Automating macOS and iOS

Adam Tow

MacAdmins - October 16, 2019

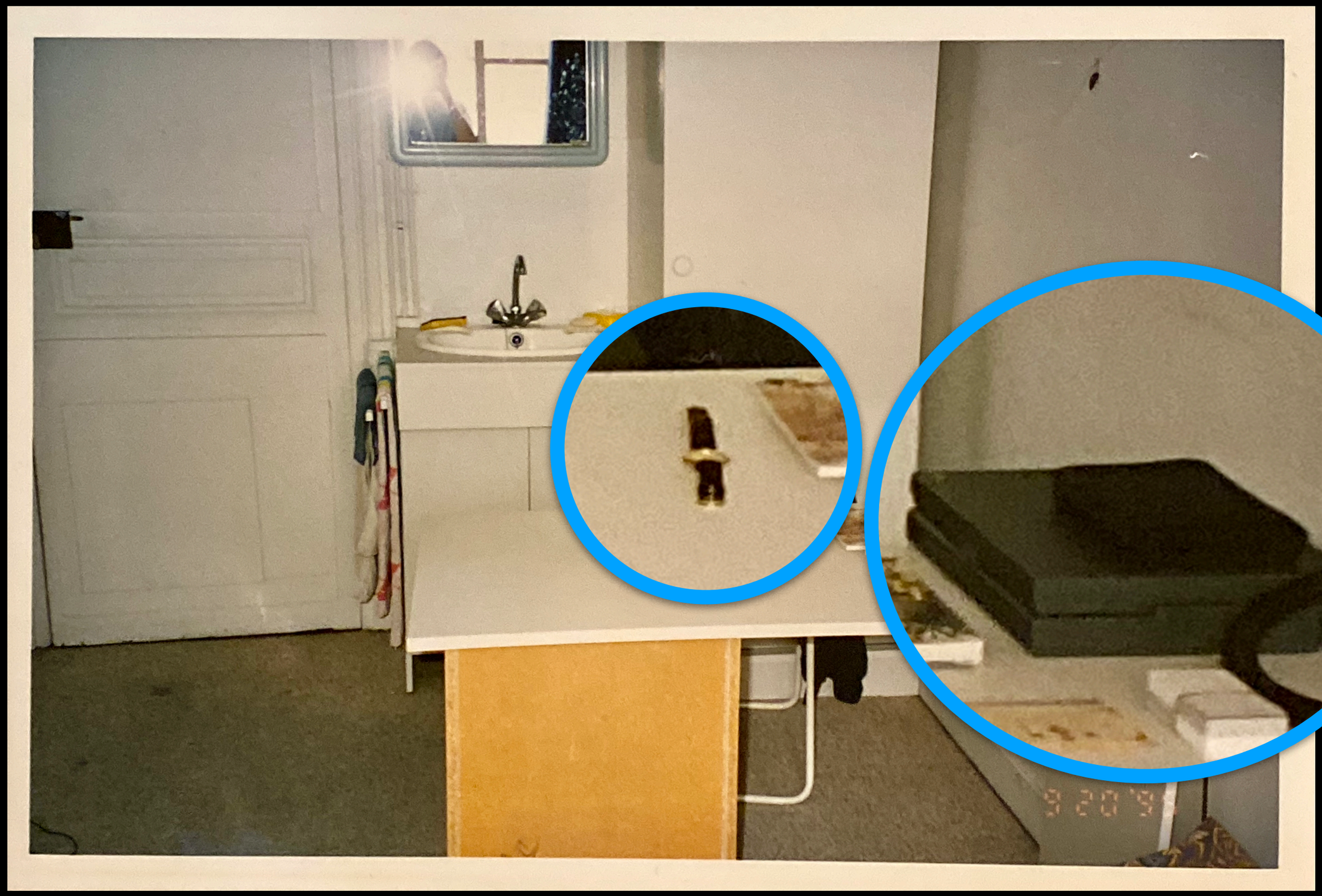
About Adam Tow

- Using Apple products since the Apple][.
- First Mac was an SE/30.
- First laptop was the PowerBook 180.

Newton and Mobile Computing

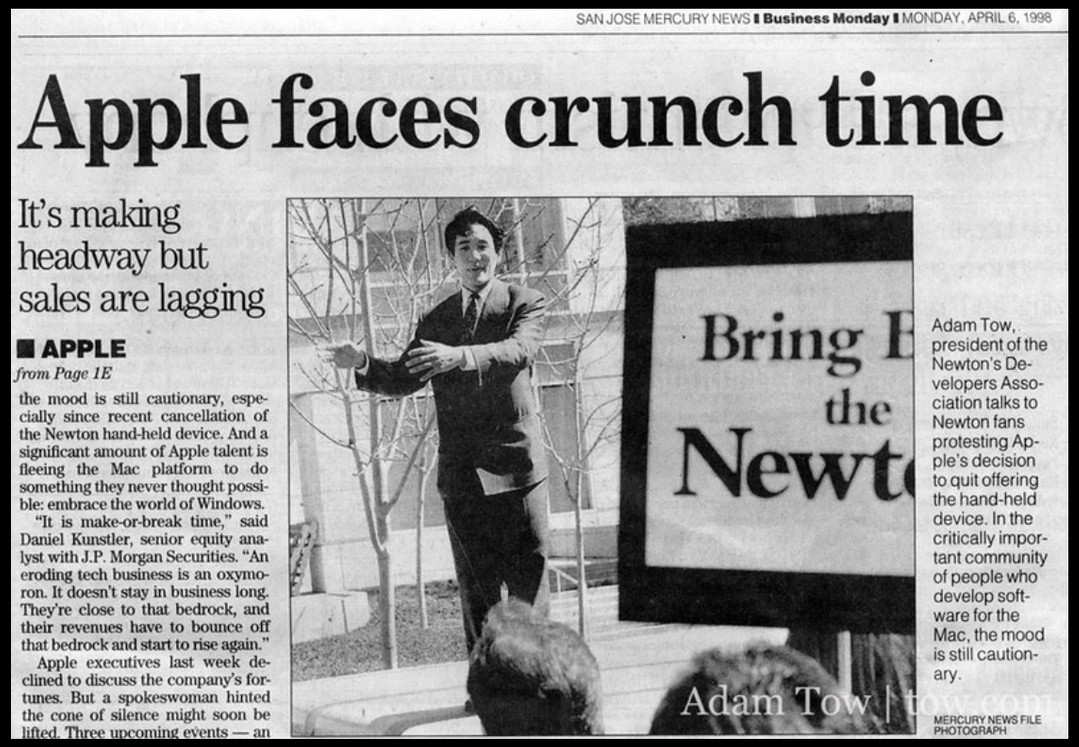
- Got interested in mobile computing with the Newton MessagePad.
- Saw it as the future of computing, in your hand and pocket.
- “Everyone is going to have these one day!”

24 Years Ago



Newton Protest / Feb 1998

- Newton was cancelled by Steve Jobs in February, 1998.
- Led the Newton Protest at Apple Infinite Loop campus.
- Tim Cook’s first day at Apple!



SAN JOSE MERCURY NEWS ▮ **Business Monday** ▮ MONDAY, APRIL 6, 1998

Apple faces crunch time

It’s making headway but sales are lagging

APPLE

from Page 1E

the mood is still cautionary, especially since recent cancellation of the Newton hand-held device. And a significant amount of Apple talent is fleeing the Mac platform to do something they never thought possible: embrace the world of Windows.

“It is make-or-break time,” said Daniel Kunstler, senior equity analyst with J.P. Morgan Securities. “An eroding tech business is an oxymoron. It doesn’t stay in business long. They’re close to that bedrock, and their revenues have to bounce off that bedrock and start to rise again.”

Apple executives last week declined to discuss the company’s fortunes. But a spokeswoman hinted the cone of silence might soon be lifted. Three upcoming events — an

Adam Tow, president of the Newton’s Developers Association talks to Newton fans protesting Apple’s decision to quit offering the hand-held device. In the critically important community of people who develop software for the Mac, the mood is still cautionary.

MERCURY NEWS FILE PHOTOGRAPH

AllThingsD and D5

- Built the AllThingsD.com and recode.net websites for Walt Mossberg and Kara Swisher

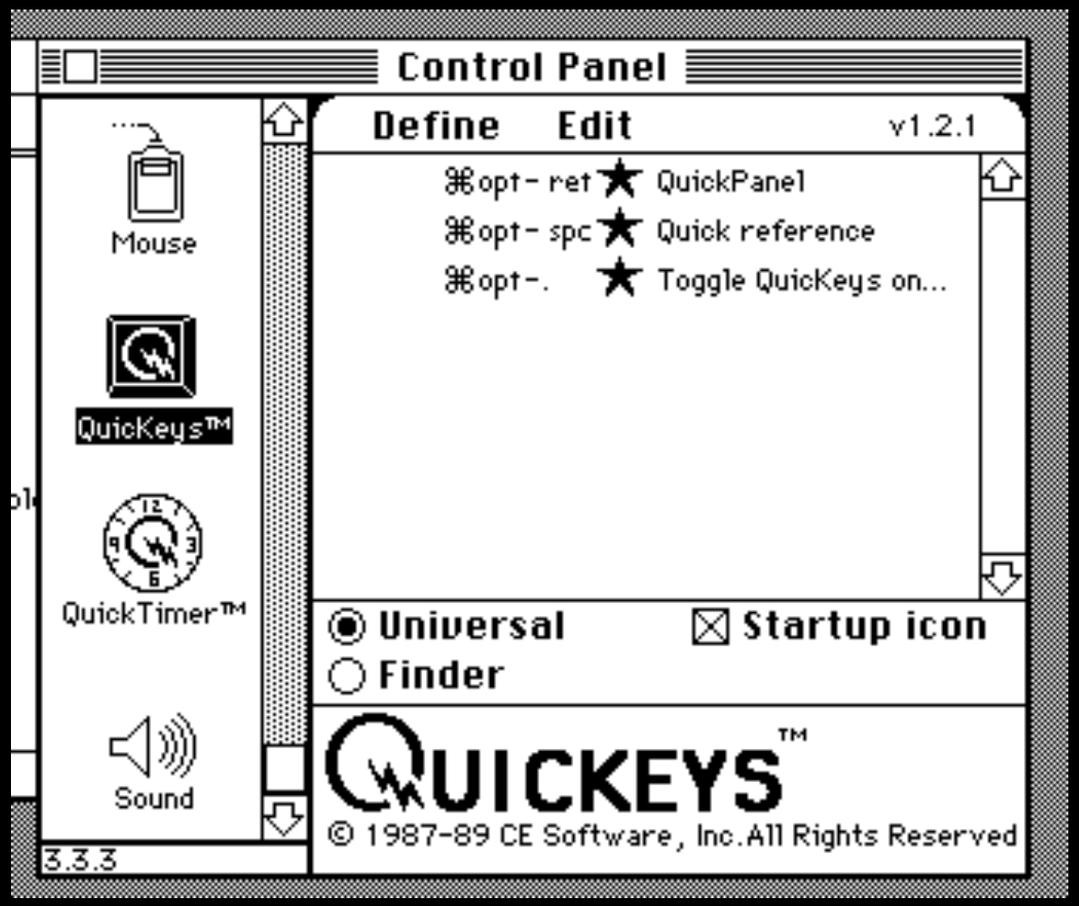
- Was present at the historic Steve Jobs and Bill Gates interview at **D5** in 2007.

- Currently the Tech Lead for the conferences team at Vox Media.

Automation on the Macintosh

Quickeys

- Made by Donald Brown and CE Software.
- Control Panel for System 6.
- Created macros that simulated key presses and mouse operations.



“…here I am, at like 10:14 typing away on my Mac running SYSTEM 7.0!!!!!! I love it! It is the most awesome piece of software I have seen yet! Just absolutely awesome. However, there are some things that are incompatible with the new current system software, such as Norton Utilities, SUM II, **Quickeys**, and a couple more. That really sucks since I use all of those applications. **Quickeys is the one that I will miss the most because I use it just so much of the time**.”

–Adam Tow, May 18, 1991

“Life without Quickeys is turning bad. Oh well… I can learn to cope.”

–Adam Tow, June 20, 1996

Modern Mac Automation

AppleScript

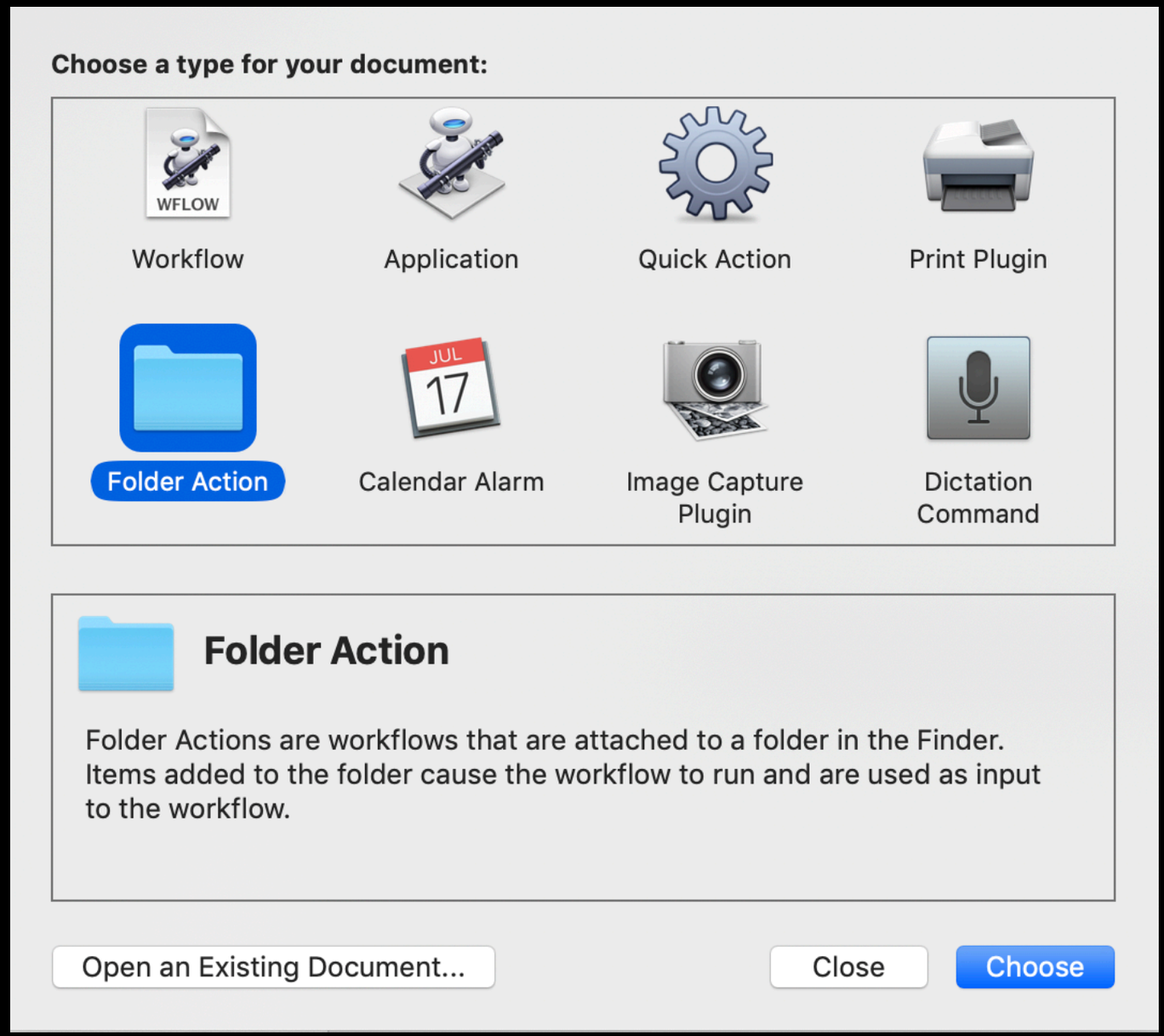
- Introduced in System 7 back in 1993.
- English-like language.
- do shell script
  - Call command-line scripts.
- osascript
  - Call AppleScript scripts.

Automator

- Introduced in Mac OS X Tiger (10.4)
- GUI for automating tasks without knowledge or programming or scripting languages.
- Output of previous action becomes input of the next action.

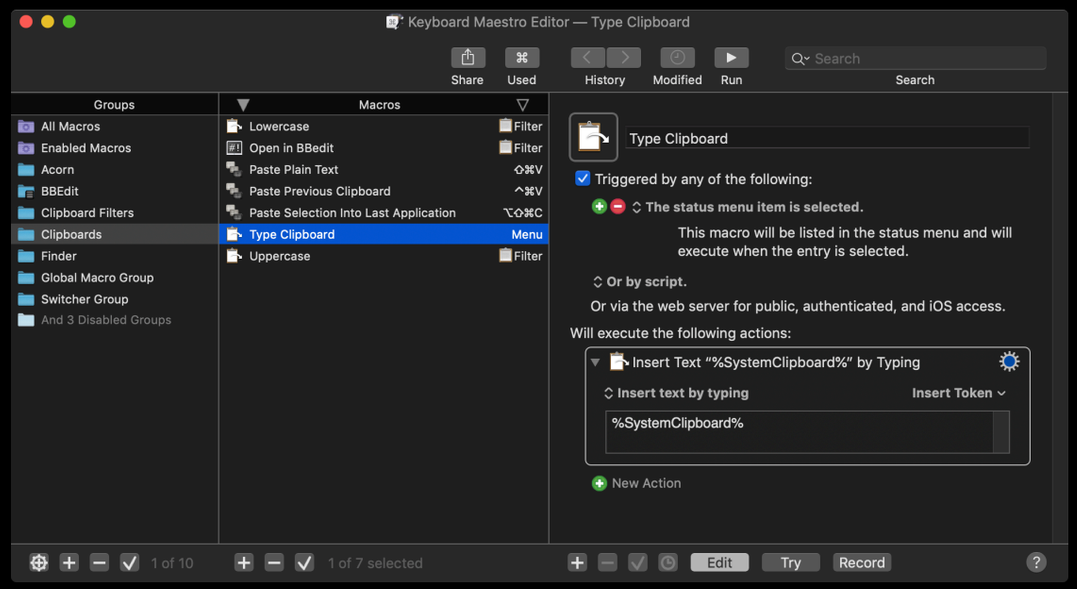
Automator

- Workflow
- Application
- Quick Action
- Print Plugin
- Folder Actions
- Calendar Alarm
- Image Capture Plugin
- Dictation Command



Keyboard Maestro

- “Automate applications or web sites, text or images, simple or complex, on command or scheduled. You can automate virtually anything.”
- Version 9.0 was just released.
- $36
- https://www.keyboardmaestro.com/



Triggers

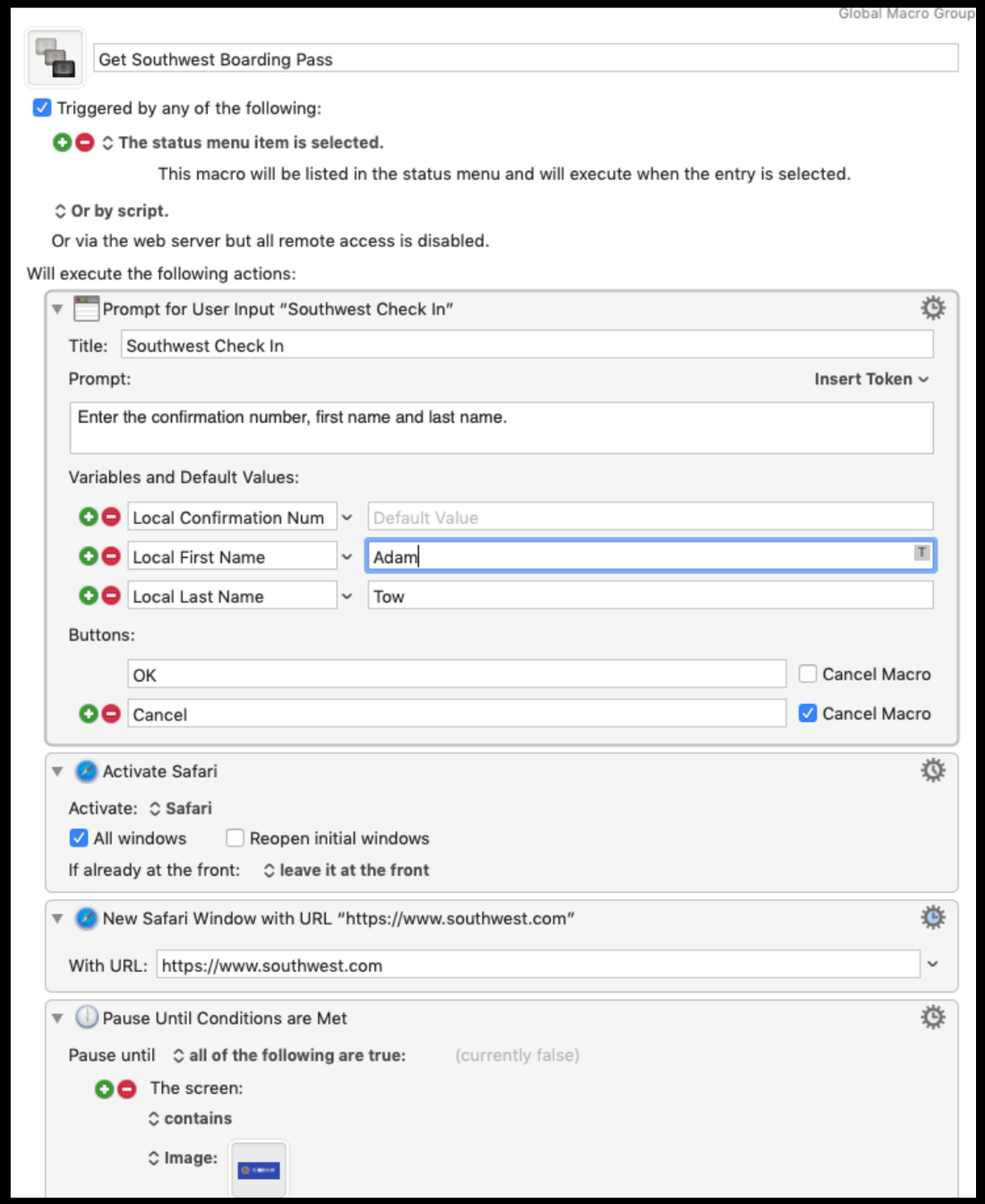
- Hot keys
- Applications
- Input devices
- Clipboard
- Cron
- Display layout
- Windows
- Folders
- Gestures
- Scripts
- Sleep / Login / Idle
- Volumes
- Web Triggers
- Remote
- Wireless Network

Actions

- Application control
- Clipboard
- Control flow
- Execute scripts
- File
- Browser control
- Image
- Interface control
- iTunes control
- Notifications
- System control
- Text
- Variables
- Web

Example Keyboard Maestro Macros

- Get Southwest Boarding Pass.



Hazel

- “Automated Organization for your Mac”
- $32-49
- https://www.noodlesoft.com
- **Hold on if you are running macOS Catalina**

Triggers

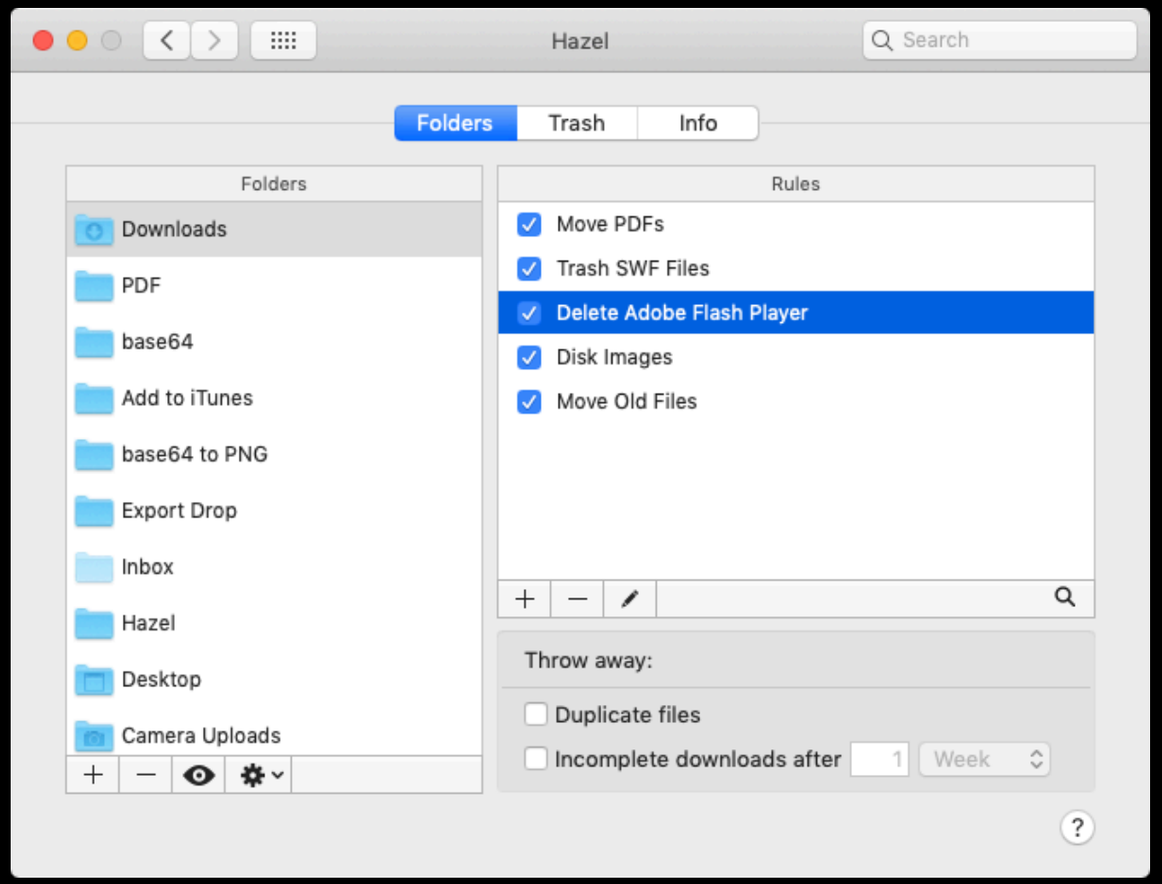
- Name / Extension / Full Name
- Date Added / Created / Modified / Opened / Last Matched
- Current Time
- Kind / Size
- Tags / Color Label / Comment
- Contents
- Source URL / Address
- Subfolder Depth / Sub-file/folder Count
- Any File
- Passes AppleScript / JavaScript / shell script
- Other

Actions

- Move / Copy / Rename / Sort into subfolder
- Sync / Upload
- Add / Remove tags, color label / comment
- Archive / Unarchive
- Open / Show in Finder / Make alias
- Import into iTunes / Photos
- Run AppleScript / JavaScript / Automator workflow / shell script
- Run runs on folder contents / Continue matching rules
- Display notification
- Ignore

Example Hazel Rules

- Organize Downloads folder.
- Inspect and organize PDFs.
- Run shell scripts on files.
- Delete malware installers.



Hazel

Search

Downloads

Name: Delete Adobe Flash Player

If any of the following conditions are met

Preview

Name	contains	Adobe Flash Player
Name	contains	install_flash_player_osx

Do the following to the matched file or folder:

Move to folder: Trash Options

Cancel OK

Hazel

Desktop

Camera Uploads

Throw away:

Duplicate files

Incomplete downloads after 1 Week

Mac Automation

Examples

1. Open Photo Mechanic

- Insert a memory card.
- Launches the Photo Mechanic application.
- Presses Command-G to open the Ingest dialog.

2. Pay Bills

- Streamline the task of paying bills every month.
- Opens Reminders, 1Password, Finder folders.
- Opens Safari and Chrome to all sites.
- Resizes and positions all windows on monitors.
- Hazel script renames and moves statements to correct folders after downloading by inspecting filenames or contents of PDF files.

3. Southwest Check-In

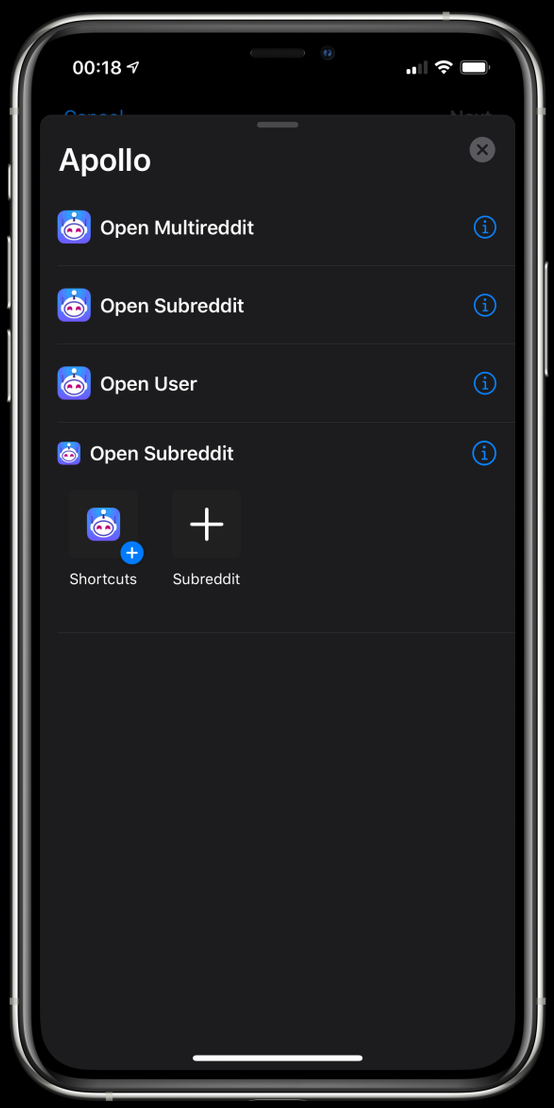
- Asks for a confirmation code, first name, and last name.
- Open Safari to the Southwest website.
- Simulates mouse clicks and keyboard input to check me into my flight.
- **Get that A boarding pass!**

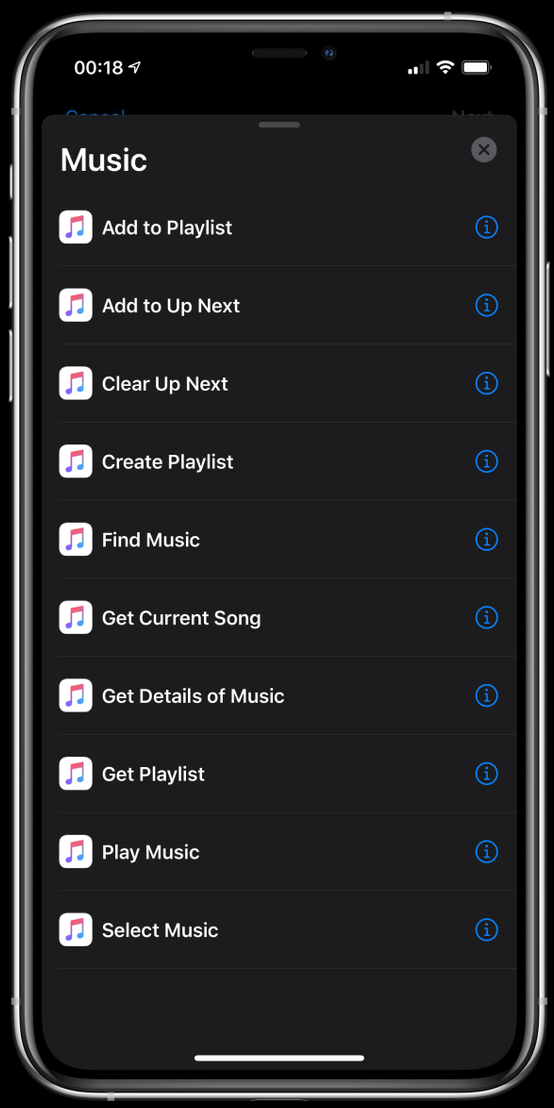
iOS Automation

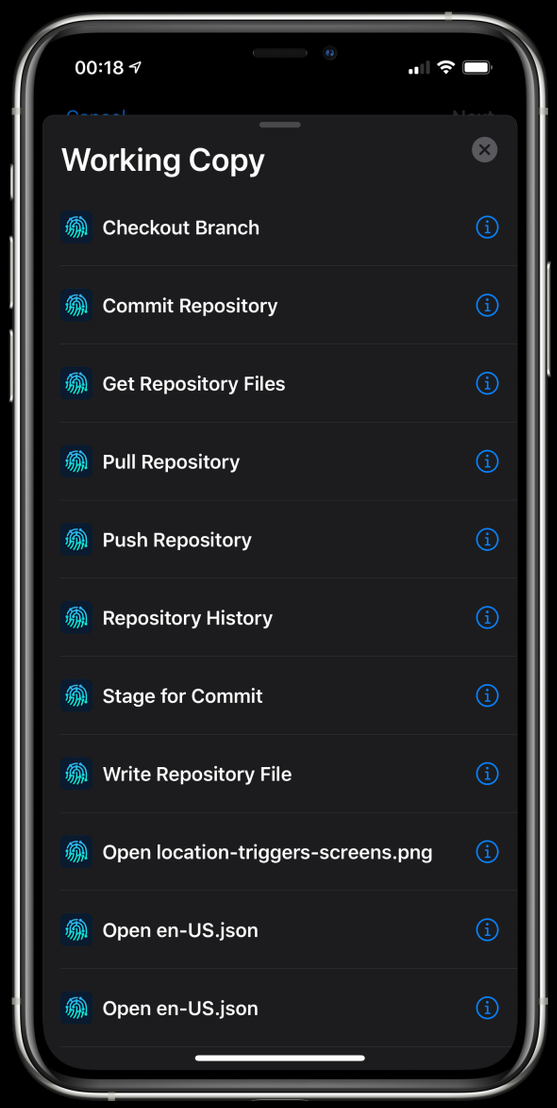
Shortcuts

- Originally developed as Workflow.
- Purchased by Apple in 2017.
- Rebranded as Shortcuts in iOS 12.
- Built-into iOS 13.
    - Installed on all new devices.

Built-in Actions and Third-Party Support in iOS 13

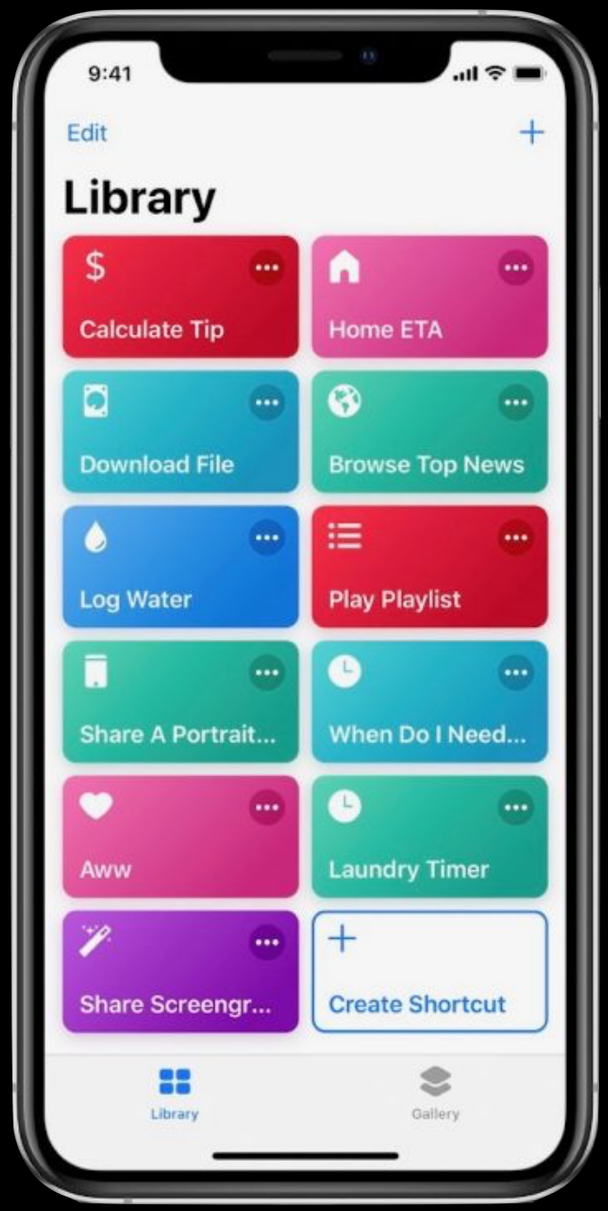




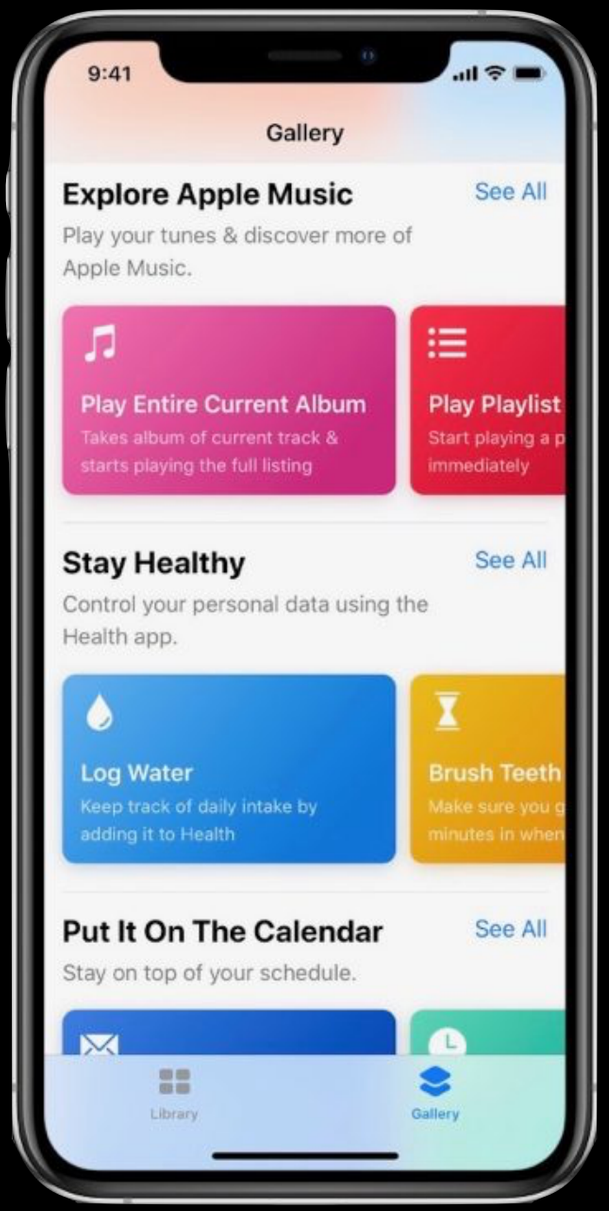


Shortcuts

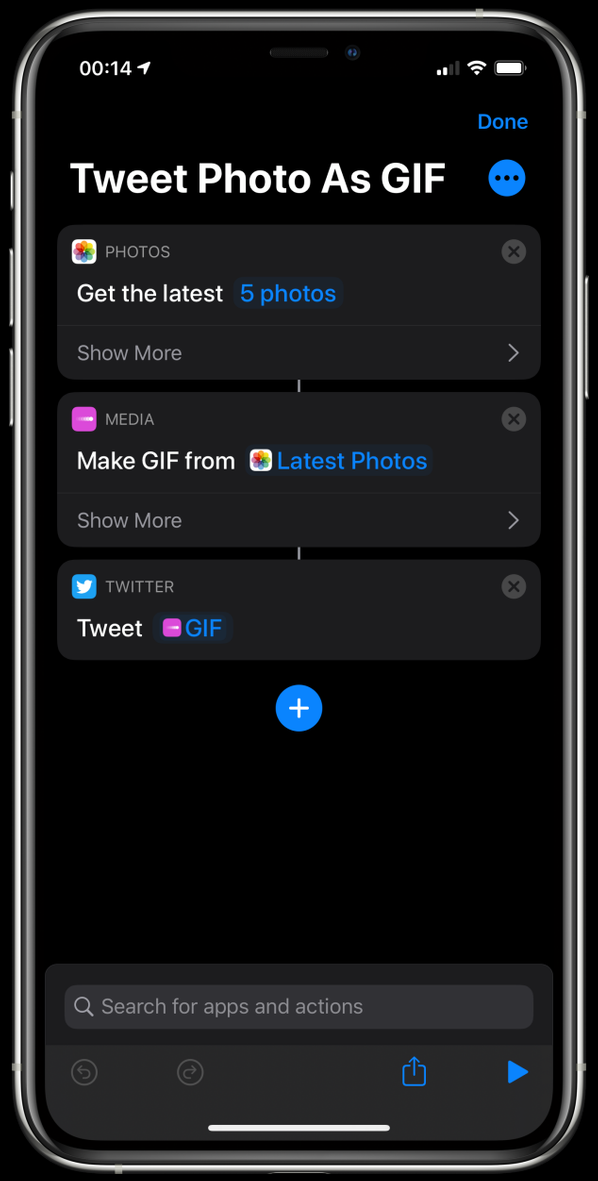
- In Shortcuts for iOS 12, the output of previous action became the input of the next action.
    - Like in Automator.
- In Shortcuts for iOS 13, actions have parameters built-in.
    - The previous action doesn’t always become the next action.
    - Moreover, actions are laid out in a natural language manner.


9:41
Edit
Library
Calculate Tip
Home ETA
Download File
Browse Top News
Log Water
Play Playlist
Share A Portrait...
When Do I Need...
Aww
Laundry Timer
Share Screengr...
Create Shortcut
Library
Gallery

9:41
Tweet Photos As GIF
Done
Get Latest Photos
5 Photos
Include Screenshots
Make GIF
Seconds Per Photo
0.2
Loop Forever
Auto Size
Tweet
Search
Cancel


9:41
Gallery
Explore Apple Music
See All
Play your tunes & discover more of Apple Music.
Play Entire Current Album
Takes album of current track & starts playing the full listing
Play Playlist
Stay Healthy
See All
Control your personal data using the Health app.
Log Water
Keep track of daily intake by adding it to Health
Brush Teeth
Put It On The Calendar
See All
Stay on top of your schedule.
Library
Gallery

00:14
Edit
My Shortcuts
Tweet
Cancel
Tweet Photo As GIF
3 actions
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
search

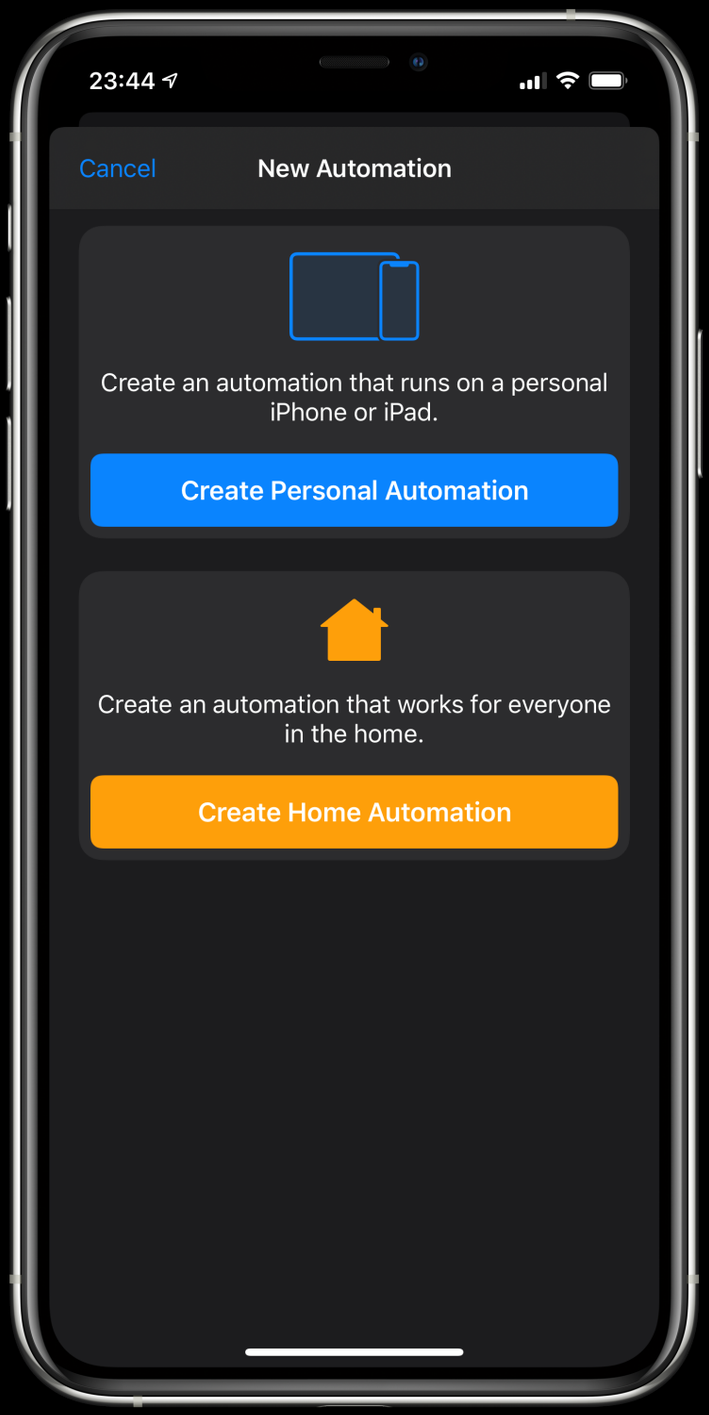

00:14
Done
Tweet Photo As GIF
PHOTOS
Get the latest 5 photos
Show More
MEDIA
Make GIF from Latest Photos
Show More
TWITTER
Tweet GIF
Search for apps and actions

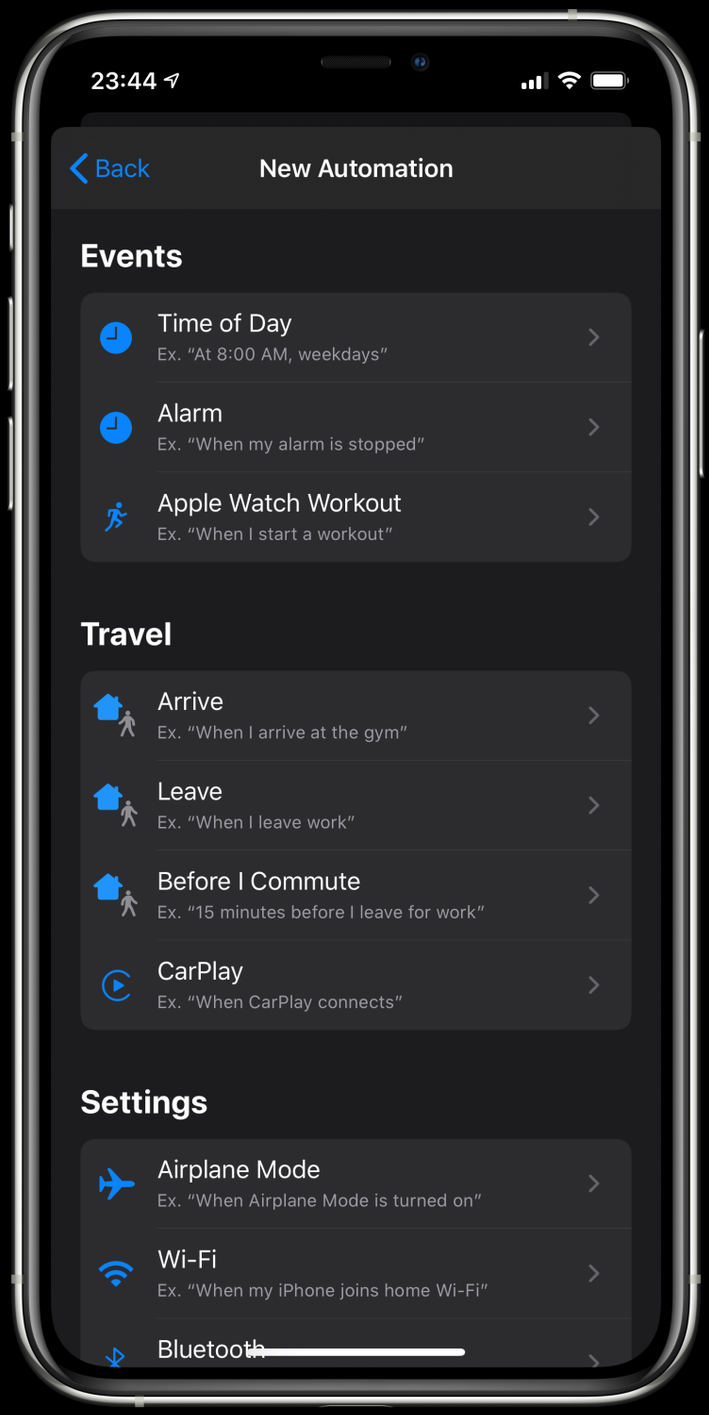
00:15
Gallery
Essentials
See All
Shortcuts everyone should have in their toolbox.
Set Audio Output
Switch the audio output to AirPlay, AirPods, or a Bluetooth device
Home ETA
Share how long it will to get home
Morning Routine
See All
Wake up with these shortcuts to start off your day.
When Do I Need To Leave By?
Tells you when to leave home so you're not late for work
Quick Shortcuts
See All
Less taps, more done with these fast shortcuts!
Open App on Apple TV
Opens a specific app on your Apple TV
Wake Apple TV
My Shortcuts
Automation
Gallery

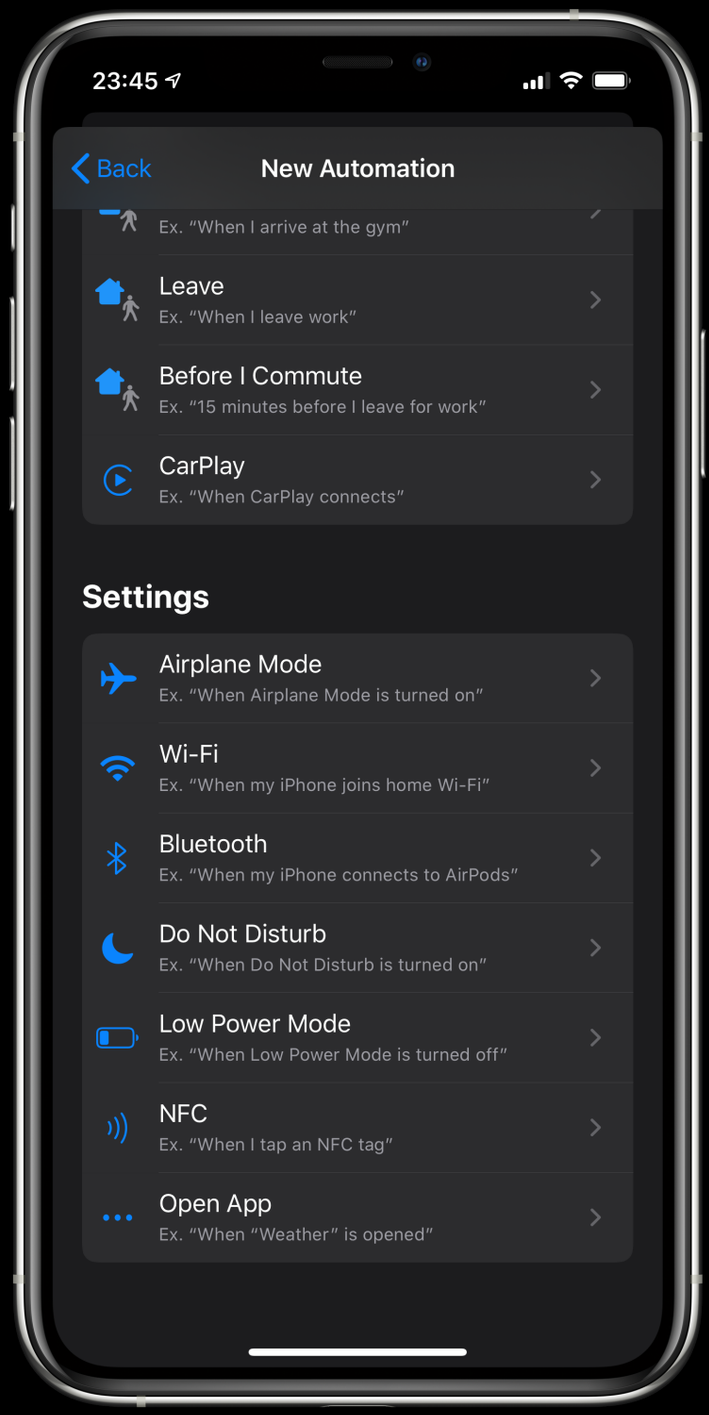
Shortcuts Demo

iOS 13 Personal Automations

- Trigger-based running of shortcuts
- Time
- When Wi-Fi is connected
- When connected to CarPlay
- When an app is opened
- Tap an NFC sticker
    - Requires iPhone Xs, Xs Max, XR, 11, 11 Pro, or 11 Pro Max


23:44
Cancel
New Automation
Create an automation that runs on a personal iPhone or iPad.
Create Personal Automation
Create an automation that works for everyone in the home.
Create Home Automation


23:44
Back
New Automation
Events
Time of Day
Ex. "At 8:00 AM, weekdays"
Alarm
Ex. "When my alarm is stopped"
Apple Watch Workout
Ex. "When I start a workout"
Travel
Arrive
Ex. "When I arrive at the gym"
Leave
Ex. "When I leave work"
Before I Commute
Ex. "15 minutes before I leave for work"
CarPlay
Ex. "When CarPlay connects"
Settings
Airplane Mode
Ex. "When Airplane Mode is turned on"
Wi-Fi
Ex. "When my iPhone joins home Wi-Fi"
Bluetooth


23:45
Back
New Automation
Ex. "When I arrive at the gym"
Leave
Ex. "When I leave work"
Before I Commute
Ex. "15 minutes before I leave for work"
CarPlay
Ex. "When CarPlay connects"
Settings
Airplane Mode
Ex. "When Airplane Mode is turned on"
Wi-Fi
Ex. "When my iPhone joins home Wi-Fi"
Bluetooth
Ex. "When my iPhone connects to AirPods"
Do Not Disturb
Ex. "When Do Not Disturb is turned on"
Low Power Mode
Ex. "When Low Power Mode is turned off"
NFC
Ex. "When I tap an NFC tag"
Open App
Ex. "When "Weather" is opened"

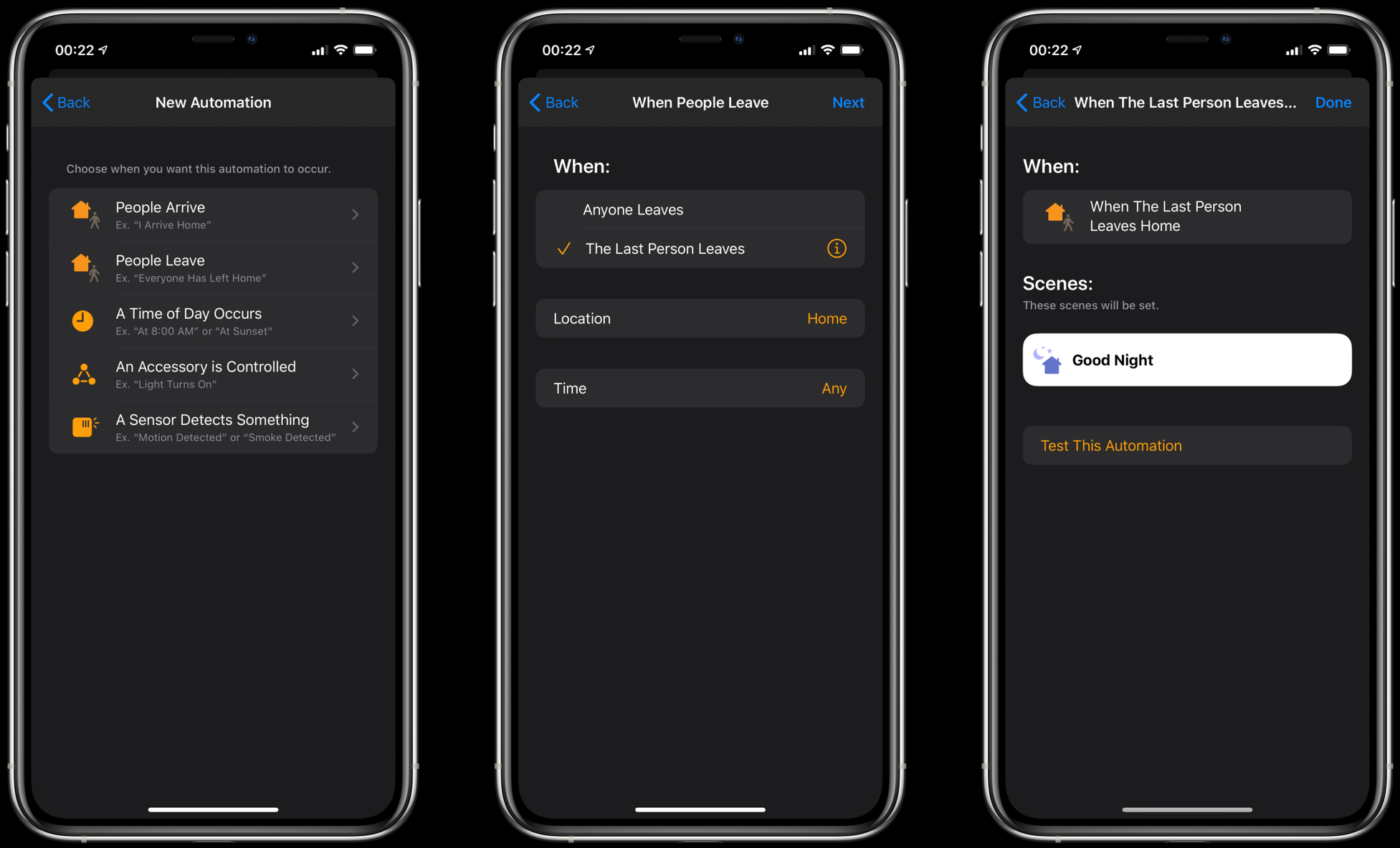
Personal Automations Limitations

- Many personal automation still require a tap to run.
  - Time-based
  - Location
  - Wi-Fi
- Some shortcut actions don’t run properly when device is locked.
- Can’t really use iOS as a mini-server.

iOS 13 Home Automations

- HomeKit status changes
  - Lights turn on, time of day, switches are toggled, etc.
- Limited set of actions available
  - Get Contents of URL
  - Run SSH Command

Will the Last Person to Leave Turn Off the Lights?



Voice Control

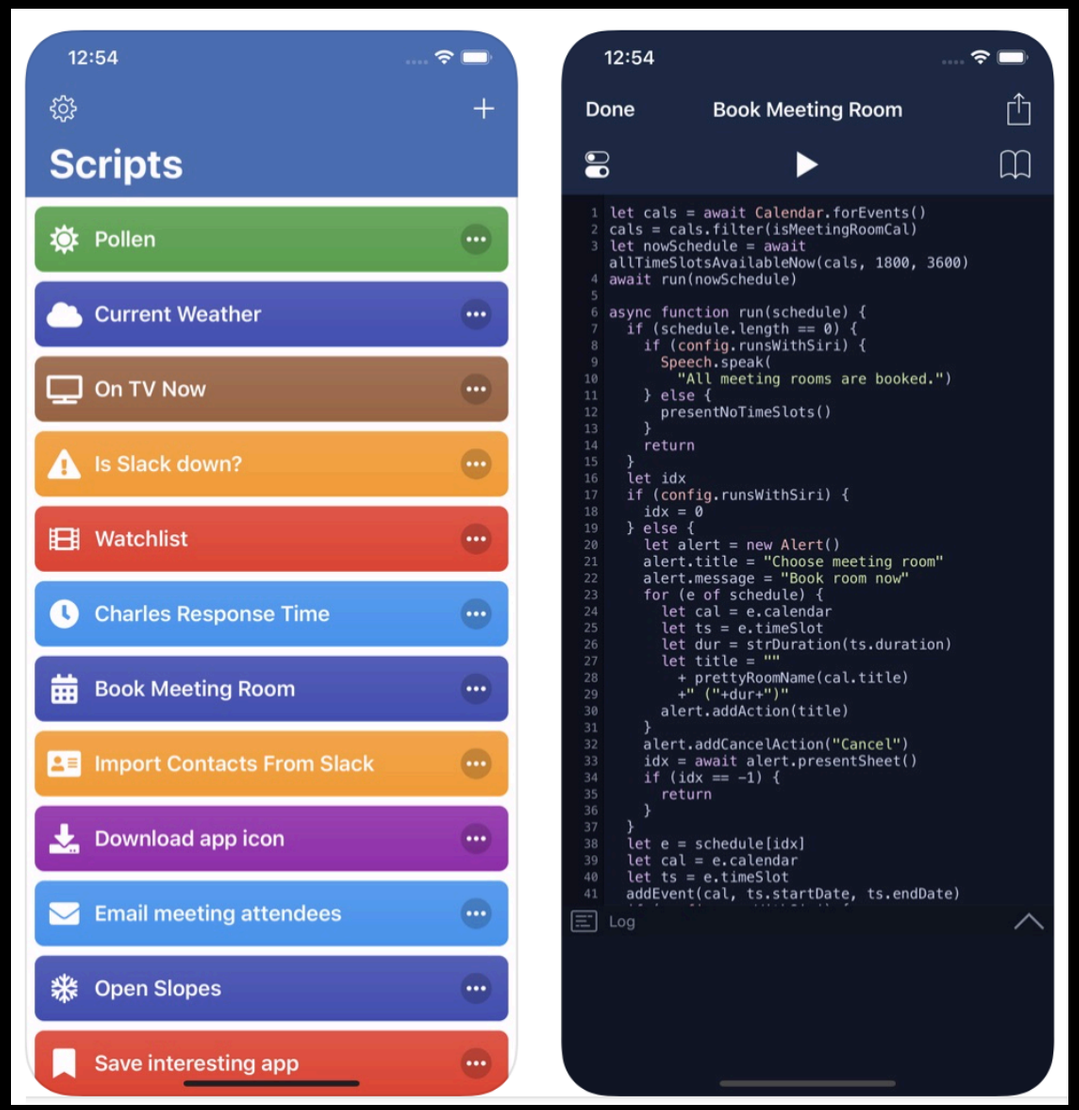
- In iOS 13, Voice Control allows you to control your iOS device with just your voice
- Simulates tapping, swiping and manipulating the screen.
- Can be combined with Shortcuts to perform automations that would otherwise be impossible.

Keyboards, Mice and Accessibility

- Mouse support in iOS 13!
- Can assign commands to mouse buttons
  - Run Shortcut
  - Long Press (e.g. right click)
  - Control Center and Multitasking

Scriptable

- JavaScript automation on iOS.
- Native integration with iOS APIs.
- Can create interfaces and interact with data outside of its own sandbox.



iOS Automation

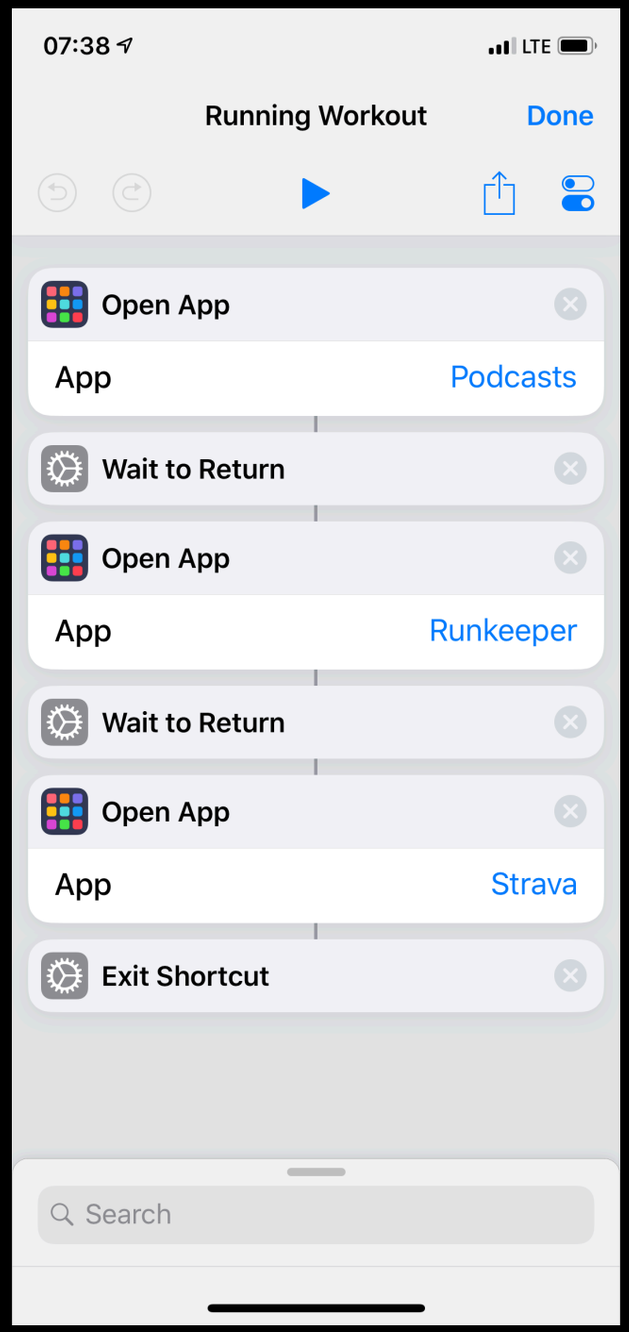
Examples

1. Morning Routine

- Turns on the lights
- Retrieves the weather
- Backs up my shortcuts
- Speaks events and to-dos for today
- Opens Safari to websites I want to read in the morning
- If I ran it once before in the morning, asks me if I want to run it again.

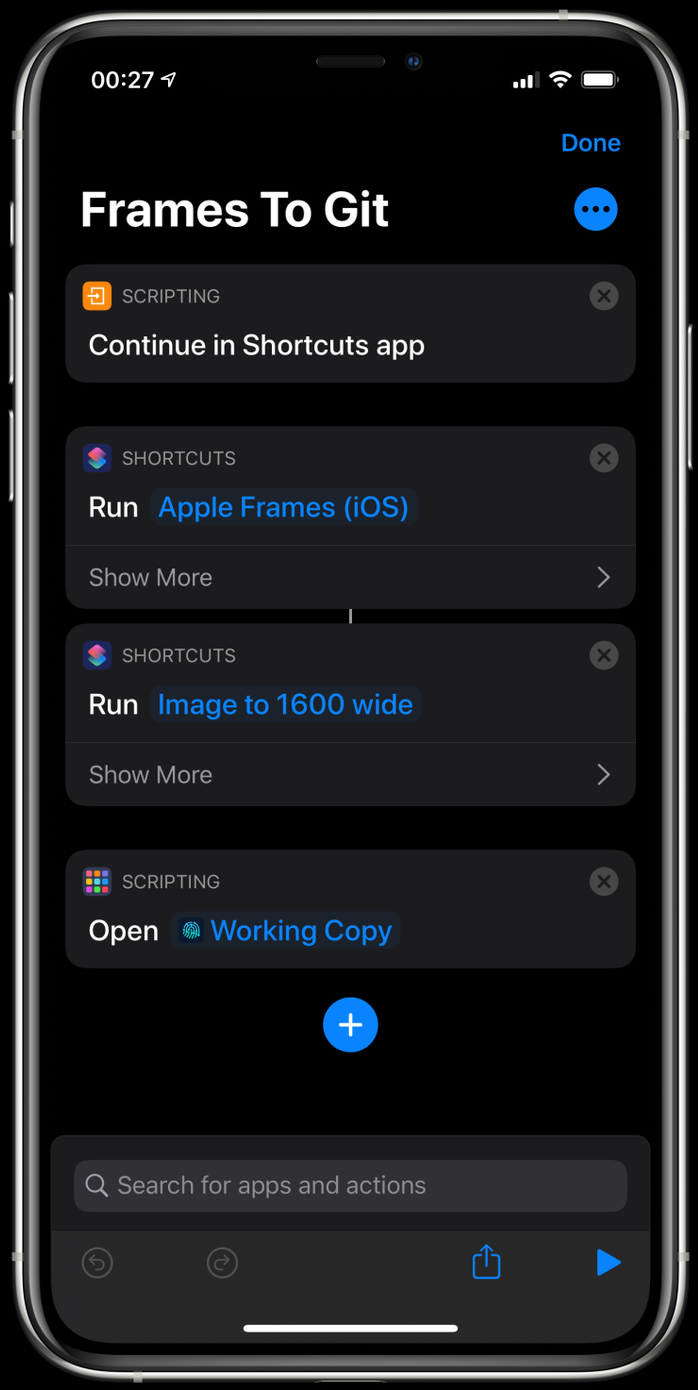
2. Running Workout

- Opens the Podcasts app.
- Starts a Strava workout.
  - Requires iOS 13.
- Opens Runkeeper.
- Waits until I return to the Shortcuts app before running the next step.



3. Frames to Git

- Apple Frames
  - Frederico Vittici from MacStories.
    - Takes screenshots and wraps the proper iOS device chrome around them.
- Created my own shortcut that calls resizes the output from Apple Frames before sending to my Git repos.

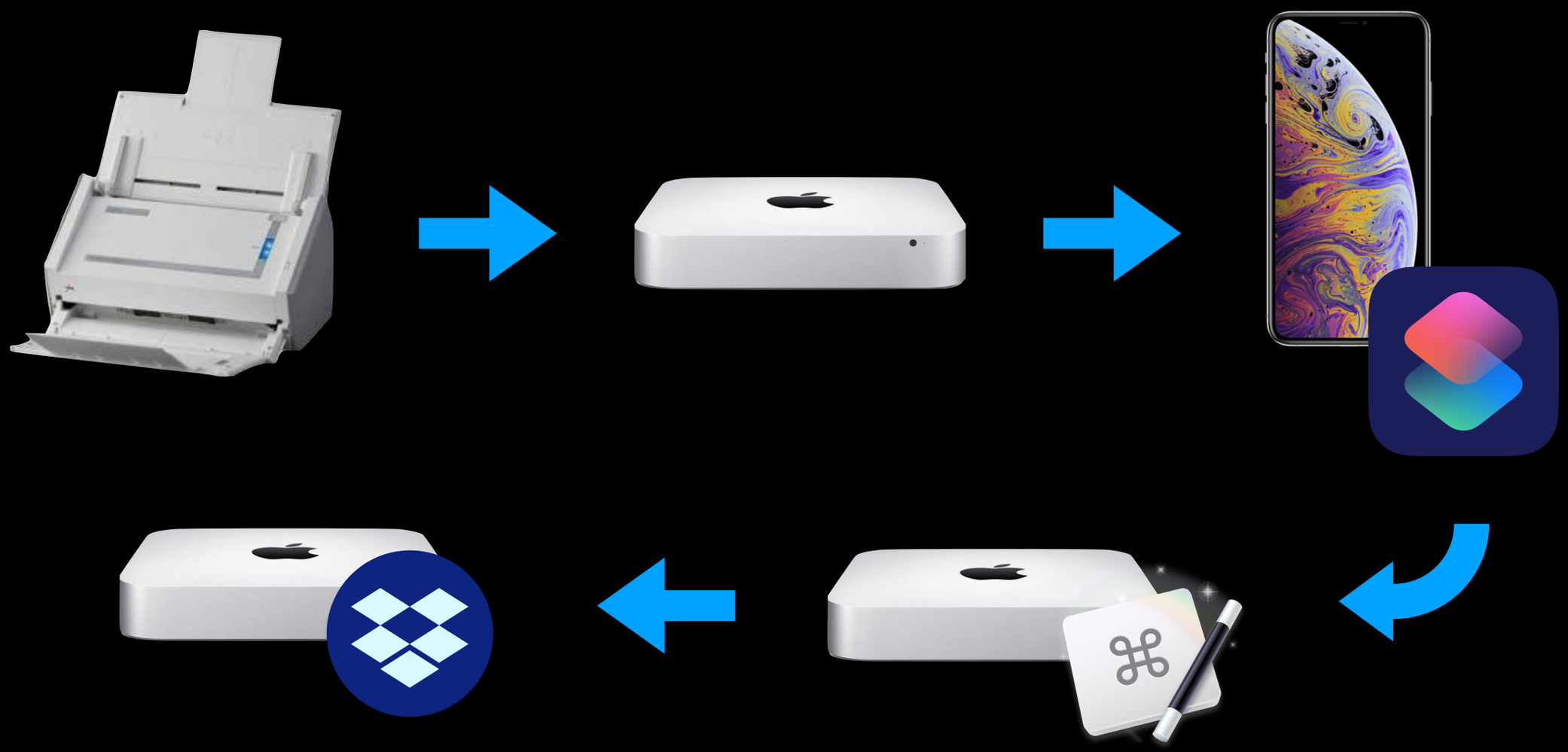


Mac and iOS Automation Examples

1. Finish Scanning

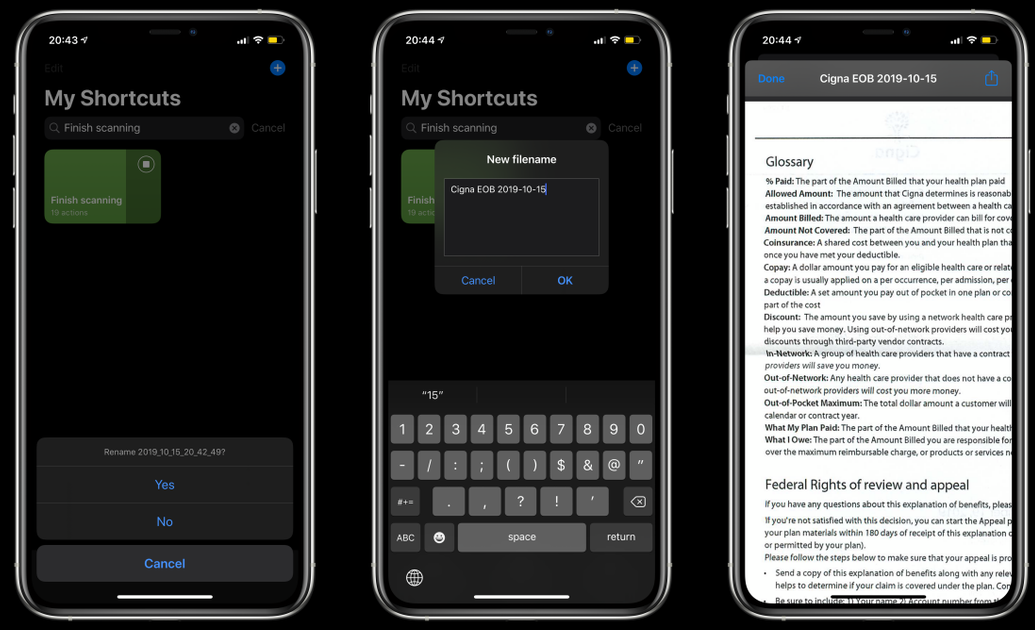
- **iOS Files app or Notes**
  - Provides native file scanning on iOS.
  - Slow when having to scan multiple documents at a time.
- **Fujitsu ScanSnap 1500M**
  - Great for scanning multiples pages at a time.
  - Software is 32-bit and no longer works on Catalina.
  - Attached to Mac Mini at home.
  - Don’t want to use Remote Desktop to have to control it.
  - Goal is to scan multiple pages and tell it when to stop remotely.
  - Rename and save the file automatically to Dropbox.

Finish Scanning Lifecycle



Finish Scanning

- **Shortcut**
  - "Hey Siri, Finish Scanning."
  - Calls the KM shell script from iOS using SSH action.
- **Keyboard Maestro**
  - Clicks the Finish Scanning button.
  - Closes windows in Preview.
  - Triggered by osascript shell command.
- **Shortcut**
  - Previews the scanned document
  - Renames file on Dropbox.
  - Deletes the original file on Dropbox.



2. Wireless DSLR Photography

Wireless DSLR Workflow

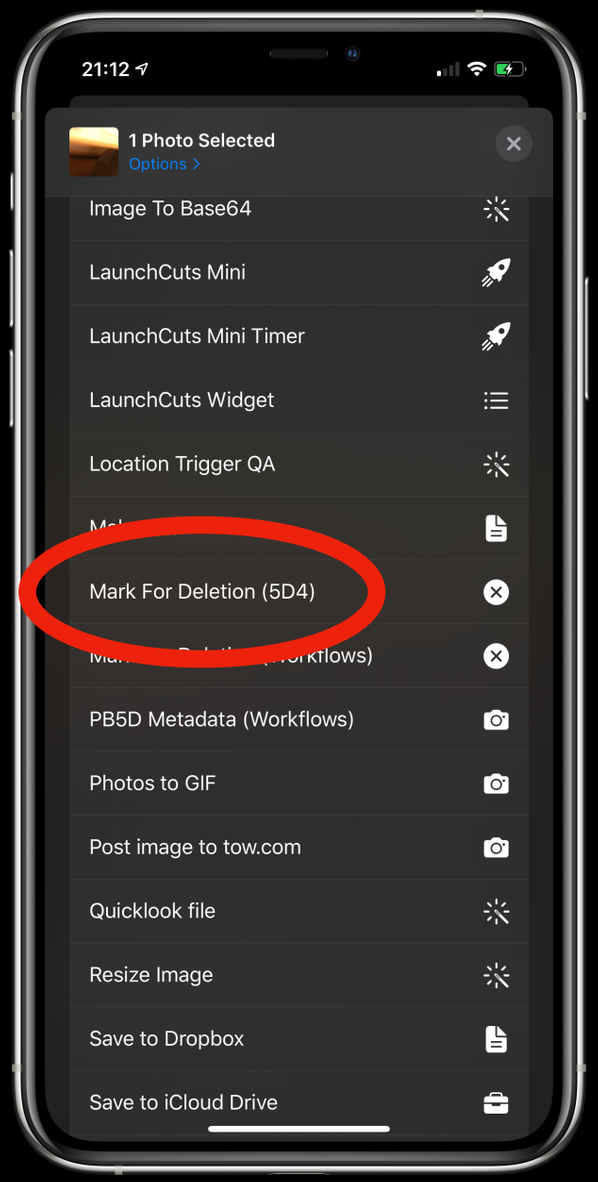
- Shoot with Canon EOS 5D Mark IV
- Supports transferring images using FTP or FTPS using built-in Wi-Fi transmitter.
- Mac mini in the cloud runs FTPS server.
- Hazel, AppleScript, and Exiftool
- Files renamed to final archive name: YYYY-MM-DD_hhmmss_frame4
- Photos added to Photos, Google Photos, Dropbox, and sends me a Message.

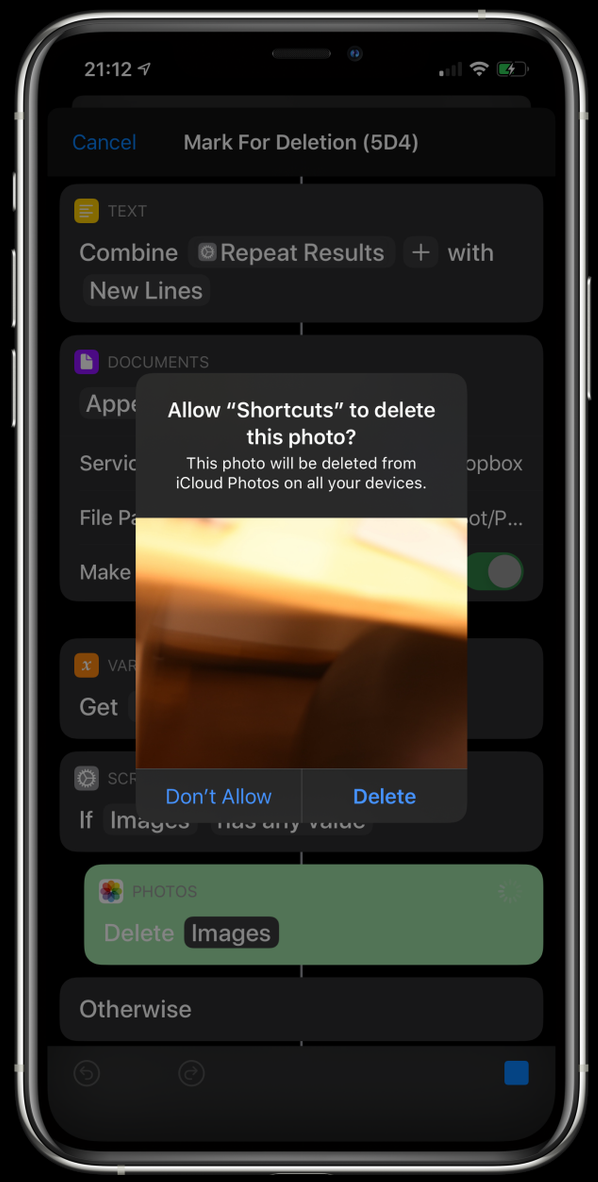
Wireless Photo Demo

3. Mark Photo for Deletion

- Mark a photo in the iOS Photos app
- Filename of image gets appended to a Dropbox file
- When the RAW image is imported to my Mac, marked images will be moved to a To Delete folder.
- These images are not added to Lightroom.

21:12
Today
21:10
Edit


21:12
1 Photo Selected
Options
Image To Base64
LaunchCuts Mini
LaunchCuts Mini Timer
LaunchCuts Widget
Location Trigger QA
Mark For Deletion (5D4)
PB5D Metadata (Workflows)
Photos to GIF
Post image to tow.com
Quicklook file
Resize Image
Save to Dropbox
Save to iCloud Drive


21:12
Cancel
Mark For Deletion (5D4)
TEXT
Combine
Repeat Results
with
New Lines
DOCUMENTS
Allow "Shortcuts" to delete this photo?
This photo will be deleted from iCloud Photos on all your devices.
Don't Allow
Delete
PHOTOS
Delete
Images
Otherwise

PhotosToDelete.txt

Currently Open Documents

PhotosToDelete.txt

~/Dropbox/Automation/Photo.../Preferences/PhotosToDelete.txt

```
204 20180816-183157-0052
205 20180816-182958-0045
206 20180816-183141-0051
207 20180905-130112-0278
208 20180916-110659-0288
209 20181028-154834-7291
210 20181028-154642-7284
211 20181028-154021-7262
212 20191011-163123-0414
213 20191015-211052-0497
```

L: 213 C: 1 Text File Unicode (UTF-8) Unix (LF) 20 / 3 / 1

100% Oct 15 21:20:15

Today Notifications

Today

HAZELHELPER now

File moved into subfolder
20191015-211052-0497.cr2 sorted from folder Inbox to subfolder Marked For Deletion.

Marked For Deletion

Back/Forward View Group Action Share Edit Tags

20191015-211052-0497.cr2

106 items, 2.14 TB available

One More Thing…

Autocuts

Autocuts

- Remember how I said some Personal Automation triggers on iOS 13 require confirmation?
- And how iOS can’t act as a mini-server?
- Autocuts, released earlier this week, aims to change that.
    - At least until iOS 14 when they Sherlock Autocuts!

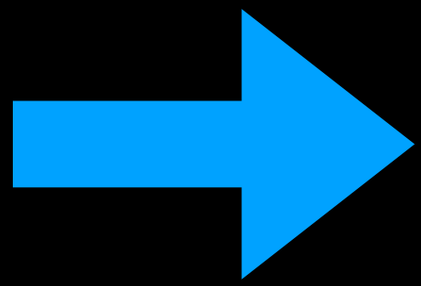
Autocuts

- Autocuts is a background shortcut manager for iOS 13.
- Launched via the Open App personal automation.
- Runs shortcuts automatically in the background while you use your iOS device.

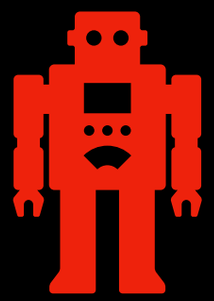
Autocuts

- Enables auto-running of time, location, and Wi-Fi triggers.
- Integrates with IFTTT, Zapier, or other web integration service with your iOS device.
- Shows what could be possible if iOS was able to act more like an always on server.

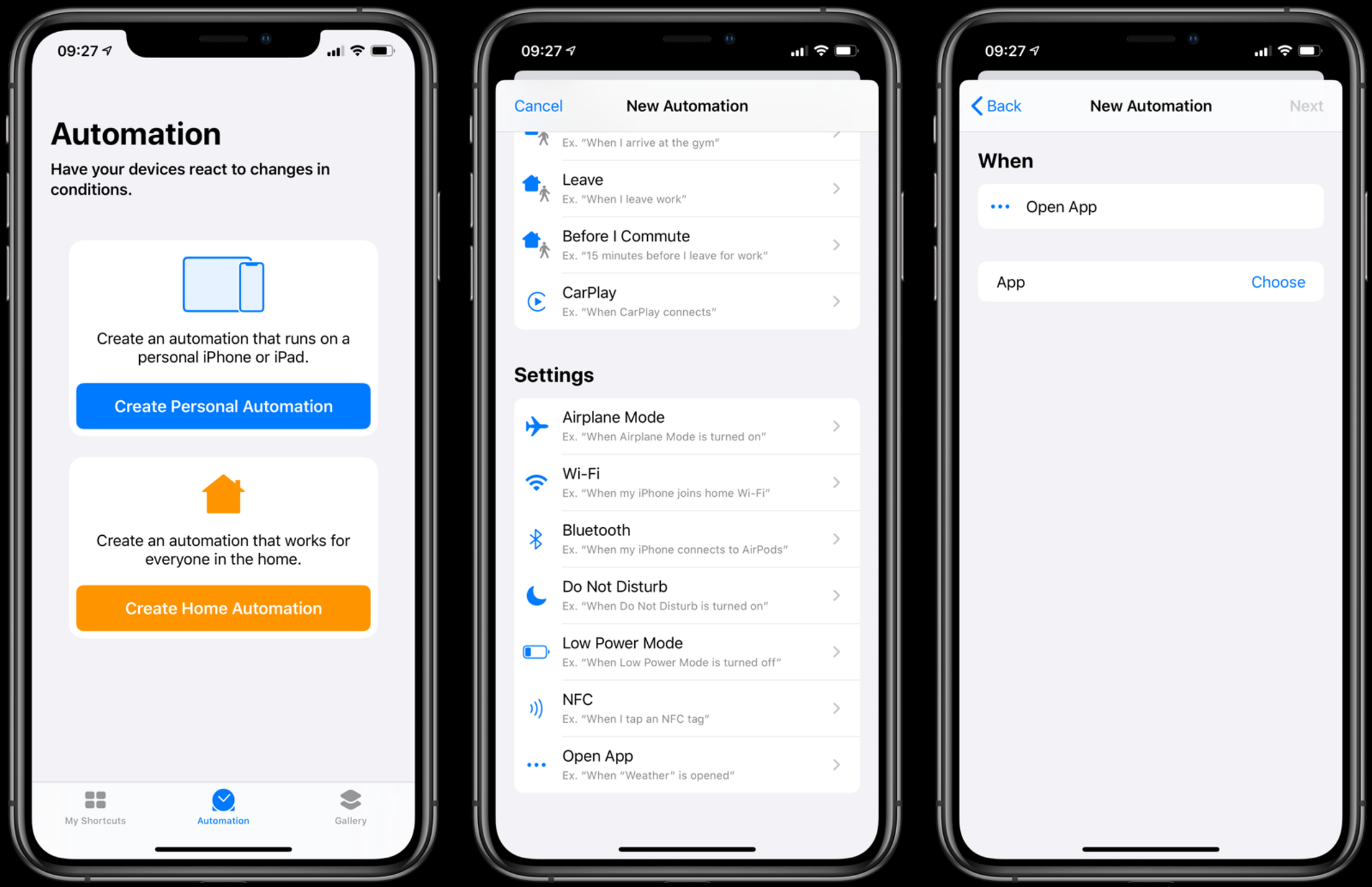
Confirmation-Based Automations



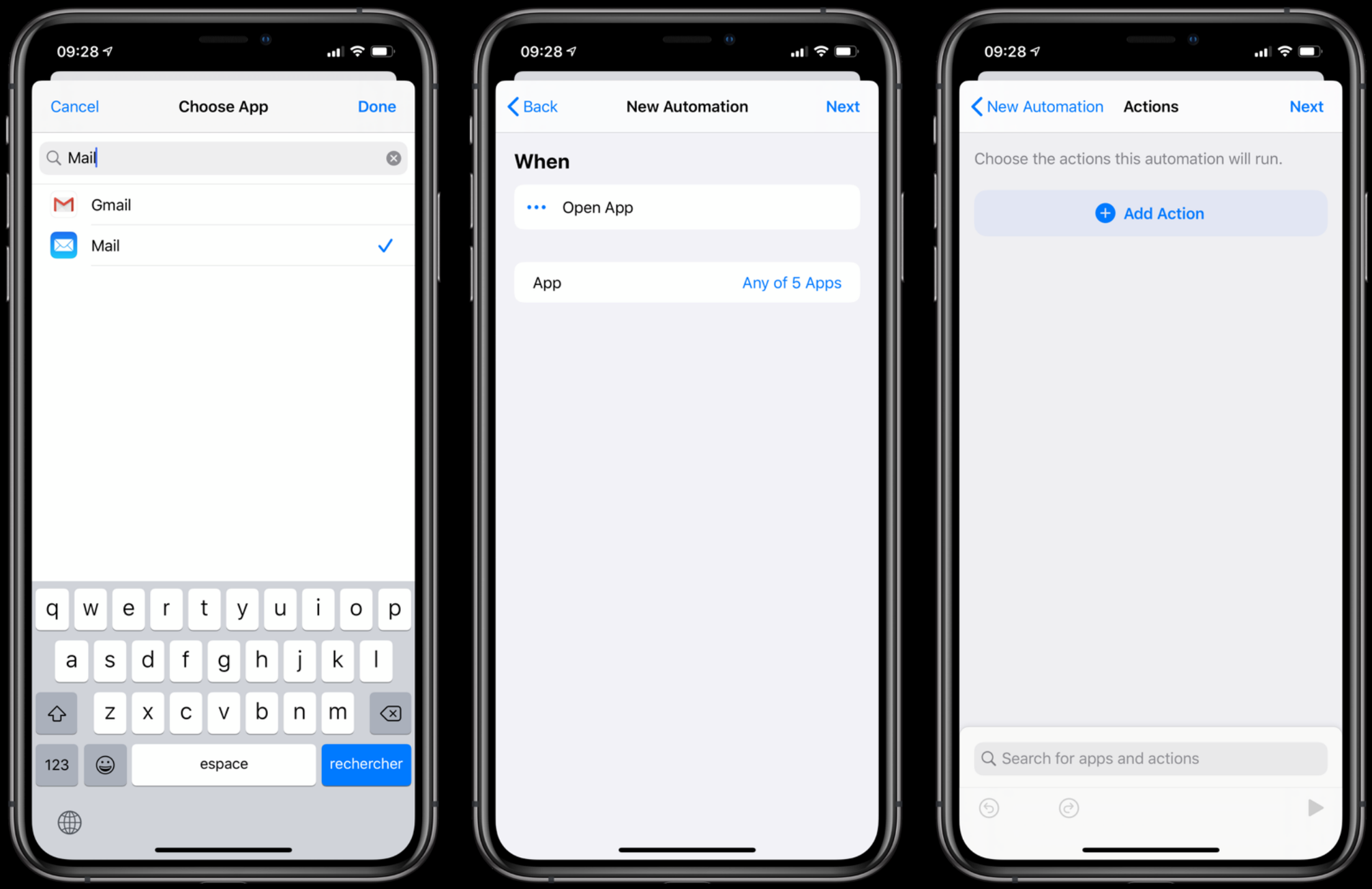
Autocuts Usage-Based Automation



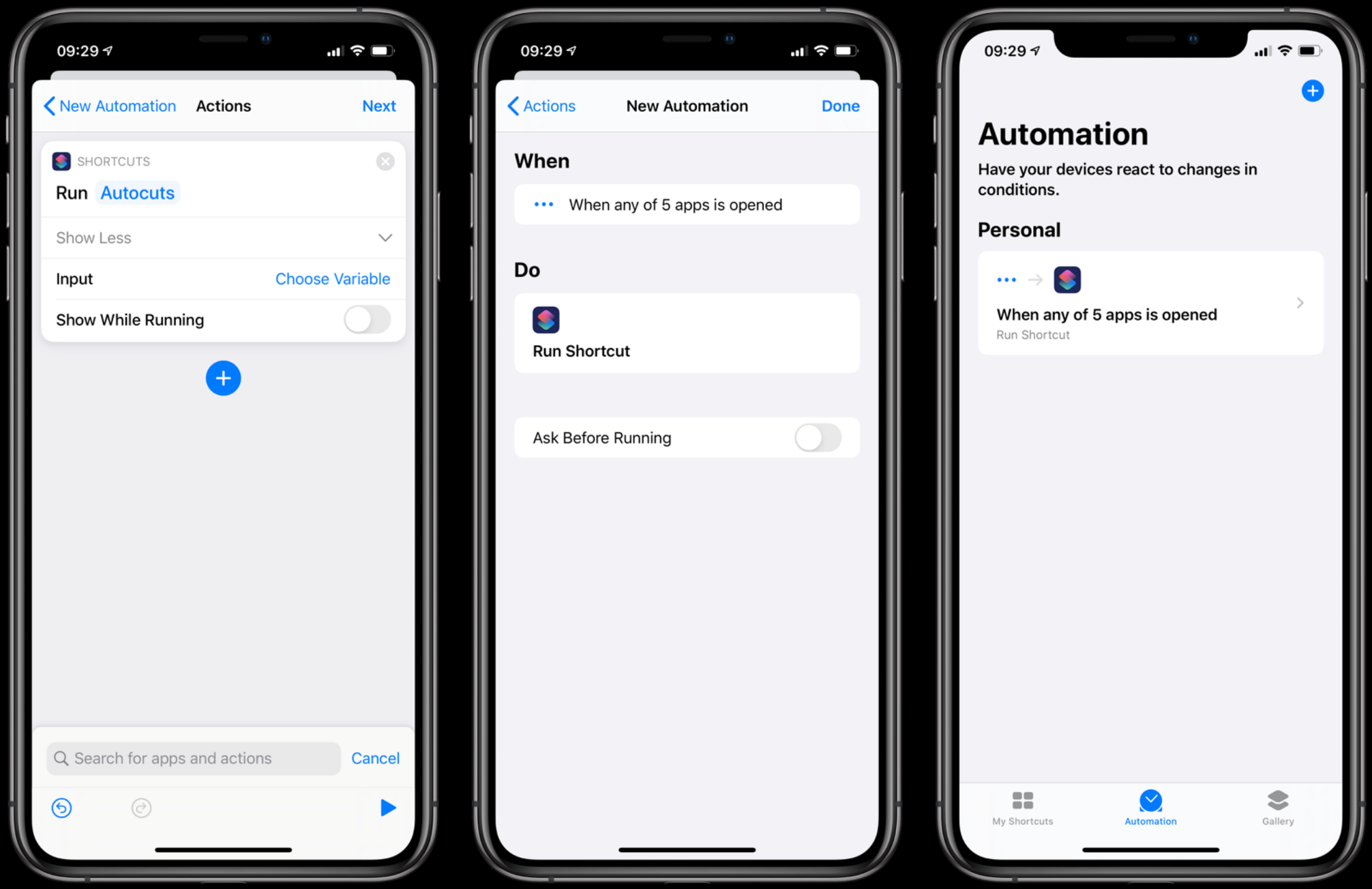
Autocuts Setup #1



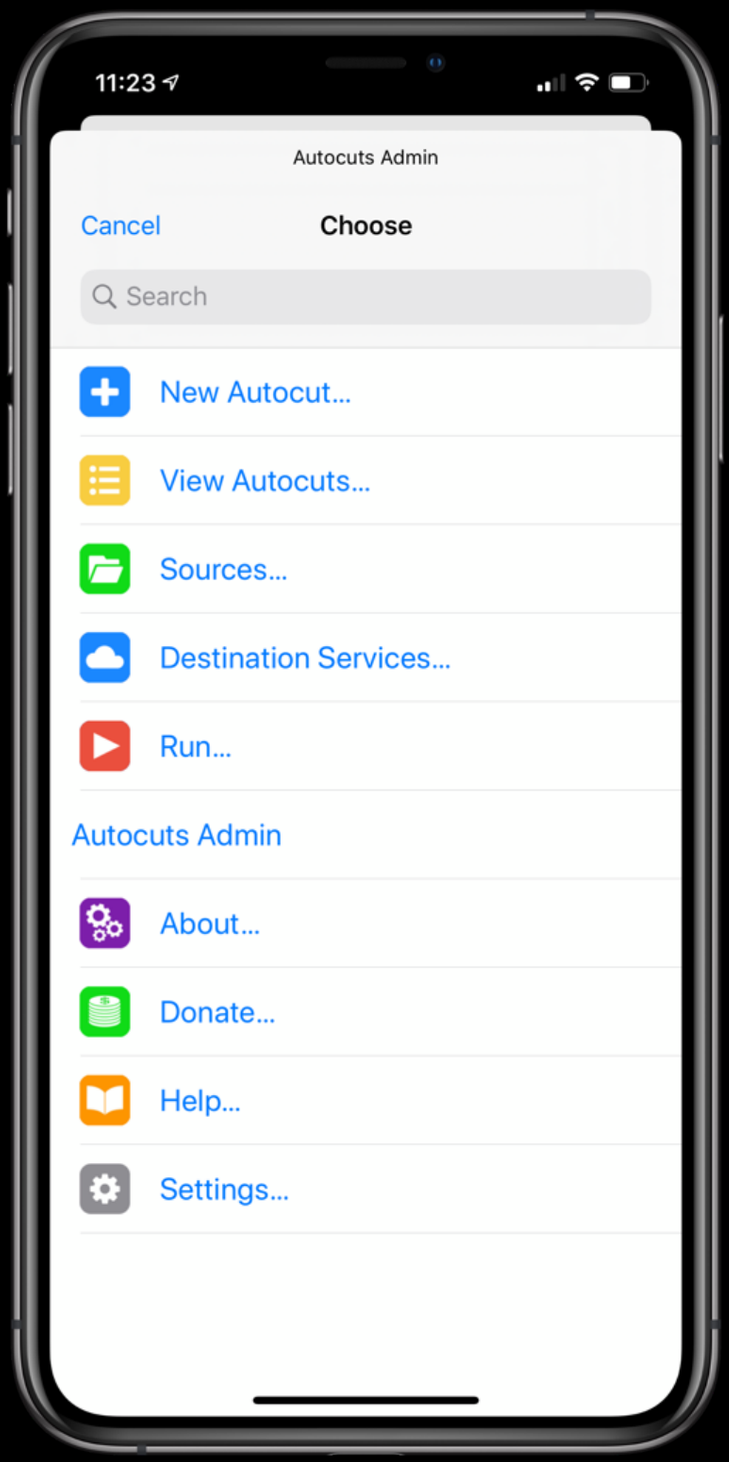
Autocuts Setup #2

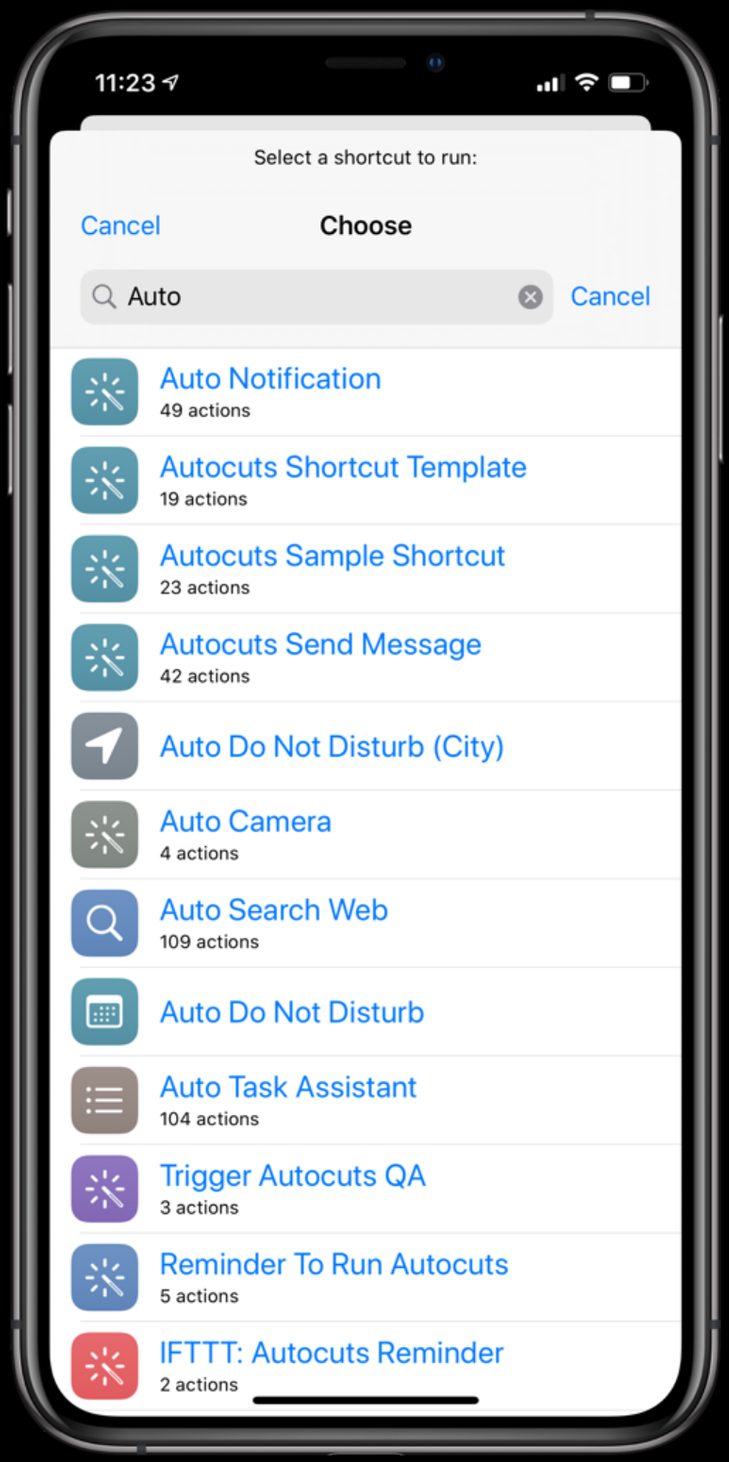


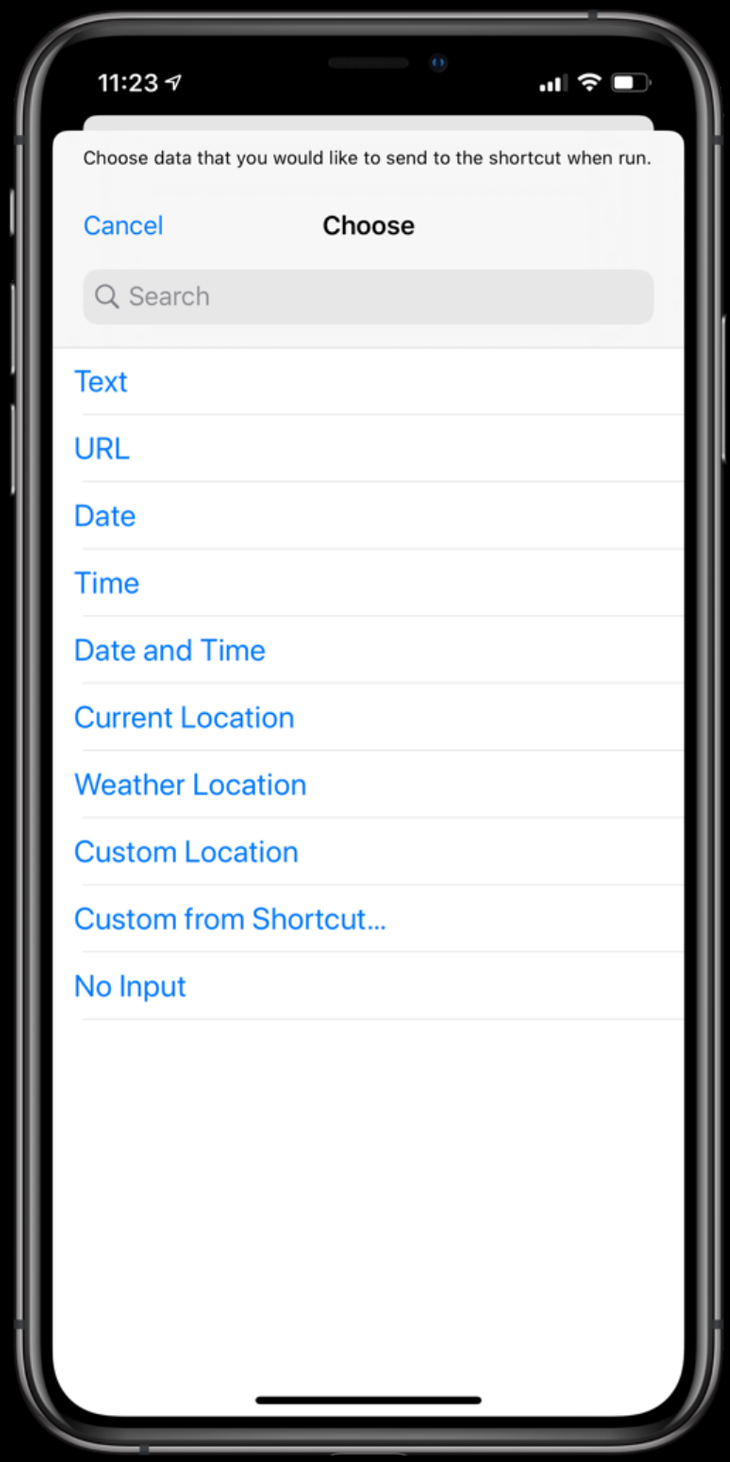
Autocuts Setup #3

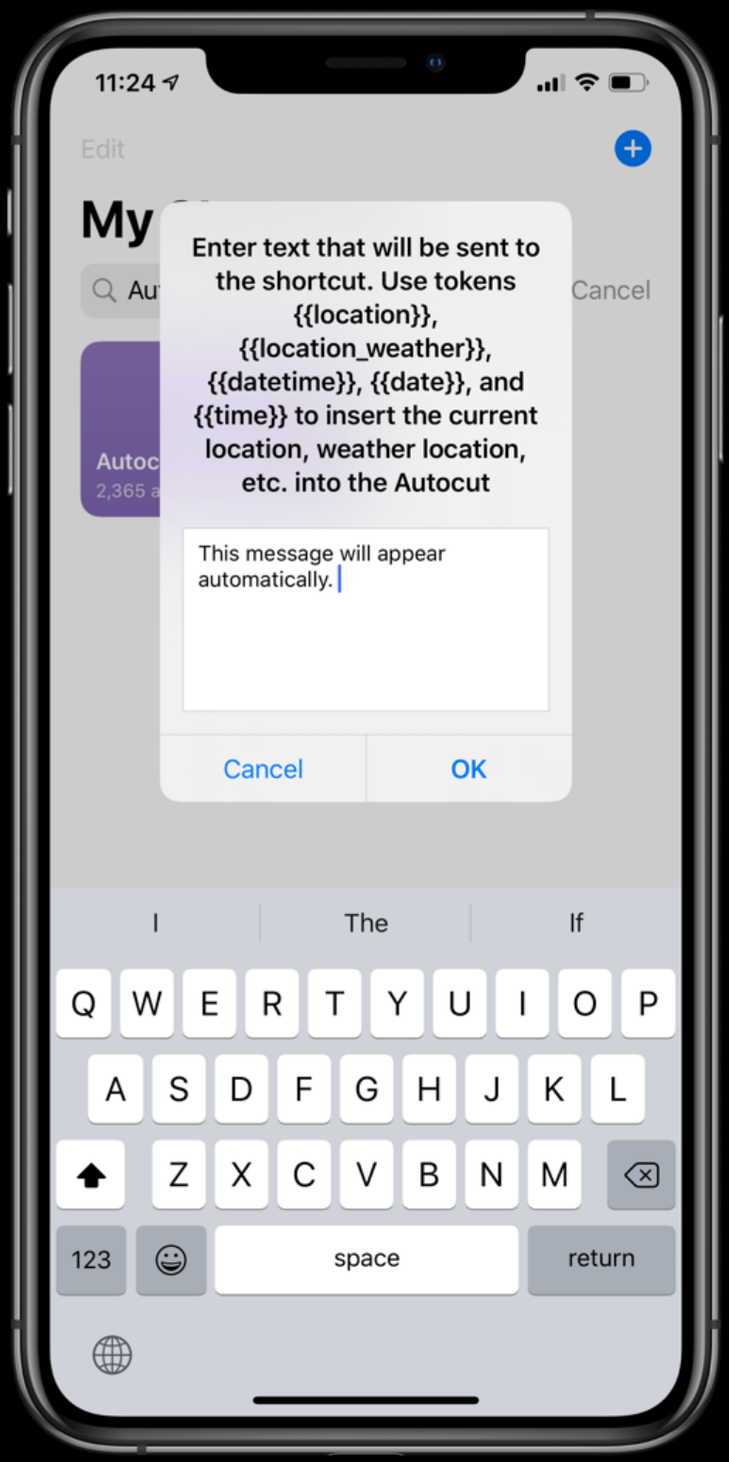


Creating an Autocut


11:23
Autocuts Admin
Cancel
Choose
Search
New Autocut...
View Autocuts...
Sources...
Destination Services...
Run...
Autocuts Admin
About...
Donate...
Help...
Settings...

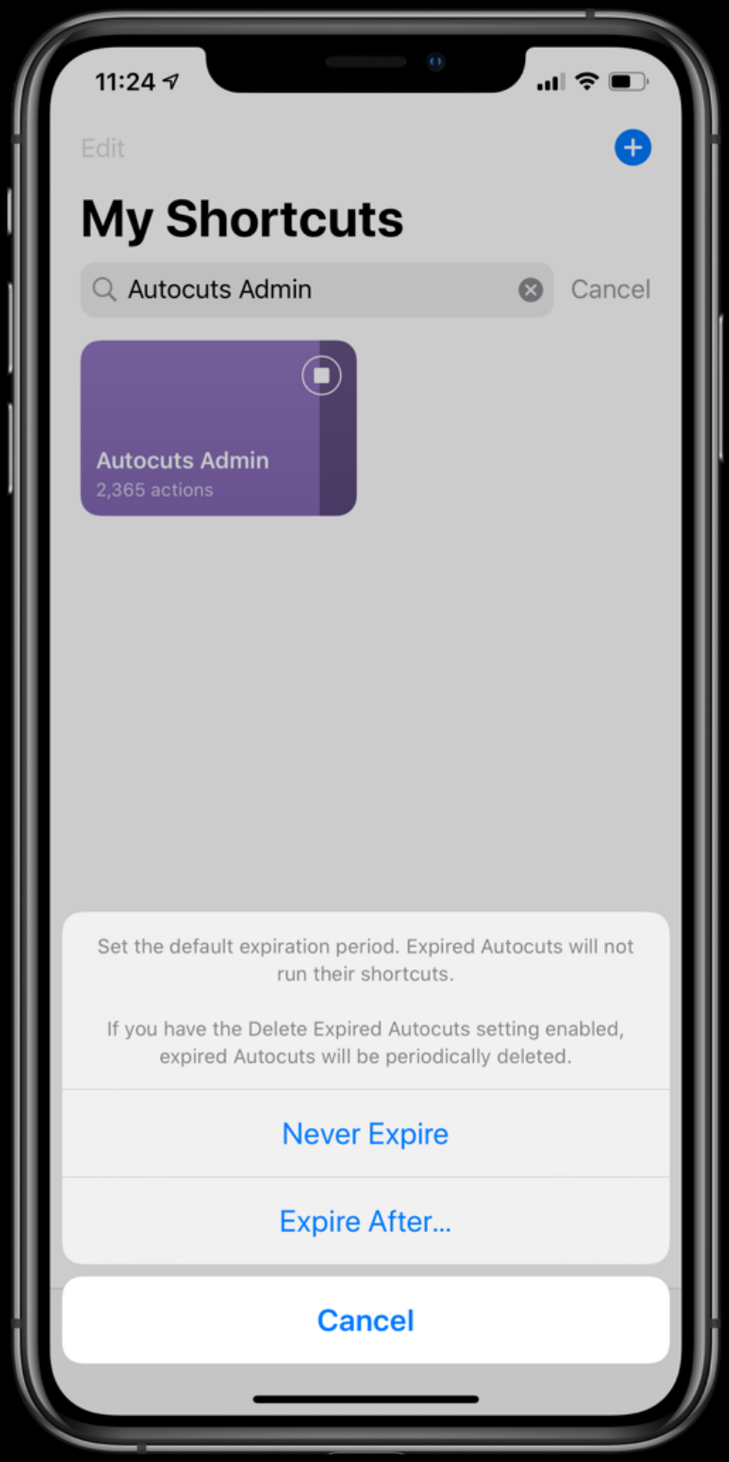

11:23
Select a shortcut to run:
Cancel
Choose
Auto
Cancel
Auto Notification
49 actions
Autocuts Shortcut Template
19 actions
Autocuts Sample Shortcut
23 actions
Autocuts Send Message
42 actions
Auto Do Not Disturb (City)
Auto Camera
4 actions
Auto Search Web
109 actions
Auto Do Not Disturb
Auto Task Assistant
104 actions
Trigger Autocuts QA
3 actions
Reminder To Run Autocuts
5 actions
IFTTT: Autocuts Reminder
2 actions

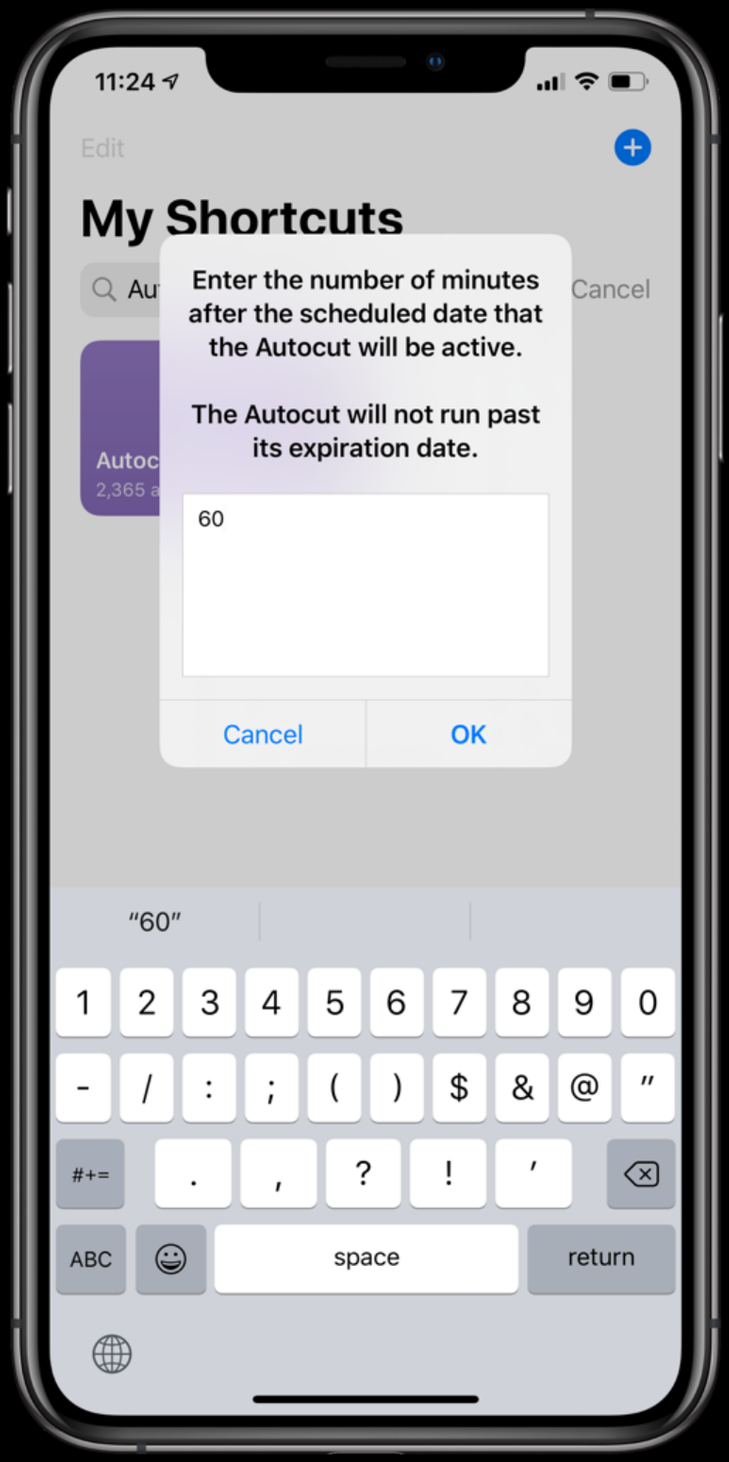

11:23
Choose data that you would like to send to the shortcut when run.
Cancel
Choose
Search
Text
URL
Date
Time
Date and Time
Current Location
Weather Location
Custom Location
Custom from Shortcut...
No Input

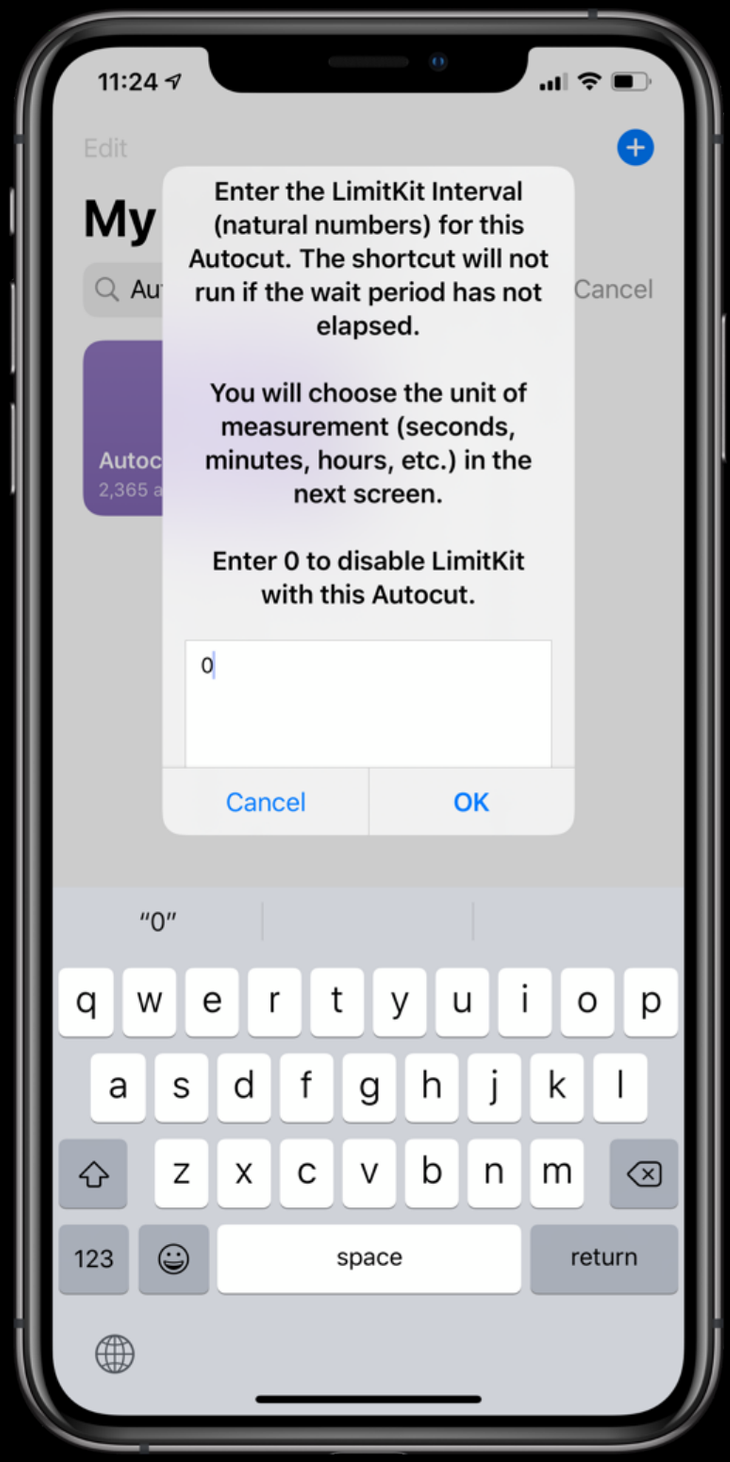

11:24
Edit
My
Au
Cancel
Autoc
2,365 a
Enter text that will be sent to the shortcut. Use tokens {{location}}, {{location_weather}}, {{datetime}}, {{date}}, and {{time}} to insert the current location, weather location, etc. into the Autocut
This message will appear automatically.
Cancel
OK
I
The
If
Q 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
return

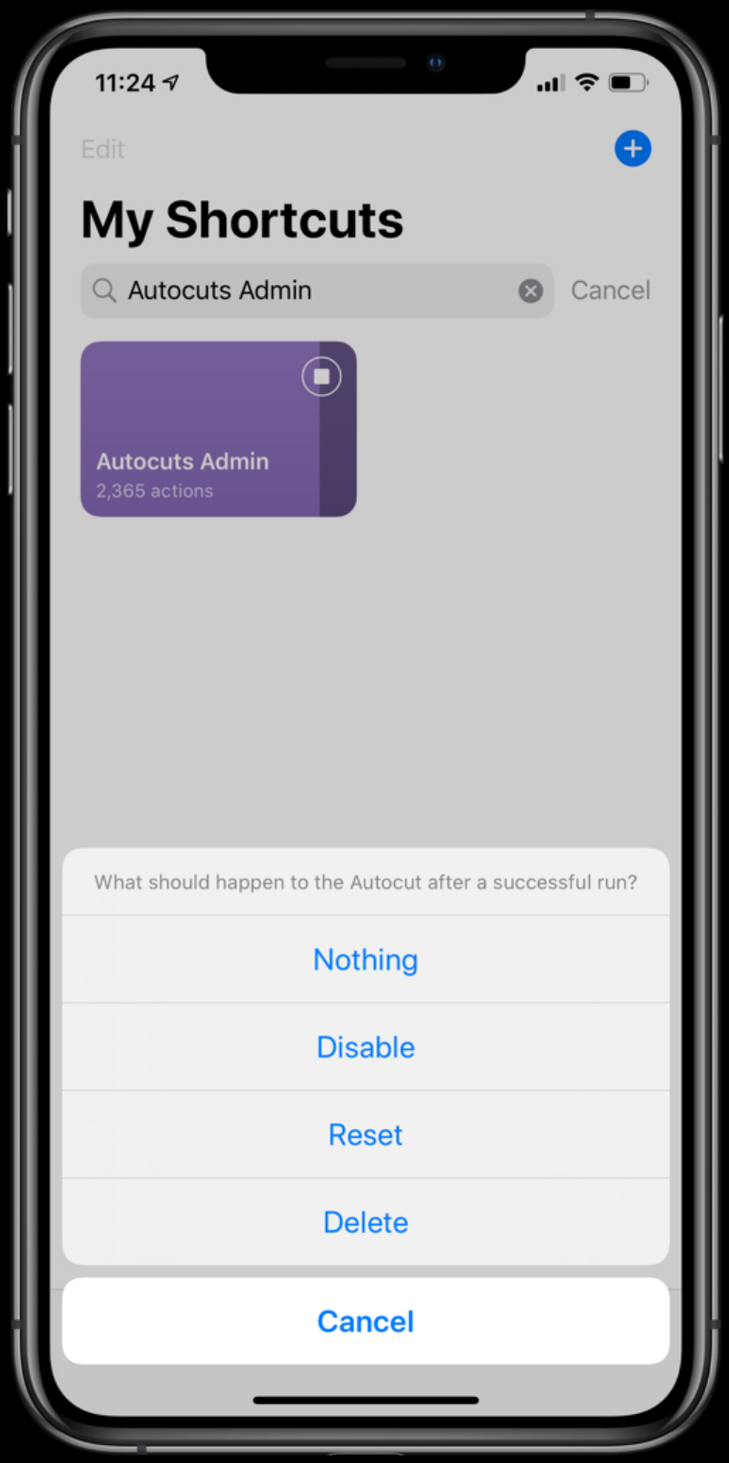
11:24
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
Run the shortcut in the background or open the Shortcuts app before running?
NOTE: Some shortcuts require the Shortcuts app to be the active application in order to run properly.
Run in Background
Open Shortcuts Before Running
Cancel

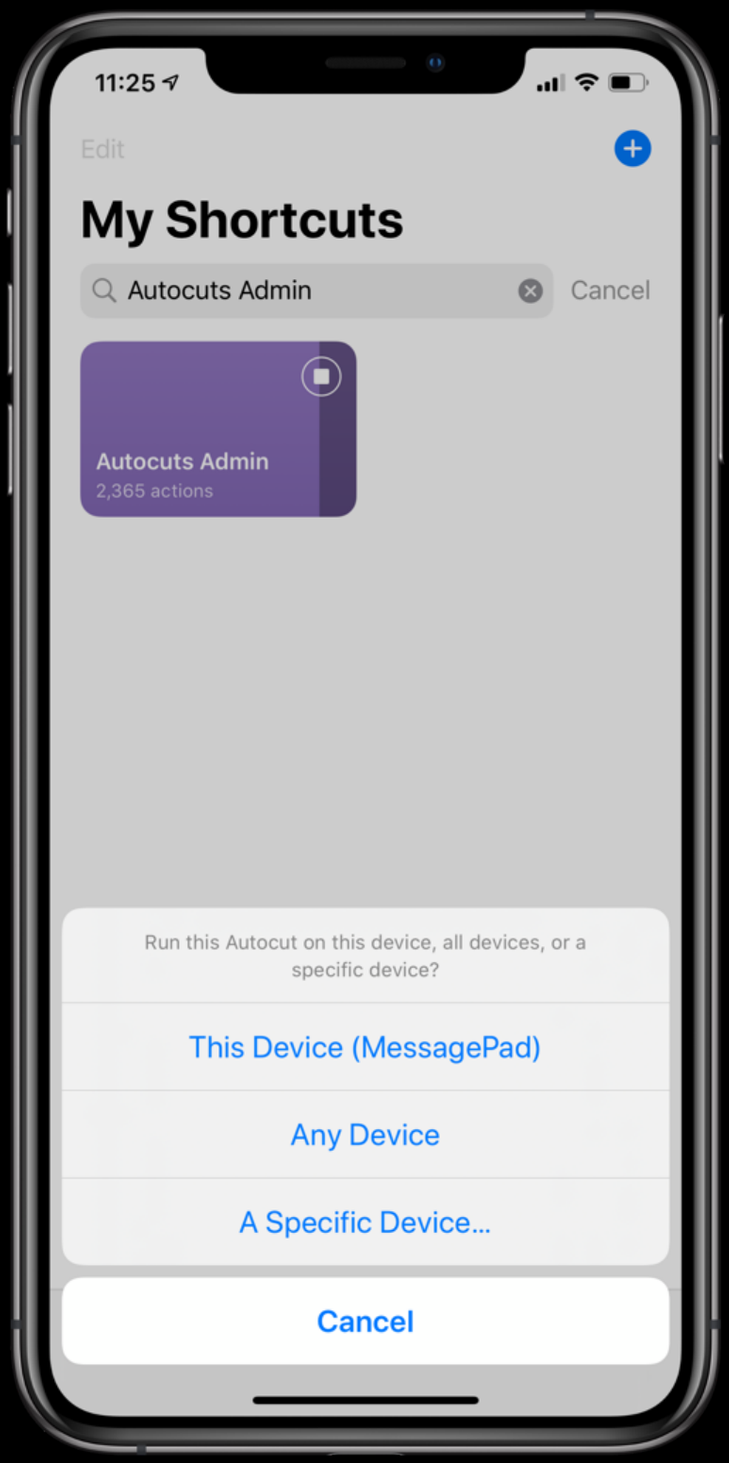
11:24
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
Enter a date that will be sent to the shortcut when it runs.
Wed Oct 9 09 21
Thu Oct 10 10 22
Today 11 23
Sat Oct 12 12 24
Sun Oct 13 13 25
Cancel
OK
My Shortcuts
Automation
Gallery

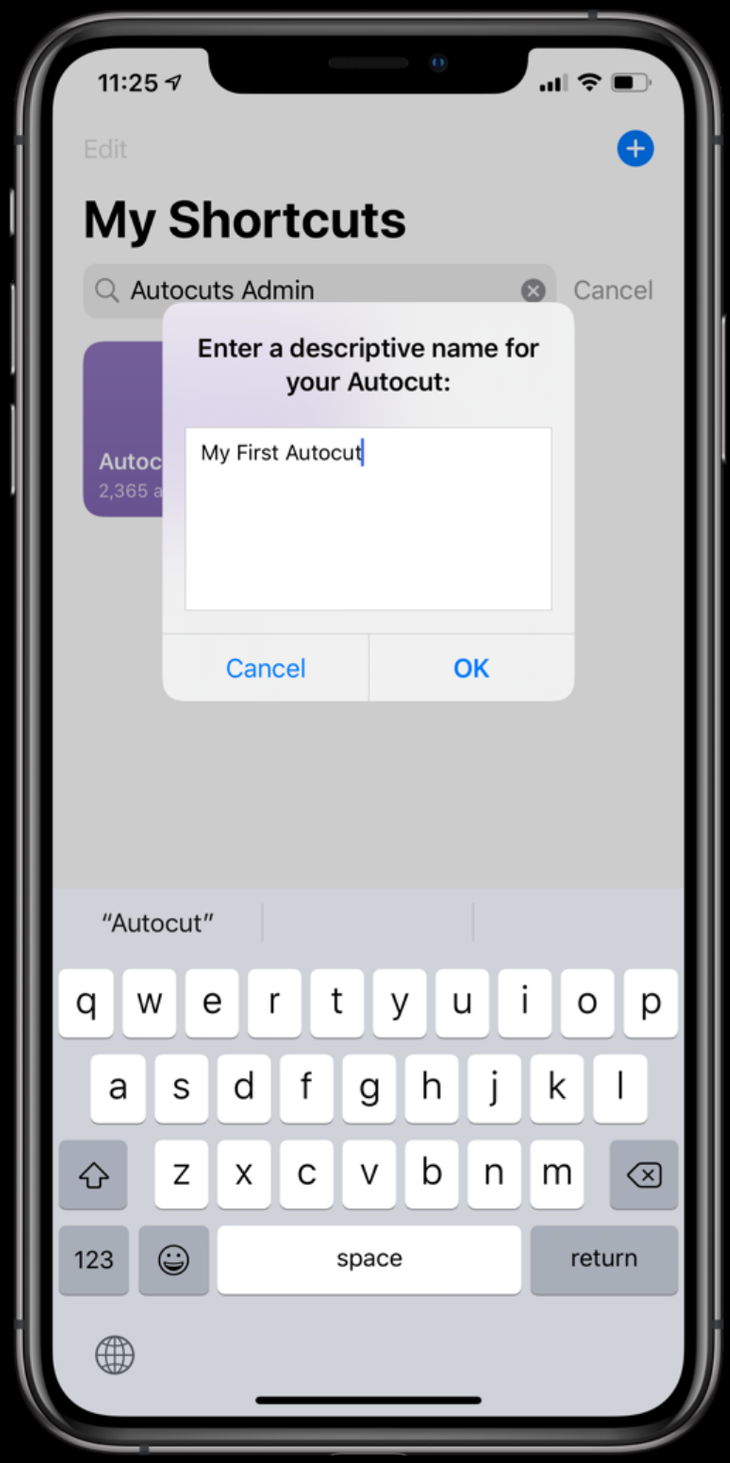

11:24
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
Set the default expiration period. Expired Autocuts will not run their shortcuts.
If you have the Delete Expired Autocuts setting enabled, expired Autocuts will be periodically deleted.
Never Expire
Expire After...
Cancel

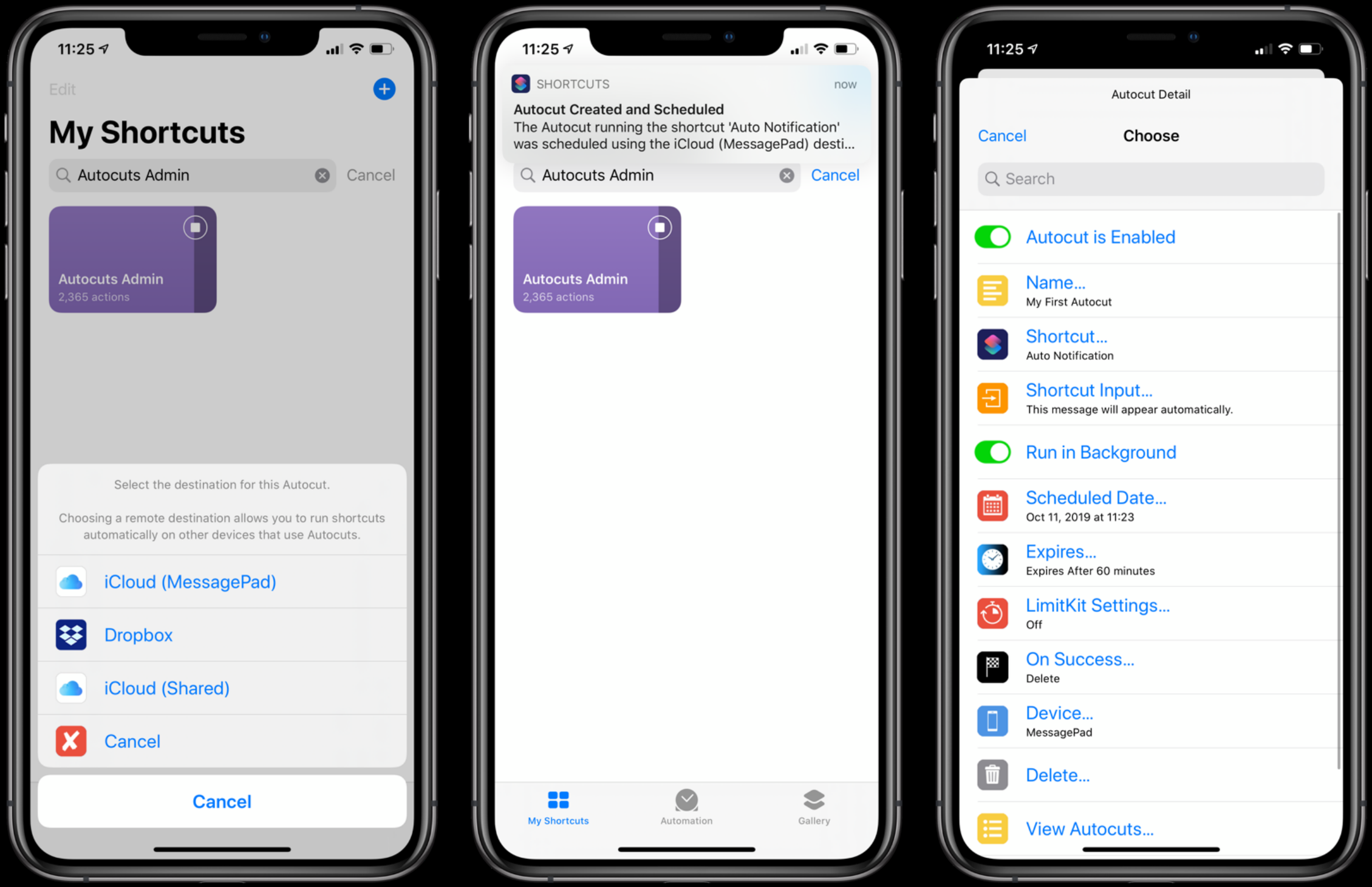

11:24
Edit
My Shortcuts
Cancel
Enter the number of minutes after the scheduled date that the Autocut will be active.
The Autocut will not run past its expiration date.
60
Cancel
OK
"60"
1 2 3 4 5 6 7 8 9 0
- / : ; ( ) $ & @ "
#+= . , ? ! '
ABC
space
return


11:24
Edit
My
Cancel
Enter the LimitKit Interval (natural numbers) for this Autocut. The shortcut will not run if the wait period has not elapsed.
You will choose the unit of measurement (seconds, minutes, hours, etc.) in the next screen.
Enter 0 to disable LimitKit with this Autocut.
0
Cancel
OK
"0"
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
return


11:24
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
What should happen to the Autocut after a successful run?
Nothing
Disable
Reset
Delete
Cancel


11:25
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
Run this Autocut on this device, all devices, or a specific device?
This Device (MessagePad)
Any Device
A Specific Device...
Cancel


11:25
Edit
My Shortcuts
Autocuts Admin
Cancel
Enter a descriptive name for your Autocut:
My First Autocut
Cancel
OK
"Autocut"
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
return


11:25
Edit
My Shortcuts
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
Select the destination for this Autocut.
Choosing a remote destination allows you to run shortcuts automatically on other devices that use Autocuts.
iCloud (MessagePad)
Dropbox
iCloud (Shared)
Cancel
Cancel
11:25
SHORTCUTS
now
Autocut Created and Scheduled
The Autocut running the shortcut 'Auto Notification' was scheduled using the iCloud (MessagePad) desti...
Autocuts Admin
Cancel
Autocuts Admin
2,365 actions
My Shortcuts
Automation
Gallery
11:25
Autocut Detail
Cancel
Choose
Search
Autocut is Enabled
Name...
My First Autocut
Shortcut...
Auto Notification
Shortcut Input...
This message will appear automatically.
Run in Background
Scheduled Date...
Oct 11, 2019 at 11:23
Expires...
Expires After 60 minutes
LimitKit Settings...
Off
On Success...
Delete
Device...
MessagePad
Delete...
View Autocuts...

Autocuts Demo

Auto DND

Auto Notification

More Autocuts

- Wi-Fi Triggers
- Location Triggers
- Battery Level Triggers
- Web-based Triggers
    - IFTTT and Zapier

Where to Get Autocuts

https://adamtow.github.io/autocuts-admin

Resources

- Automators Forum: talk.automators.fm
- Shortcuts Reddit: reddit.com/r/shortcuts
- Hazel Forum: www.noodlesoft.com/forums
- Keyboard Maestro Forum: forum.keyboardmaestro.com