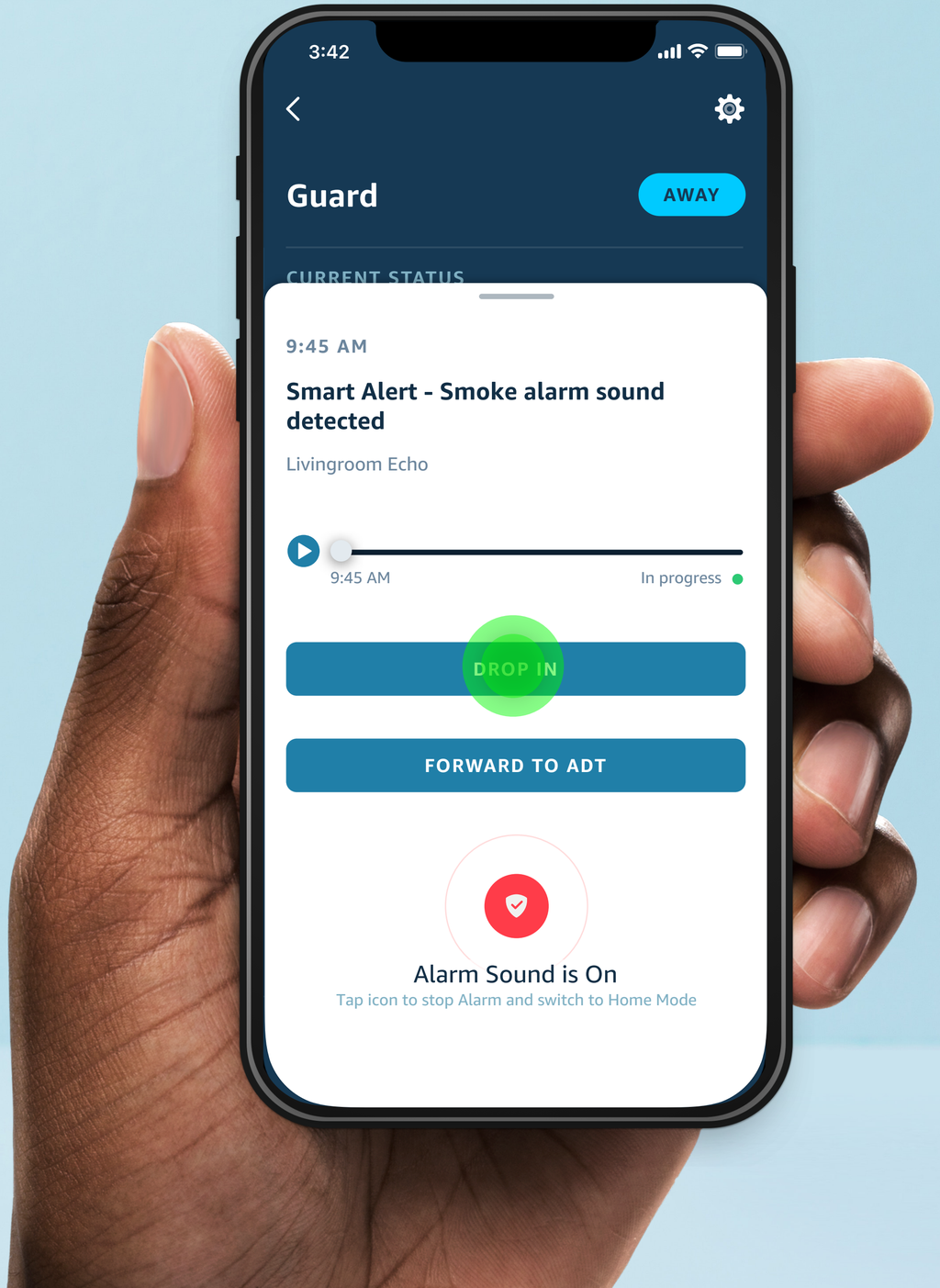

9:45
Alexa can help you guard your home when you're away
SMART ALERTS
When you switch Guard to Away mode, Alexa can send you mobile notifications if an eligible Echo device detects the sound of smoke alarms or glass breaking.
SECURITY SYSTEM
Guard works with security systems from Ring and ADT.
AWAY LIGHTING
With connected smart lights, Guard can make it look like someone's home when you're away.
SET UP GUARD


9:45
1 OF 5
Smart Alerts - Smoke & carbon monoxide alarm sounds
When you set Guard to Away mode, Alexa can send you Smart Alerts, via notifications to your phone, if the sound of a smoke or carbon monoxide (CO) alarm is detected.
Would you like to add smoke and CO alarm Smart Alerts to Guard?
LATER
ADD


9:45
2 OF 5
Smart Alerts - Glass break sounds
When you set Guard to Away mode, Alexa can send you Smart Alerts, via notifications to your phone, if the sound of breaking glass is detected.
Would you like to add glass break Smart Alerts to Guard?
LATER
ADD


9:41
5 OF 5
Confirm Guard Setup
Manage your preferences at any time in Guard Settings.
SMART ALERTS
Smoke & CO alarm sounds
Added
Glass break sounds
Added
SECURITY SYSTEM
ADT security system
Automatic forwarding
Added
LIGHTING
Away Lighting
98074
Added
Alexa Guard is not a replacement for an alarm system or life safety devices. Amazon does not monitor Smart Alerts and cannot contact emergency services on you behalf. Please refer to additional safety information in the Alexa App in Help & Feedback > Legal & Compliance
CANCEL
CONFIRM


9:45
Thursday, September 6
AMAZON ALEXA
now
Smart Alert - Smoke alarm sound
Possible smoke alarm sound detected on Livingroom Echo.


3:42
Guard
AWAY
CURRENT STATUS
9:45 AM
Smart Alert - Smoke alarm sound detected
Livingroom Echo
9:45 AM
In progress
DROP IN
FORWARD TO ADT
Alarm Sound is On
Tap icon to stop Alarm and switch to Home Mode


3:42
00:10



SMART ALERT EXPERIENCE

Customer sentiments - Reddit

POSTED BYU/FIRE_ECHO

“I was at a family event when someone broke into my house this morning. Thanks to Amazon Alexa and some smart cameras, suspects are now in custody by local police.”

LEVEL 1 LIMITLESS

“Let Amazon know, they'll be giddy that **this feature actually got results** and hopefully start rolling this out more widely.”

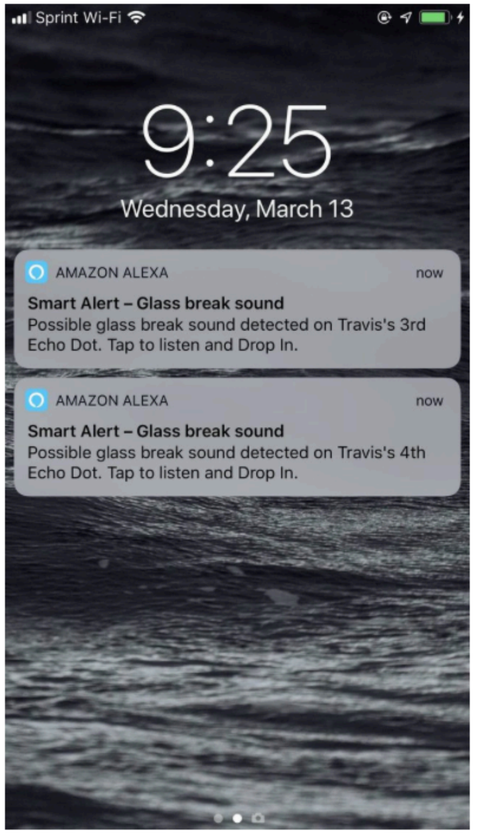
Posted by u/fire_echo 19 days ago

463

I was at a family event when someone broke into my house this morning. Thanks to Amazon Alexa and some smart cameras, suspects are now in custody by local police.

i.imgur.com/ROcPp4...

Feature



78 Comments Share Save

What are your thoughts? Log in or Sign up

LOG IN SIGN

SORT BY BEST

limitless__ 182 points · 19 days ago

Let Amazon know, they'll be giddy that this feature actually got results and hopefully start rolling this out more widely.

Reply Share Report Save

daemonslye 77 points · 19 days ago

I wish I knew what it took to be a “select customer. “ I have almost a dozen Alexa devices in my house and have been waiting for this feature since last September.

Reply Share Report Save

Public Launch - May 14th 2019

- Over **70K new customers** joined in the **morning of the release**
- Spike in traffic at 2 PM due to EMWA emails - **1.5 customers/sec**
- **Over 33 articles** featuring Alexa Guard on the release date - Including CNN, TechCrunch, Digital Trends, The Verge, Engadget, USA Today and CNET



Alexa Guard provides safety, security, and peace of mind to:

~1M Alexa Guard customers

~ 220K daily active users (DAU)

~ 650K monthly active users (MAU)

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What we've learned

~ 26% of users forget to switch modes

~ Engagement falls after 3 months

P1 Features

1. Automation mechanism

- Routines (Time

- Geo Fencing

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PASCUAL

Computer Vision

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How can we improve the experience of our smart home customer who own cameras?

- 82% of the customers turn off camera motion notifications (chatty)

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CSUN accessibility conference

For our blind customers Computer Vision is about **providing a more equal experience** to that of a sighted customer. A more equal experience gives this customer cohort a **stronger sense of independence, empowerment, and confidence**.

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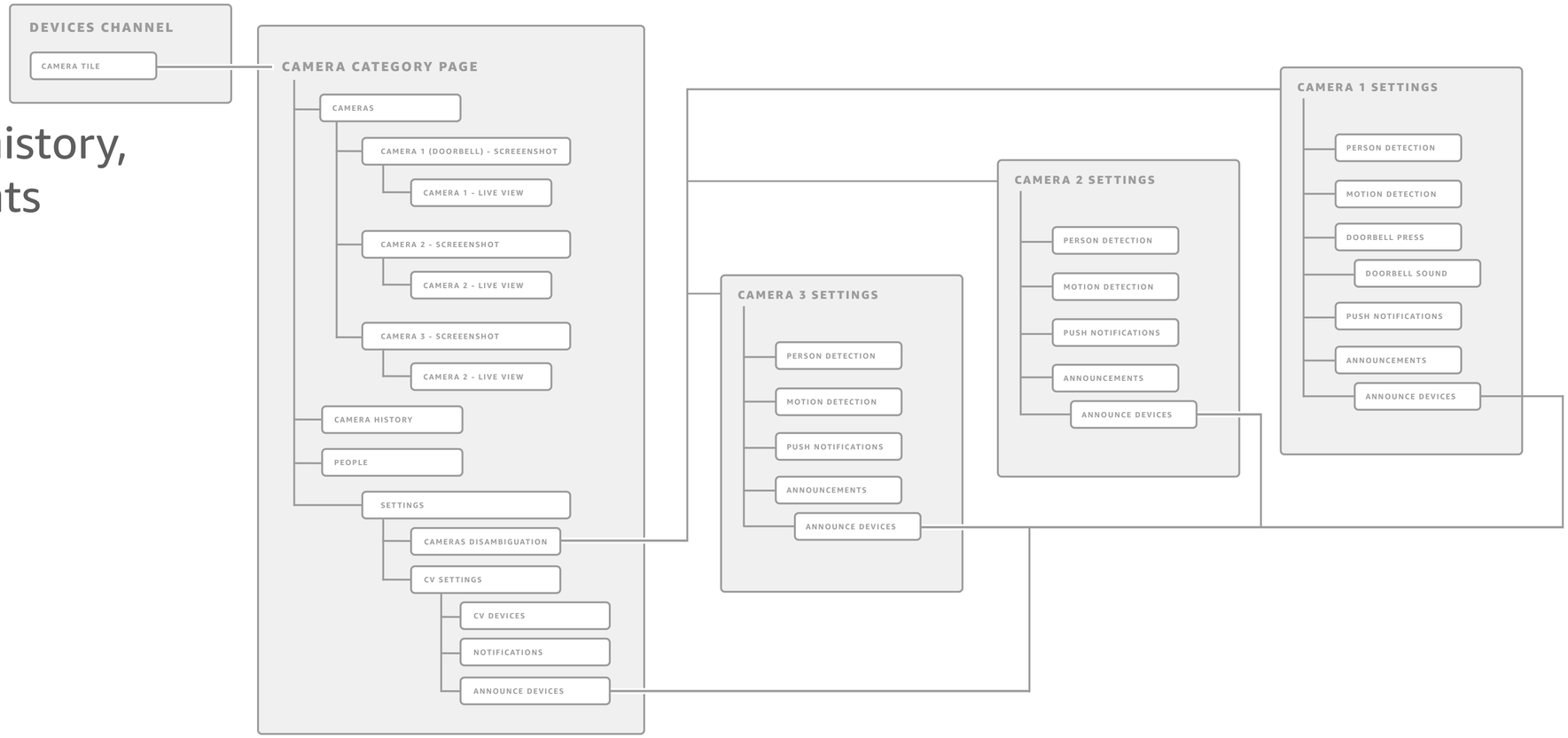
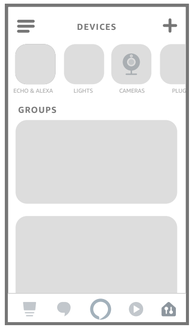
OPTION 1

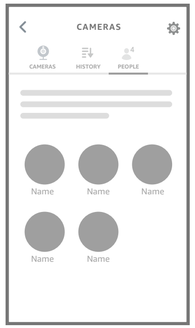
IA - Camera devices **dashboard** with centralized history, notifications & announcements

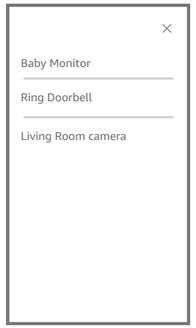










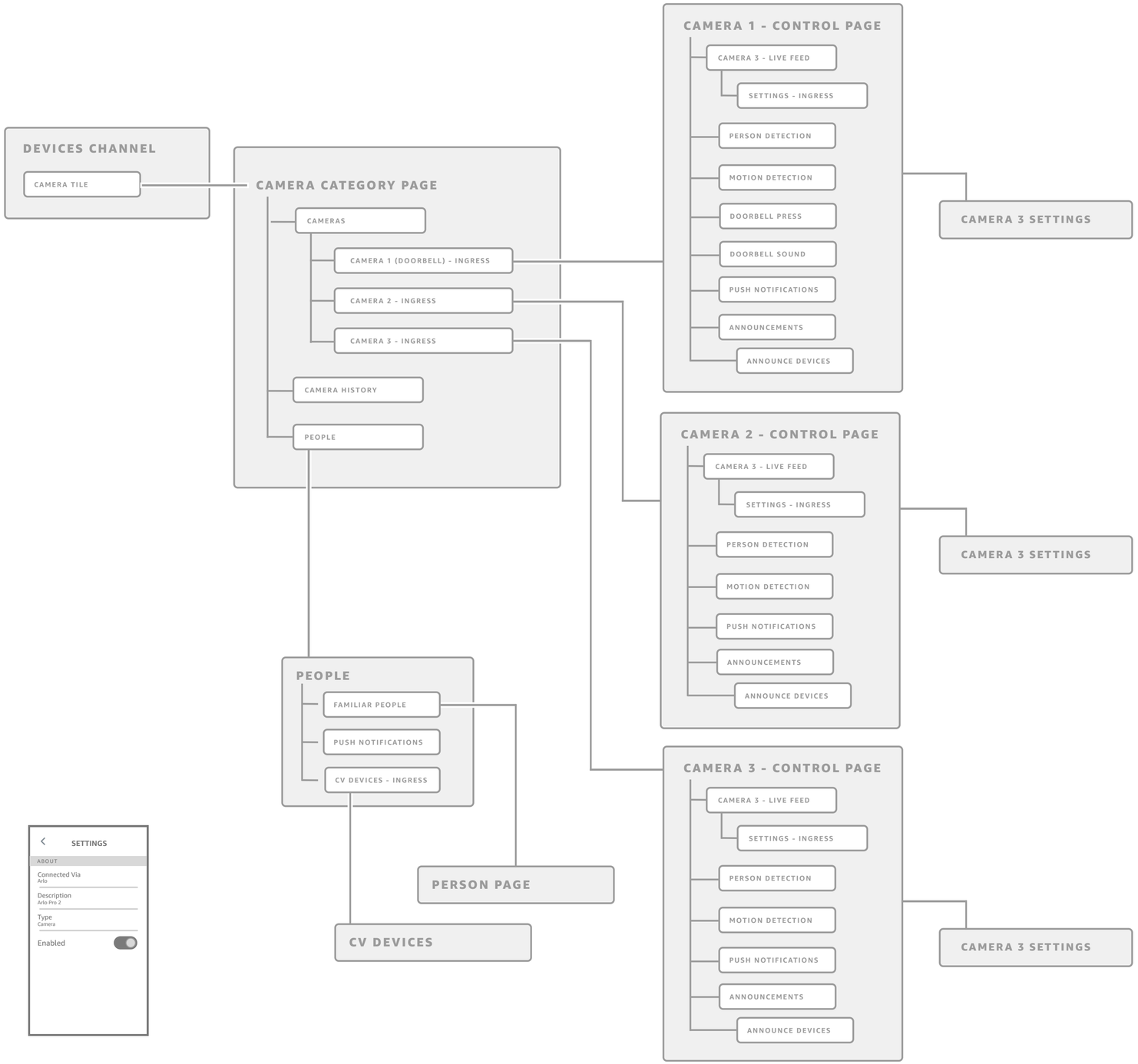


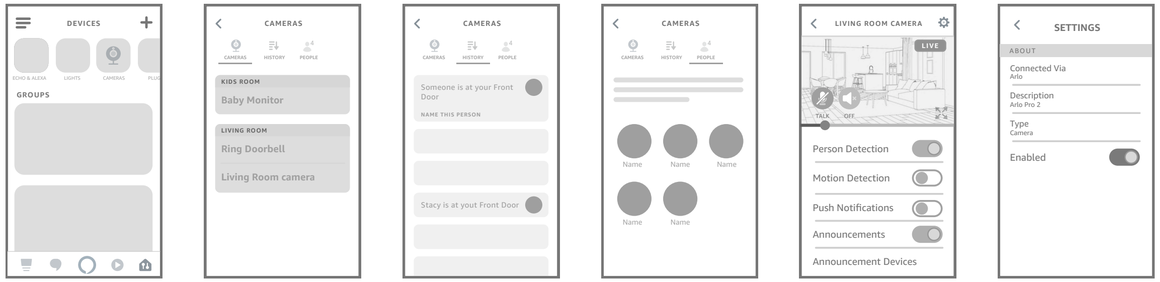


OPTION 2

IA - Single camera feed view

Centralized history, notifications & announcements

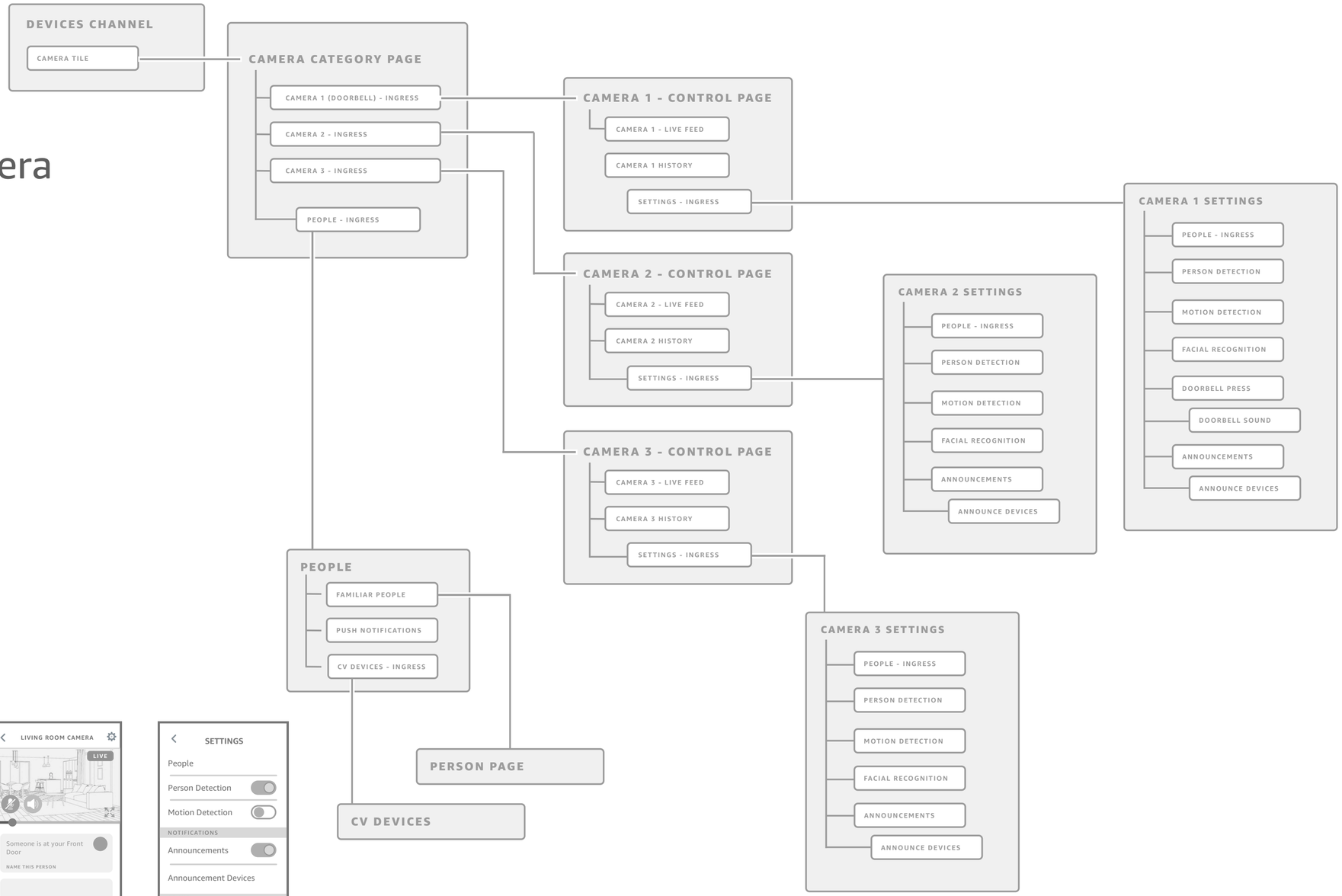


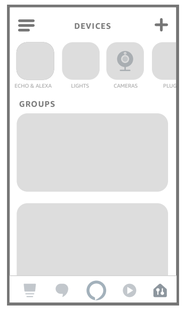


OPTION 3

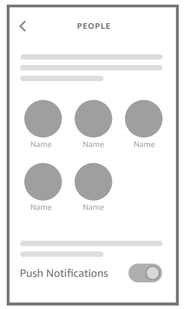
IA - Independent Ecology

Separate history and announcement on each camera

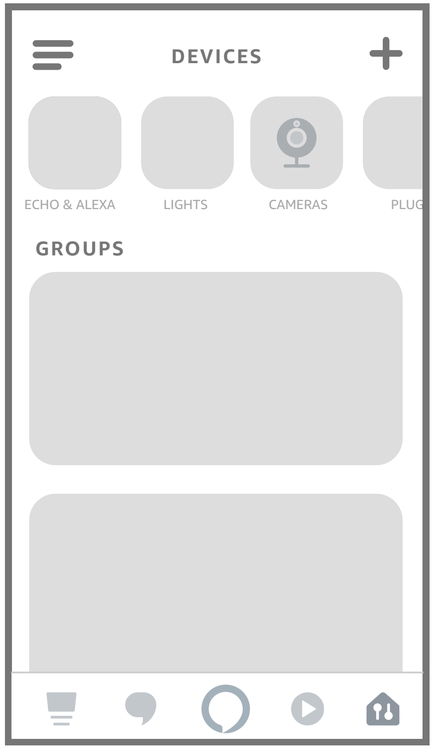


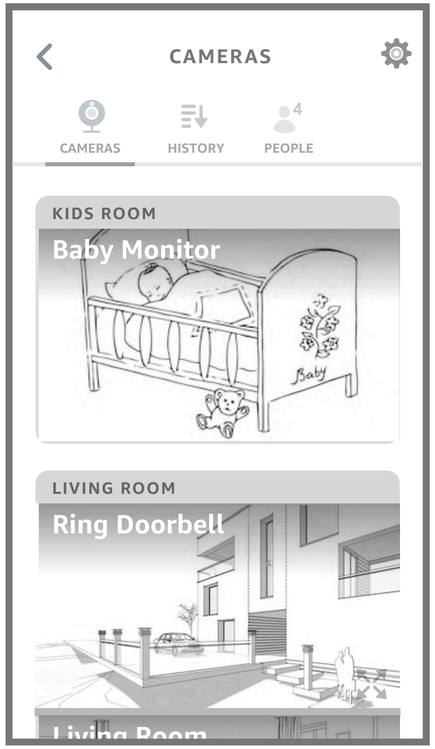


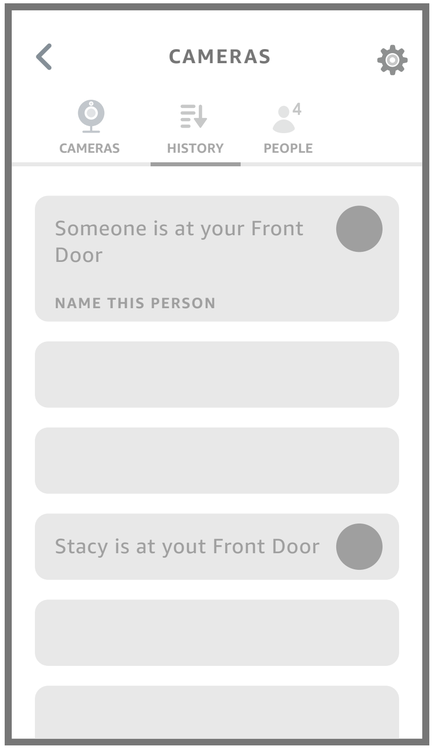


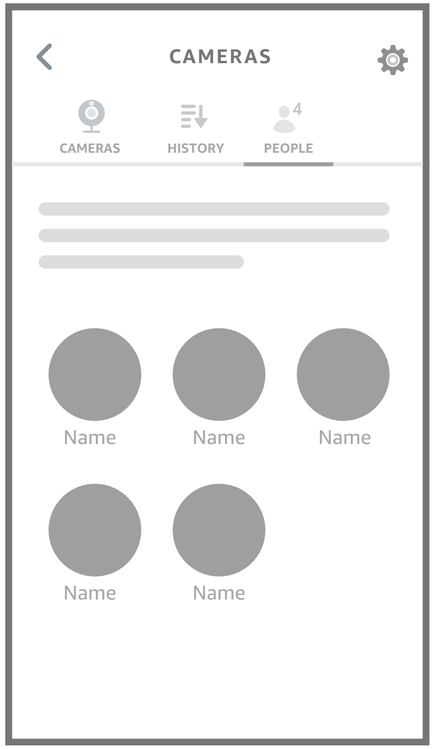


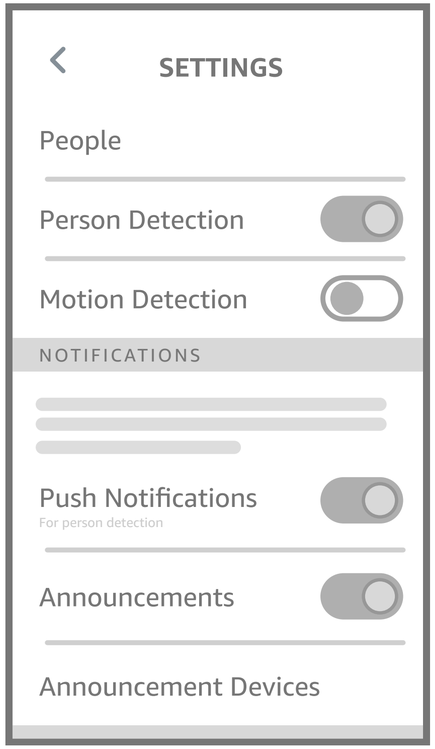
Camera devices dashboard with centralized history, notifications & announcements





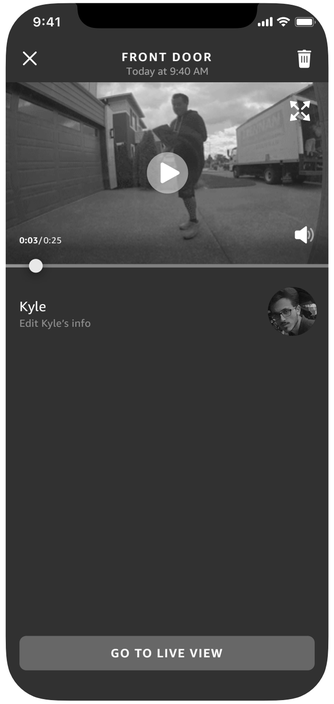


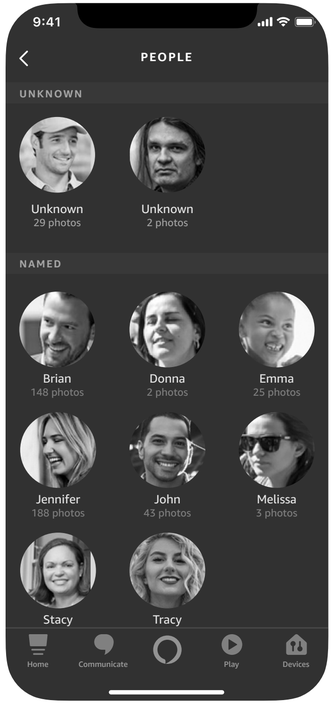


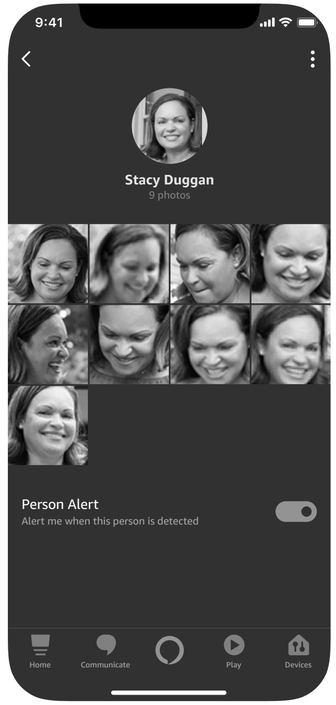


CV/CAMERA USABILITY STUDY









Introductions/small talk about what they do, how they use Alexa, do they use any security products to monitor their home today?

1. Setup
    1. Validate mental model
        1. Let's image you opened your Alexa app, and went to the devices icon. Talk me through what the app is communicating to you, and what you would do from here.
            1. (CV card is discovered): What would you expect to happen if you clicked on that card?
                1. Let's assume that you wanted to move forward with setting this up so that you could determine when your cameras (whatever is in the prototype) detects when someone is at your door. Please find a way to do this.
            2. (Post setup): Talk me through what you just did in the system.
            3. With this feature on, what do you expect will happen the next time someone comes to your house?
2. Image tagging
    1. Worst case scenario path to validate customers know what to do- (after notification is obtained): What is the notification communicating to you? Let's imagine that you recognize this person, and want to the Alexa to know that this is Kyle as they frequently come to your house. How would you do this? (after tagging) What would you expect to happen the next time Kyle comes to your home?

3. (start from Devices channels) View events - Imagine that you got a few notifications from Alexa today regarding people coming to your house; however, you did not get a chance to look at them. See if you can find information that would tell you who and when showed up at your house.
    1. Talk through what they see and expectations
        1. Walk me through where you would go and what you would do get more details from an event- If you wanted to get more details on _____(a specific event in the prototype) how would you do that?

4. Image tagging: If you wanted to see pictures of who has come to your house, how would you do this?
    0. (Once in people)- what is this page communicating to you? Imagine that you notice a picture of Stanely; however, you have not told Alexa who this is. How you do this?

5. Photo removal – Imagine recently tagged Stacy and you want to see what pictures Alexa has captured for her. How would you locate this information?
    1. Validate mental model – What is your impression of the information that you are seeing? (prompt to picture that is not of x if not mentioned)- That picture in the top left hand corner does not look like Stacy. What would you do from here to ensure that Alexa does not recognize Stacy with that picture?

USABILITY STUDY





Trends

- Value proposition
  - Goal isn't clear
    - ↳ inside/outside?
      - ↳ help w/ privacy concerns
  - Customer expectations on steps to setup
- CTA isn't clear ||
  - ↳ mental model
    - ↳ needs to identify which cameras
      - ↳ "choose cameras"
      - "setup"

Promo card

New features.
Card blended into the channel background

Wrong error message
change/delete

- Privacy
  - more control over notifications (eg. I don't need to know when my girlfriend is home)
- Education
  1. What happens after I've named/identified someone in the system.
     - CTA - needs to be bigger
  2. Photos
     - Where did the photos come from/who tagged them
     - Change photo to preferred photo vs camera photo
     - Include value - history of how often this person was detected
- Camera selection
  - Clarity on which cameras are supported & which are not

Ingress to see history

- home channel
- camera tile in devices channel
- left nav = all history (Parent)
  - ↳ activity

Guard feature ||

customers' mental models seem like this is a security feature that would work w/ Guard

Notifications

- Need customization
  - per room
  - per person
- what's notification when unfamiliar persons are detected and not my wife
- Ability notific... but not
  - Ing...

Value cont'd

- Messaging is selling the wrong expectations 4/4
  - ↳ familiar person detection
    - ↳ value is in knowing unfamiliar faces
    - ↳ security feature, not name your friends
      - ↳ privacy becomes a concern "creepy"
        - ↳ why does Amazon want to know your friends

Customers aren't going to think this feature is smart
- ↳ why do I need to tag?

Camera tile

Quick access to cameras from the devices channel



CAMERA TILE ON DEVICES CHANNEL

Live View

Access live camera footage on the app




9:41
LIVING ROOM
LIVE


LIVE
Living Room

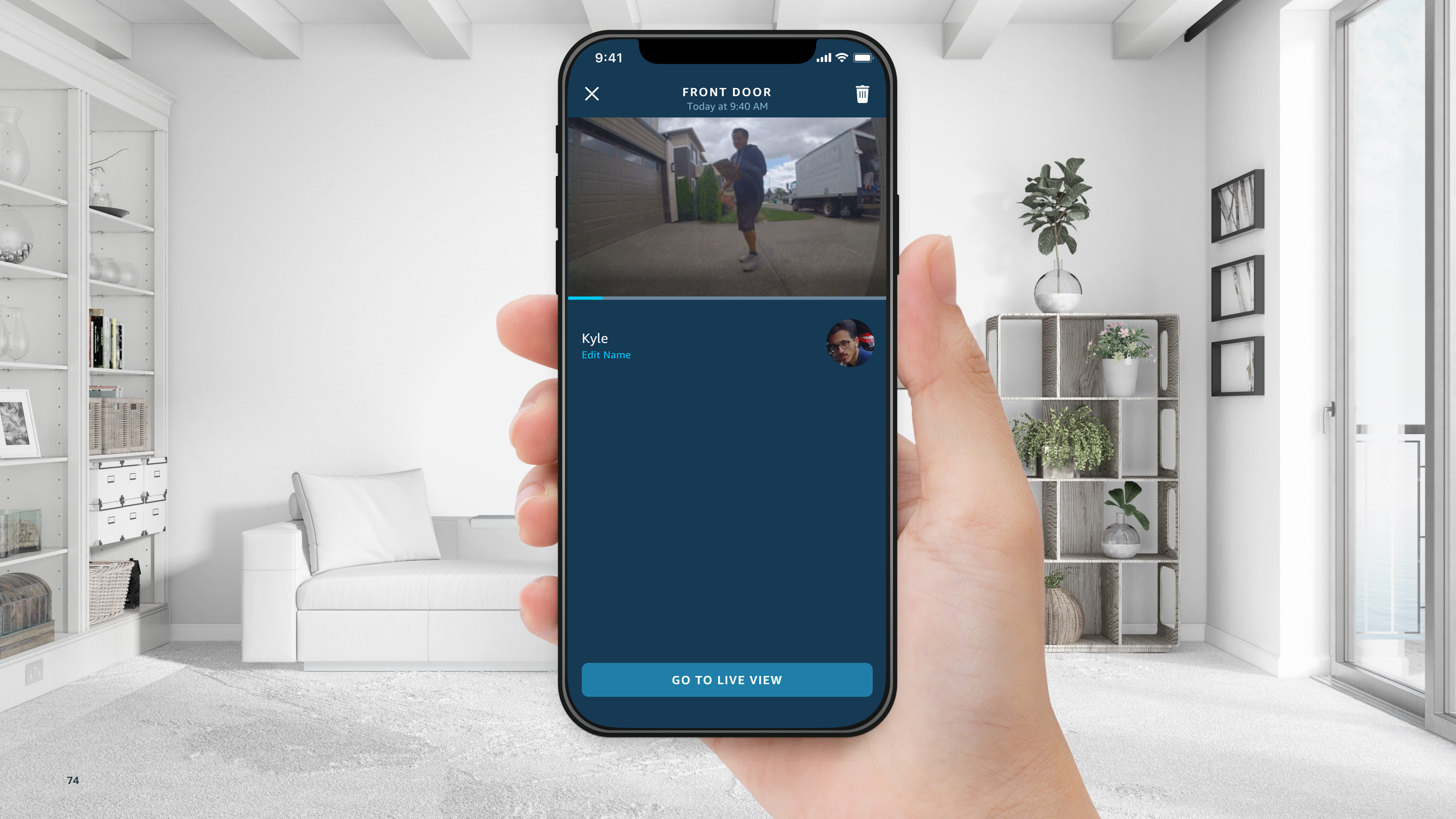

9:41
LIVING ROOM
LIVE

Facial detection & recognition




9:41
FRONT DOOR
Today at 9:40 AM
Unfamiliar Person
Name this person
GO TO LIVE VIEW


9:41
FRONT DOOR
Today at 9:40 AM
Unfamiliar Person
Name this Person
Kyle
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
Done


9:41
FRONT DOOR
Today at 9:40 AM
Kyle
Edit Name
GO TO LIVE VIEW


9:41
CAMERAS
Cameras
Events
People
Today
9:41 AM
Someone is at your Back Door
NAME THIS PERSON
9:41 AM
Kyle is at your Front Door
This is not Kyle
7:09 AM
Motion detected on Yard Camera
Yesterday
9:00 AM
Stacy is at your Front Door

People profile




9:41
Stacy
Notifications & Announcements
Tell me when this person is detected
PHOTOS


9:41
Wednesday, September 12
AMAZON ALEXA
now
Stacy is at your Front Door

Camera CV



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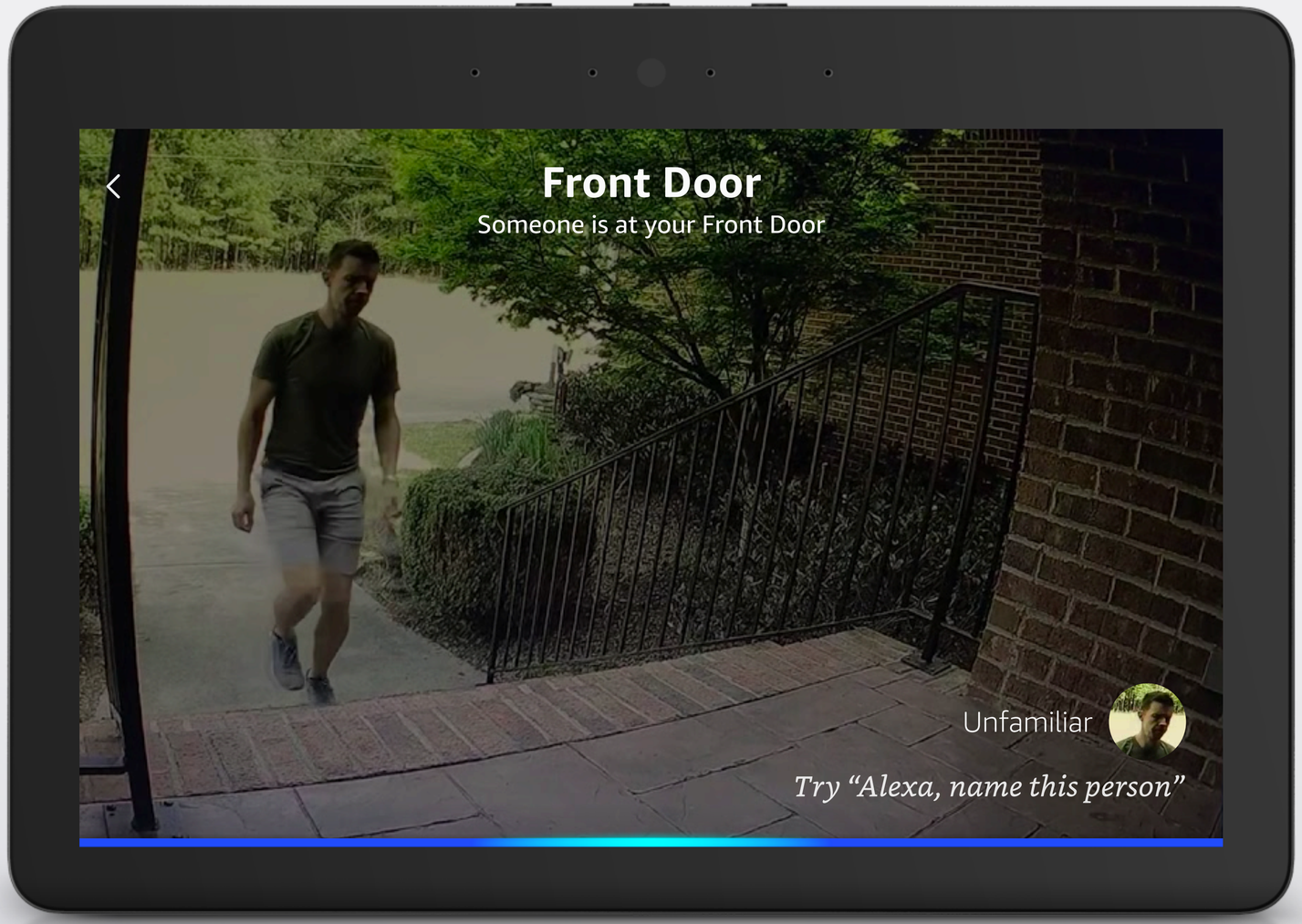
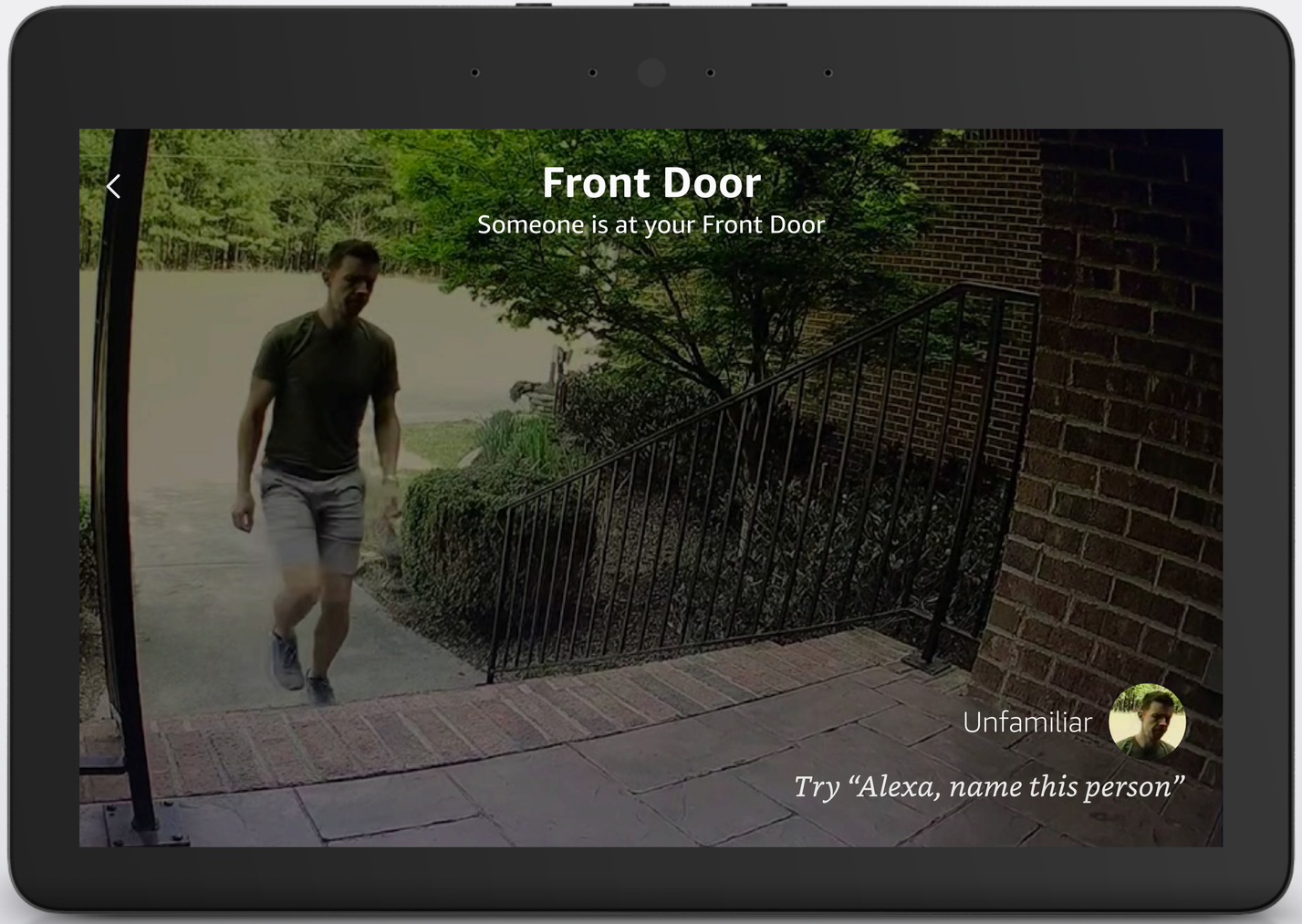
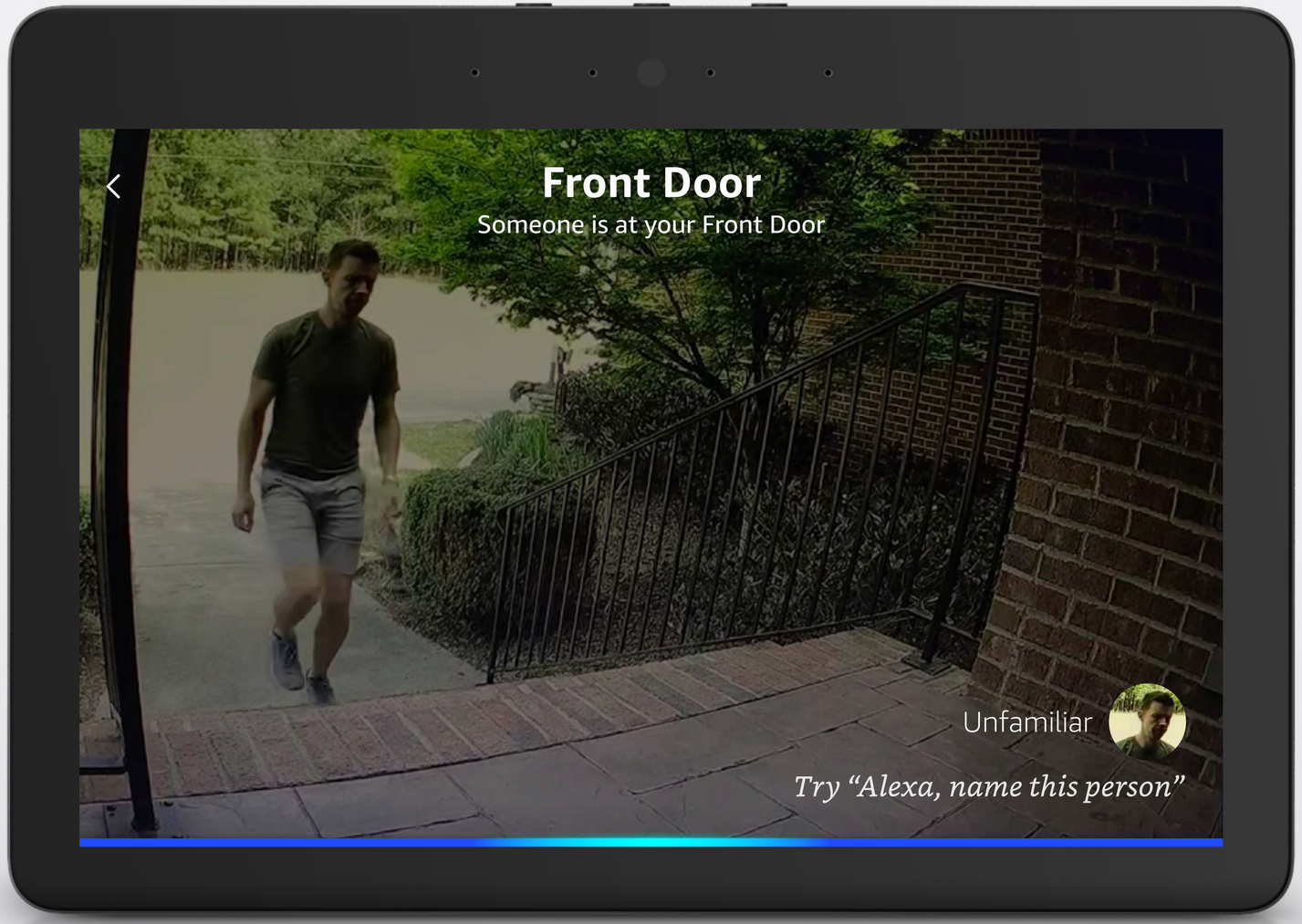
Camera CV


Front Door
Someone is at your Front Door
Unfamiliar
Try “Alexa, name this person”

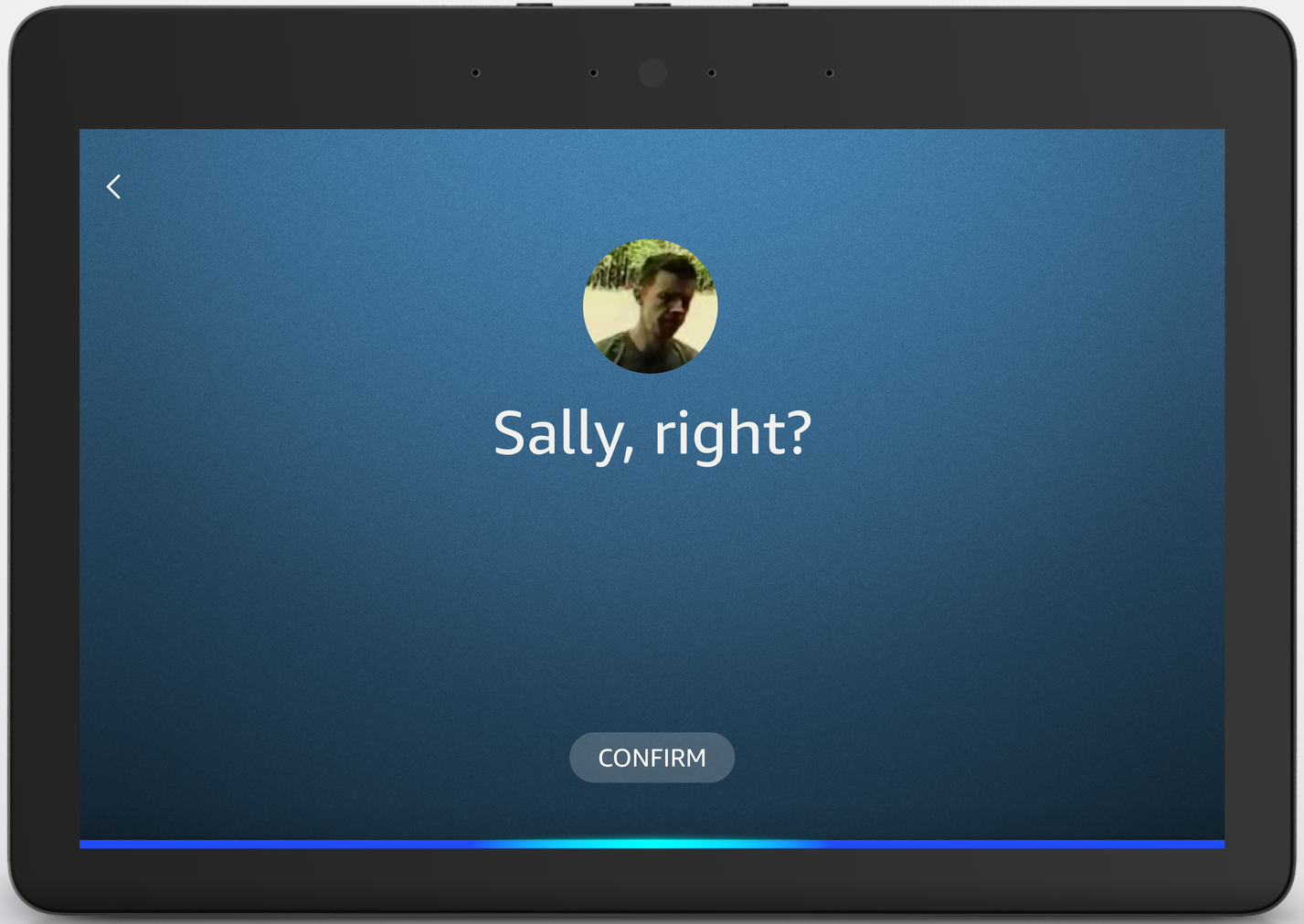
Camera CV


Front Door
Someone is at your Front Door
Unfamiliar
Try “Alexa, name this person”

Camera CV


Front Door
Someone is at your Front Door
Unfamiliar
Try “Alexa, name this person”

Camera CV



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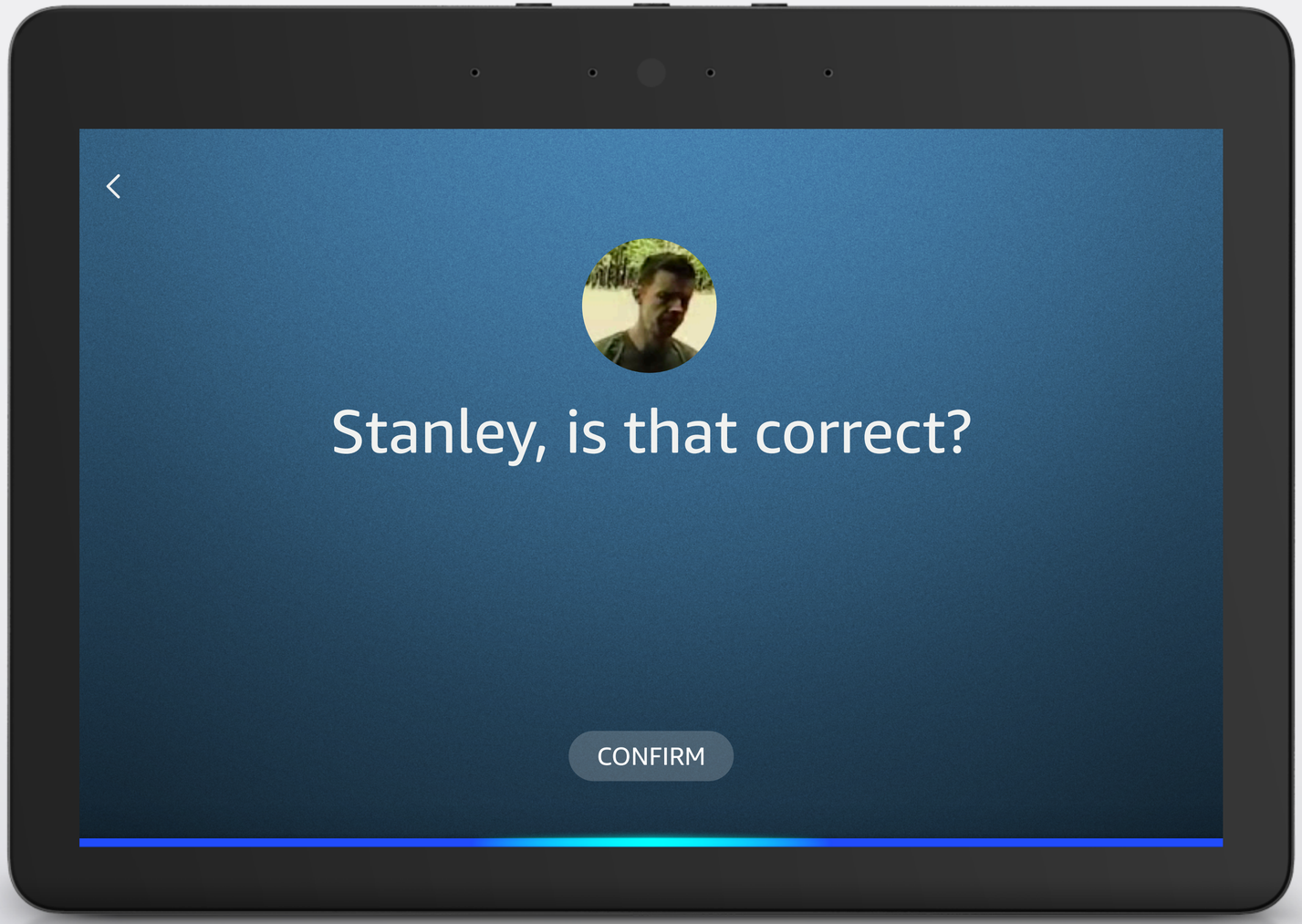
Camera CV



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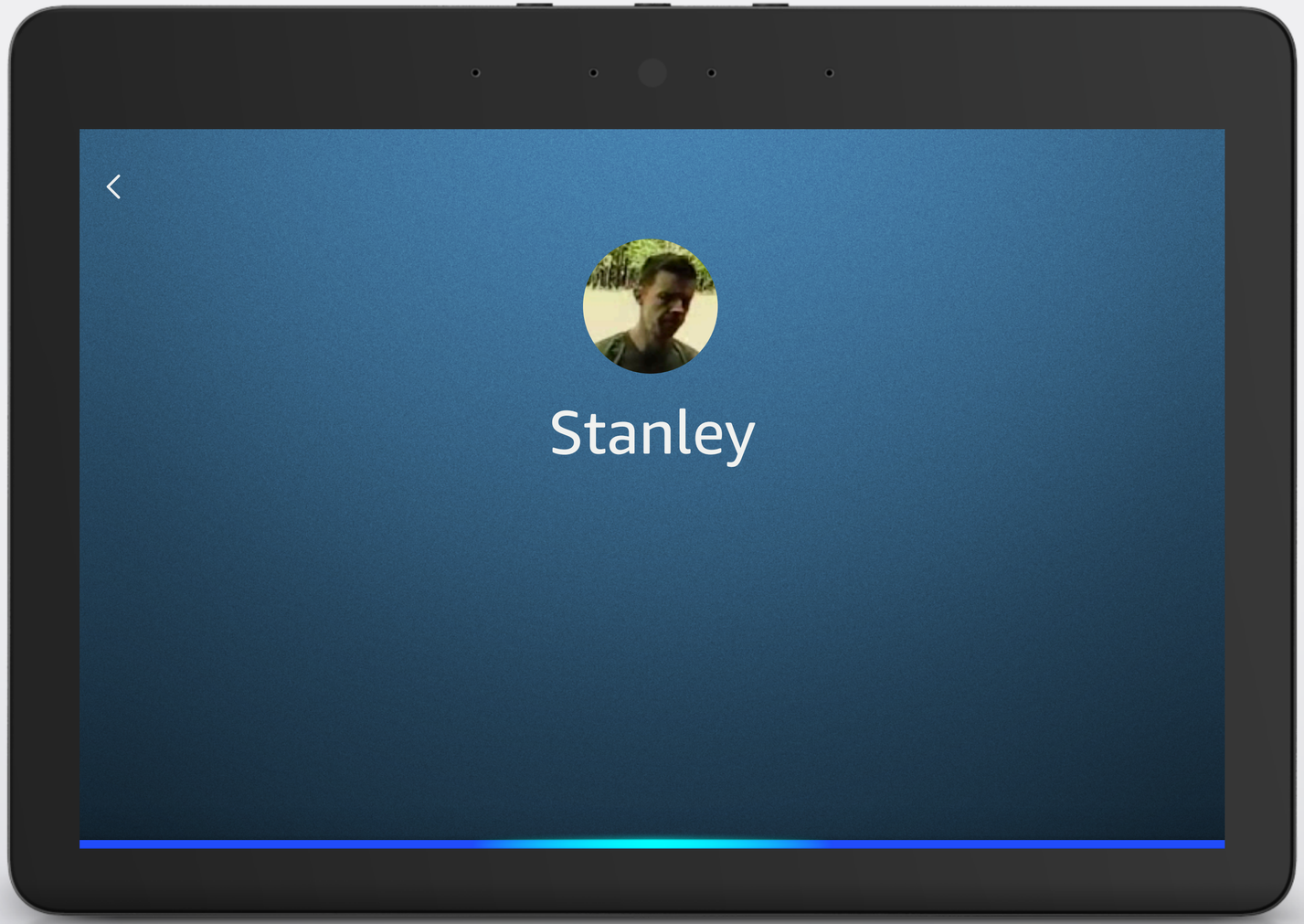

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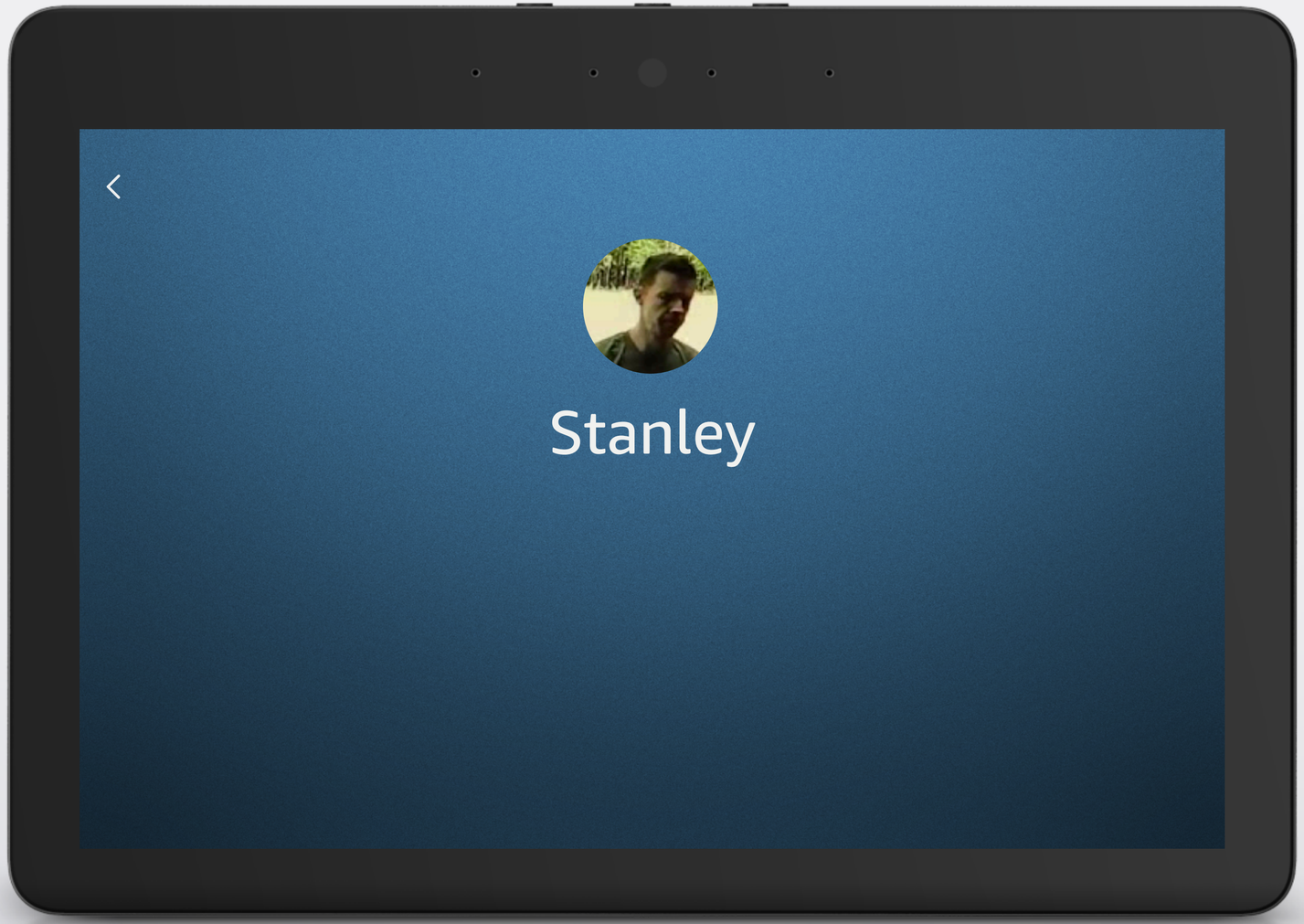
Camera CV



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Camera CV



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High engagement with our beta customers

~ 33K beta customers
~ 19K daily active users (DAU)
~ 24K monthly active users (MAU)

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What we've learned

- Customers lose trust when we misidentify a person. The accuracy now is about (65%).

What we are working on

- Improving the accuracy of our facial detection.
- Avoiding pet detection.
- Identifying a delivery person vs other people

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Thank you