

6.1040: Software Design

Problems that *Matter*:
Value Sensitive Design

Arvind Satyanarayan & Max Goldman



Poster by Alvy Brooks (@alvybrooks)



Photo from Sam Altman (@sama)

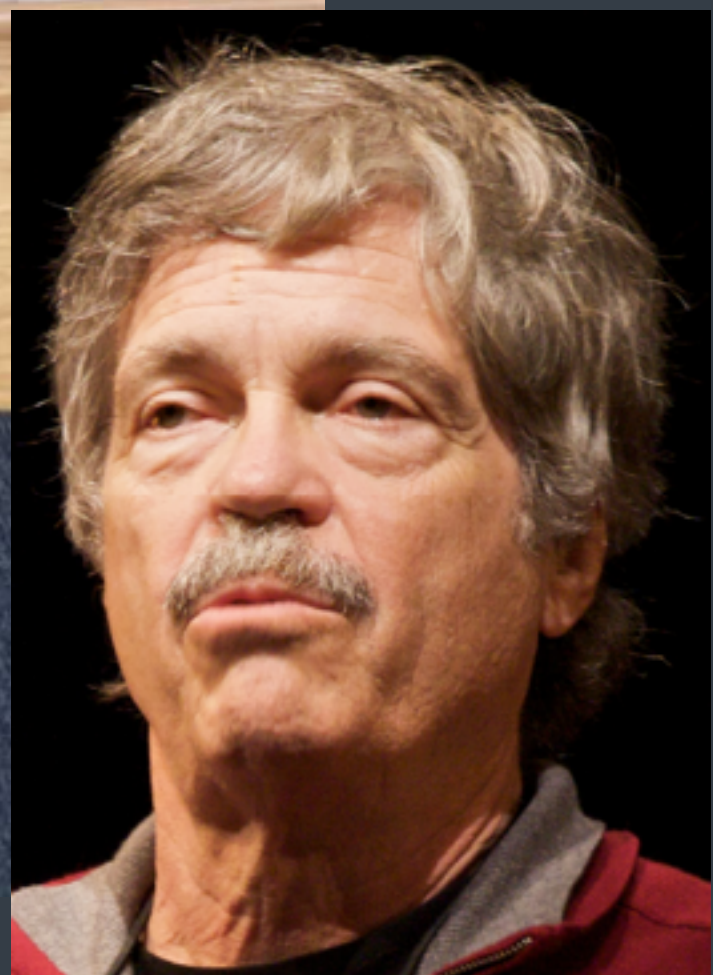


Photo by Marcin Wicharyz



Brussels



**Need finding / empathy building
*is not enough***

Value Sensitive Design

Designers often focus on the **immediate context of use**: how will a product be used by the person who purchases it?

Designers rarely have the time to **consider the long-term and indirect effects of their technologies.**

VALUE SENSITIVE DESIGN

SHAPING
TECHNOLOGY
WITH MORAL
IMAGINATION



BATYA FRIEDMAN
DAVID G. HENDRY





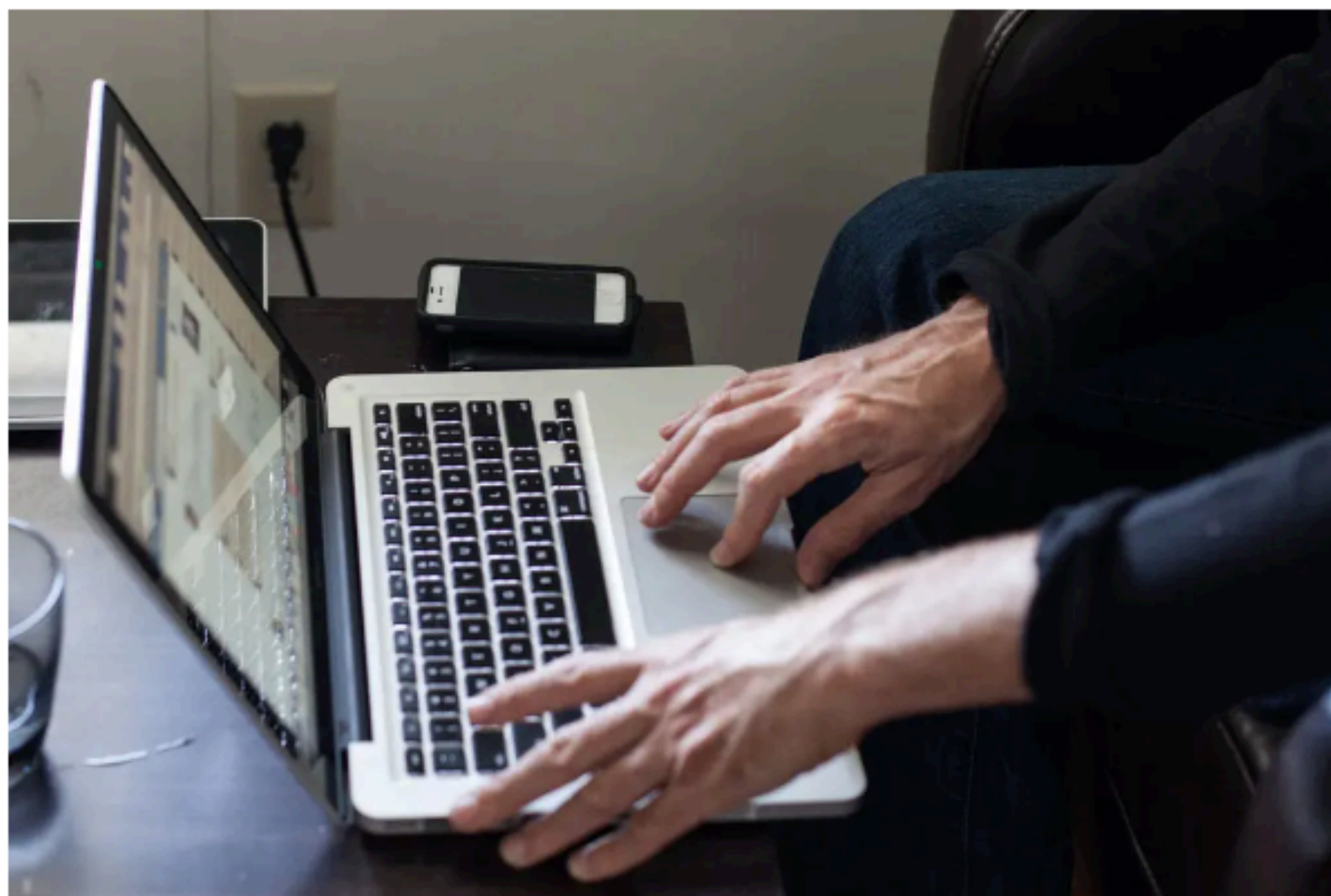
HOME > TECH

Former Facebook exec feels 'tremendous guilt' for what he helped make

Steve Kovach Dec 11, 2017, 11:09 AM EST



Silicon Valley Says Step Away From the Device



Tech firms are uneasy over the effect time online has on relationships. Annie Tritt for The New York Times

By [Matt Richte!](#)

July 23, 2012

OUR BEST OFFER WON'T LAST:
\$1 a week for your first year.





Value Sensitive Design: 4 Criteria

Stakeholders

Describes the range of effects both on the people who are in direct contact with the technology, as well as those who might not be direct users, but whose lives are nevertheless affected by various interactions around the technology.

Time

Consider the implications that will only emerge after the technology has moved through initial phases of novelty to later phases of appropriation and integration into society.

Pervasiveness

Systemic interactions that follow from the widespread adoption of an interactive technology.

Values

What do people consider important in life? E.g., autonomy, community, cooperation, democratization, environmental sustainability, fairness, dignity.

Value Sensitive Design: 4 Criteria

Stakeholders

Direct Stakeholders · Indirect Stakeholders · Non-targeted Use
Children · Variation in Abilities · Changing Hands · One Person, Many Roles

Time

The Long Now · Long-Term Health & Well-Being · Sustained Friendships
Work of the Future · Adaptation · Non-Use · Obsolescence · Reappropriation

Pervasiveness

Widespread Use · Diverse Geographies · Crossing National Boundaries
Accounting for Culture · Political Realities

Values

Elicit Stakeholder Values · Consider Key Values at Stake · Choose Desired Values
Evaluate User Experience of Values · Value Tensions · Perceptions of a Value

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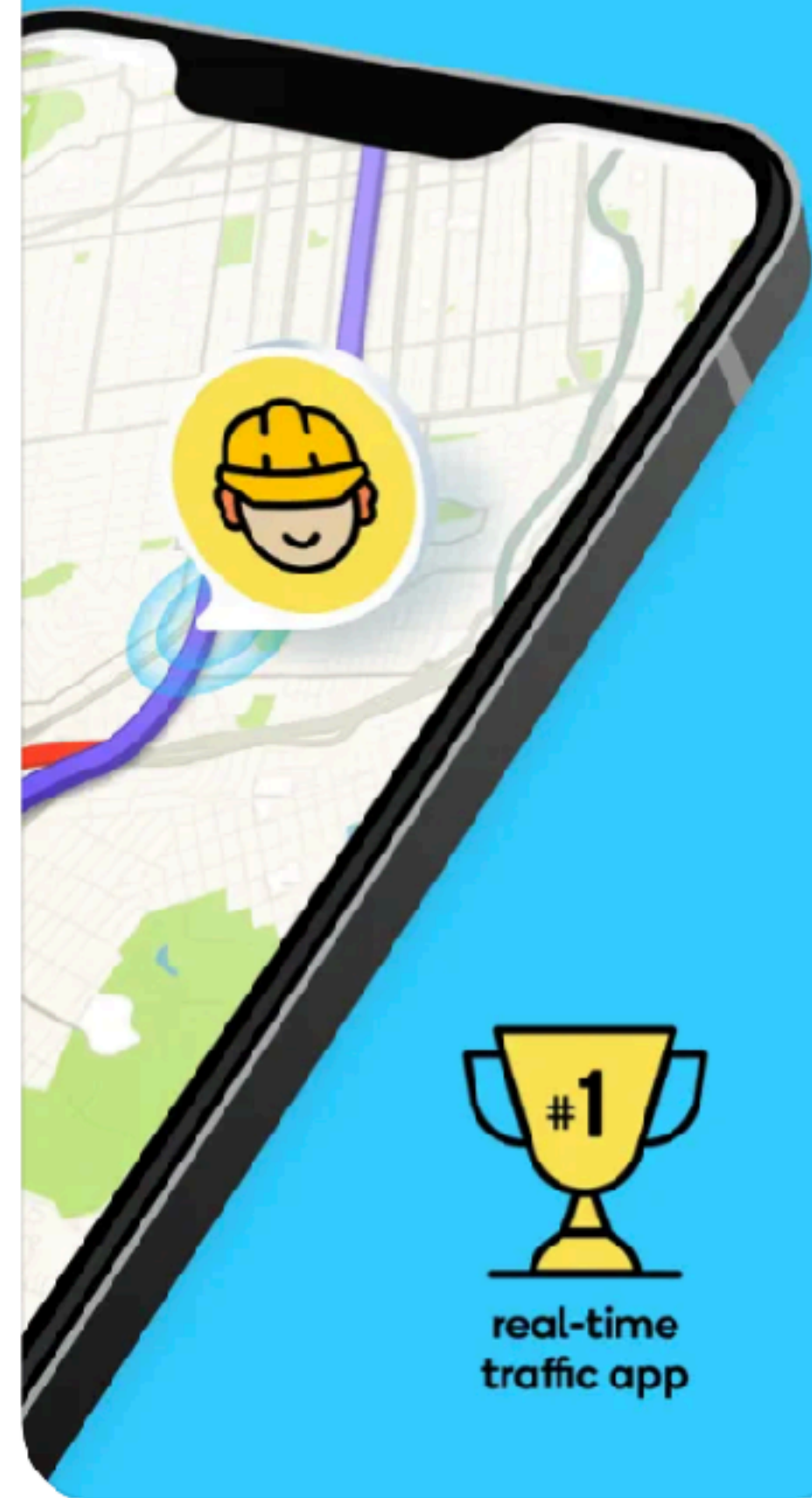
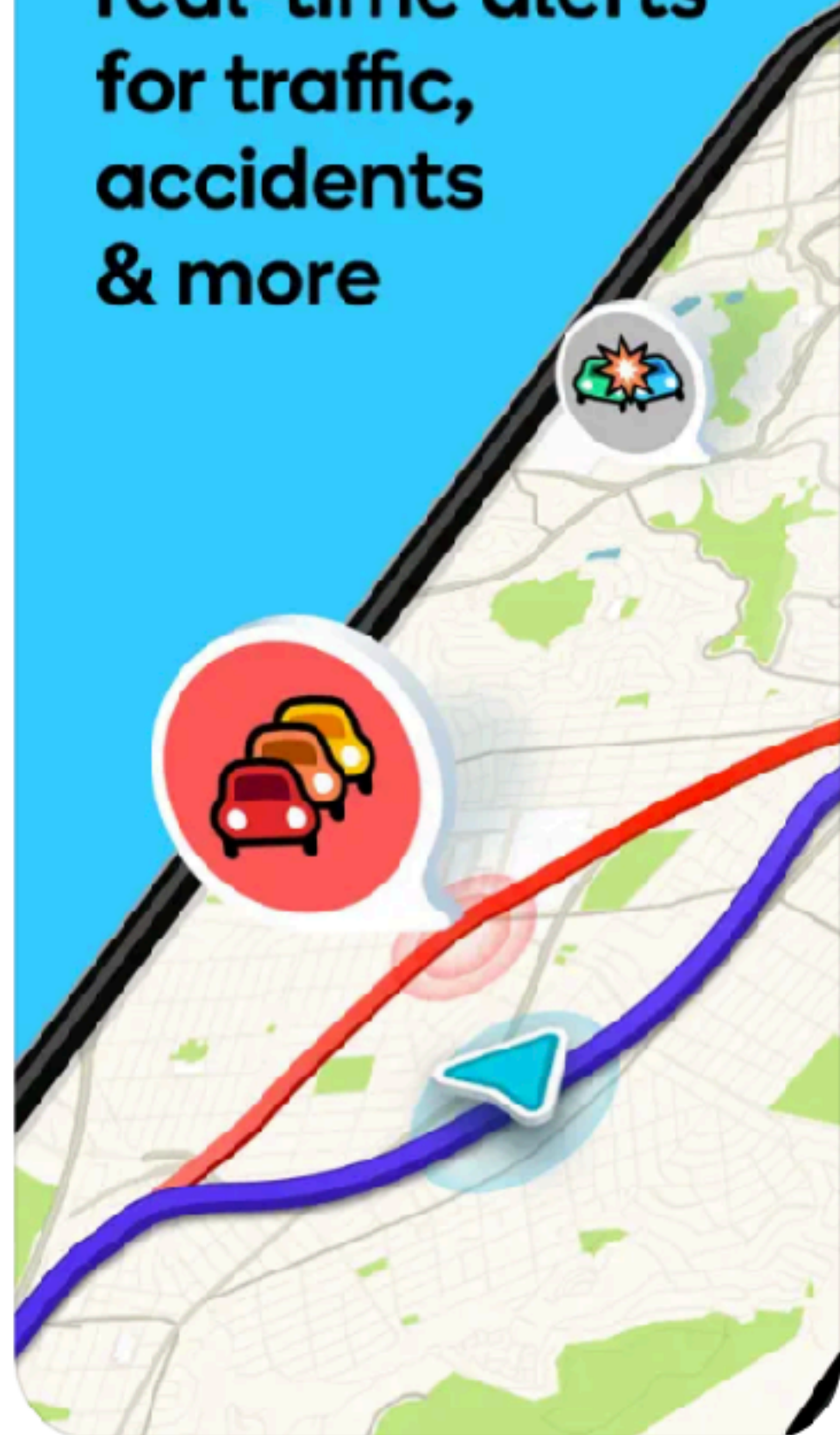
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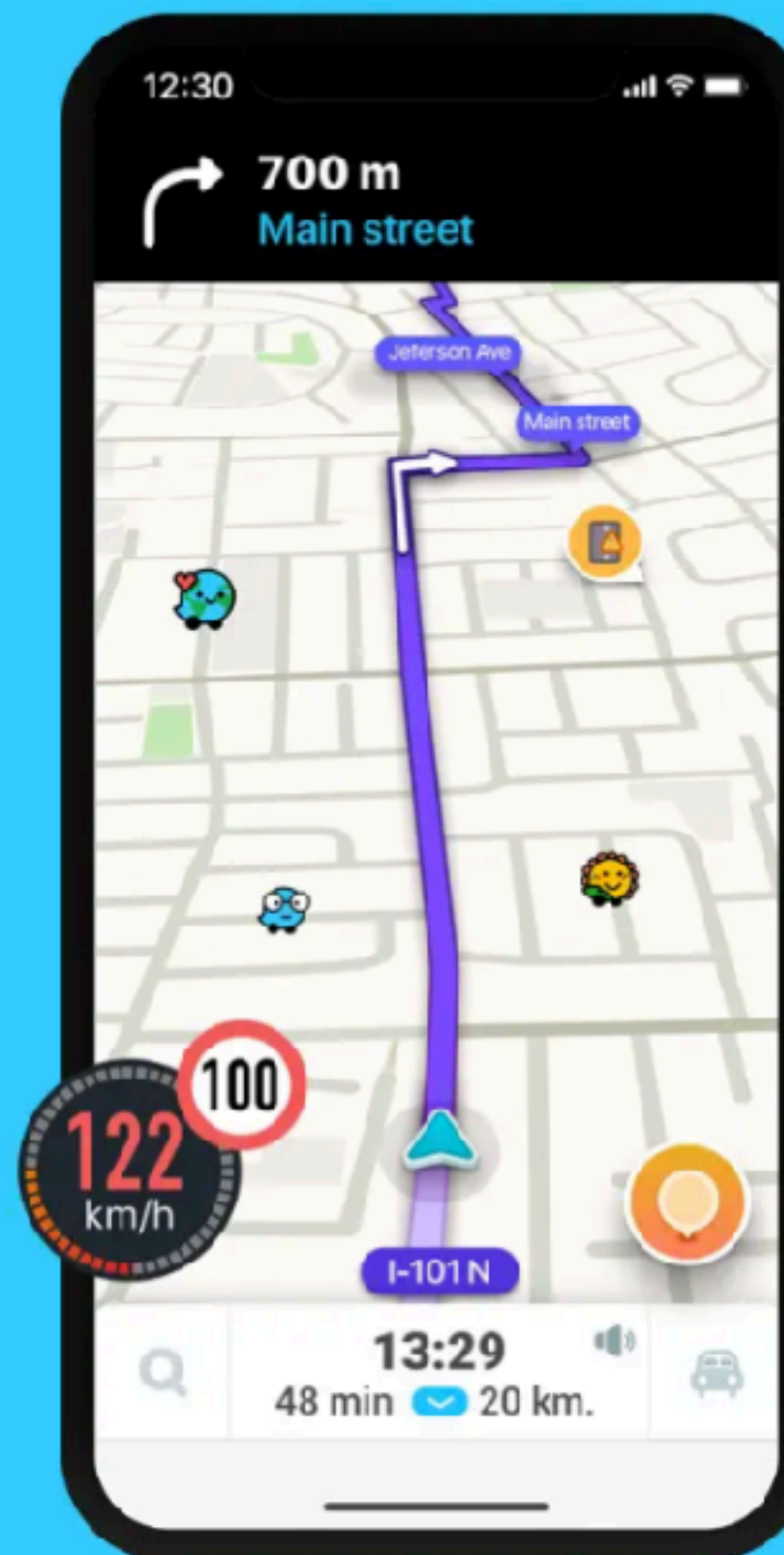
Indirect Stakeholders: The Waze Effect



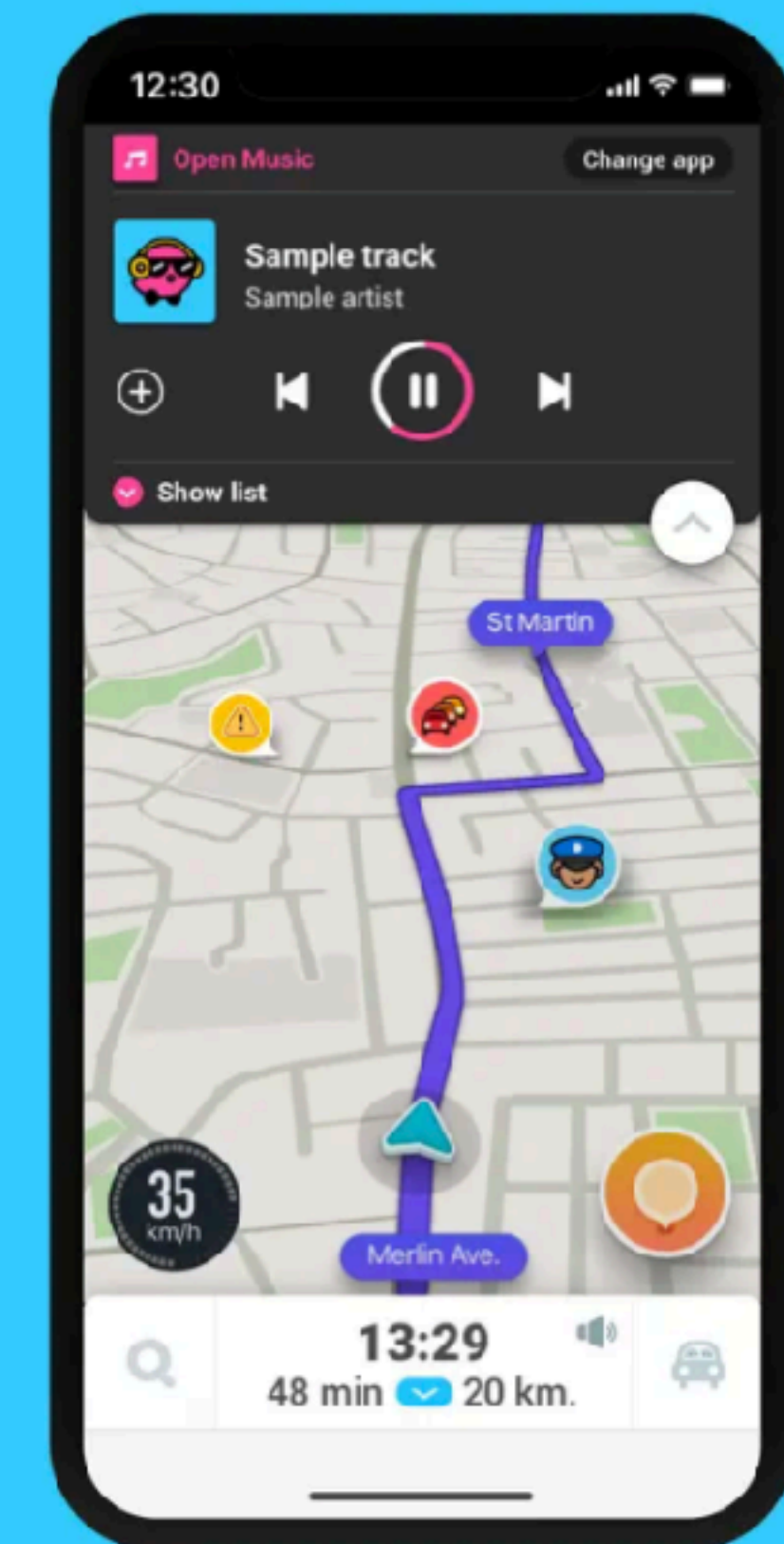
Get the best routes with real-time alerts for traffic, accidents & more



Avoid unnecessary speeding tickets



Listen to music, podcasts & more



BOROUGH
of
LEONIA
settled
1668

 CBS THIS
MORNING

WAZED AND CONFUSED

NJ TOWN TARGETS CONGESTION FROM NAVIGATION APPS



Indirect Stakeholders: The Waze Effect



WBZ-TV

Gail Barry of Medford says navigation apps have **completely changed her neighborhood.**

"The cars go whiz, whiz, whiz. It's like we are living on a highway. It's horrible."

Traffic on her residential street has gotten worse every year over the past couple of years.

<https://www.cbsnews.com/boston/news/iteam-waze-google-maps-traffic-navigation-apps-commuters/>



Photo by Evelyn Hockstein for The Washington Post

Tim Connor lives on a quiet residential street in Takoma Park, Maryland.

One afternoon, Connor **counted a vehicle every two seconds on a street with a single lane** available between parked cars.

One morning, neighbors **awoke to a cacophony of honks** and went out to find a **backup dozens of cars deep**, two drivers in the middle **about to come to blows.**

https://www.washingtonpost.com/local/traffic-weary-homeowners-and-waze-are-at-war-again-guess-whos-winning/2016/06/05/c466df46-299d-11e6-b989-4e5479715b54_story.html

Indirect Stakeholders: The Waze Effect



Gail Barry of Medford says navigation apps have **completely changed her neighborhood**

1. How could Waze update its design to account for its indirect stakeholders?
2. What could the indirect stakeholders do to fight back?

WBZ-TV



Photo by Evelyn Hockstein for The Washington Post

~3 mins: Discuss in Pairs.

One morning, neighbors **awoke to a cacophony of honks** and went out to find a **backup dozens of cars deep**, two drivers in the middle **about to come to blows**.

https://www.washingtonpost.com/local/traffic-weary-homeowners-and-waze-are-at-war-again-guess-whos-winning/2016/06/05/c466df46-299d-11e6-b989-4e5479715b54_story.html

t's horrible."
ver the past couple

, Maryland.

on a street with a

Indirect Stakeholders: The Waze Effect



DAVID E. RYU
COUNCILMEMBER, FOURTH DISTRICT

April 17, 2018

City Attorney Mike Feuer
Office of the Los Angeles City Attorney
James K. Hahn City Hall East
200 North Main Street, 8th Floor
Los Angeles, CA 90012

Dear City Attorney,

I am writing you today to urge your office to explore filing suit against Waze, owned by Google LLC, a subsidiary of Alphabet, for creating a dangerous condition in the public right of way. After numerous attempts to reach a resolution with Waze for the threats to public safety and infrastructure caused by their mobile technology, it has become clear that any and all legal options should be considered.

Wayfinding technology such as Waze has grown increasingly popular with drivers. In 2015, Waze reported that it had about 2 million users in Greater Los Angeles, one of the app's most popular locations. This new kind of wayfinding technology promises users a faster commute by giving real-time traffic updates and alternate routes to traditional arteries. To achieve this, it can wreak undue havoc on traffic plans, residential communities, and the safety of the residents of Los Angeles. Ironically, many of these "short cuts", end up causing more traffic in a race-to-the-bottom effort to cut travel times by using small cut-through streets, leading drivers to make unsafe turns and often unpermitted traffic directions.

Indirect Stakeholders: The Waze Effect



"All roads are the public domain and therefore the right of everyone to use [...] In that sense, Waze redistributes traffic to create a better traffic situation for everyone."

– Uri Levine, Waze Co-Founder

Variation in Human Ability: Designing for Accessibility



Liz Jackson

@elizejackson



Disability Dongle: A well intended elegant, yet useless solution to a problem we never knew we had. Disability Dongles are most often conceived of and created in design schools and at IDEO.

3:49 PM · Mar 26, 2019 · Twitter Web Client

90 Retweets **17** Quote Tweets **366** Likes



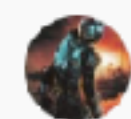
Mashable 
@mashable



These students just blew minds with their wheelchair prototype

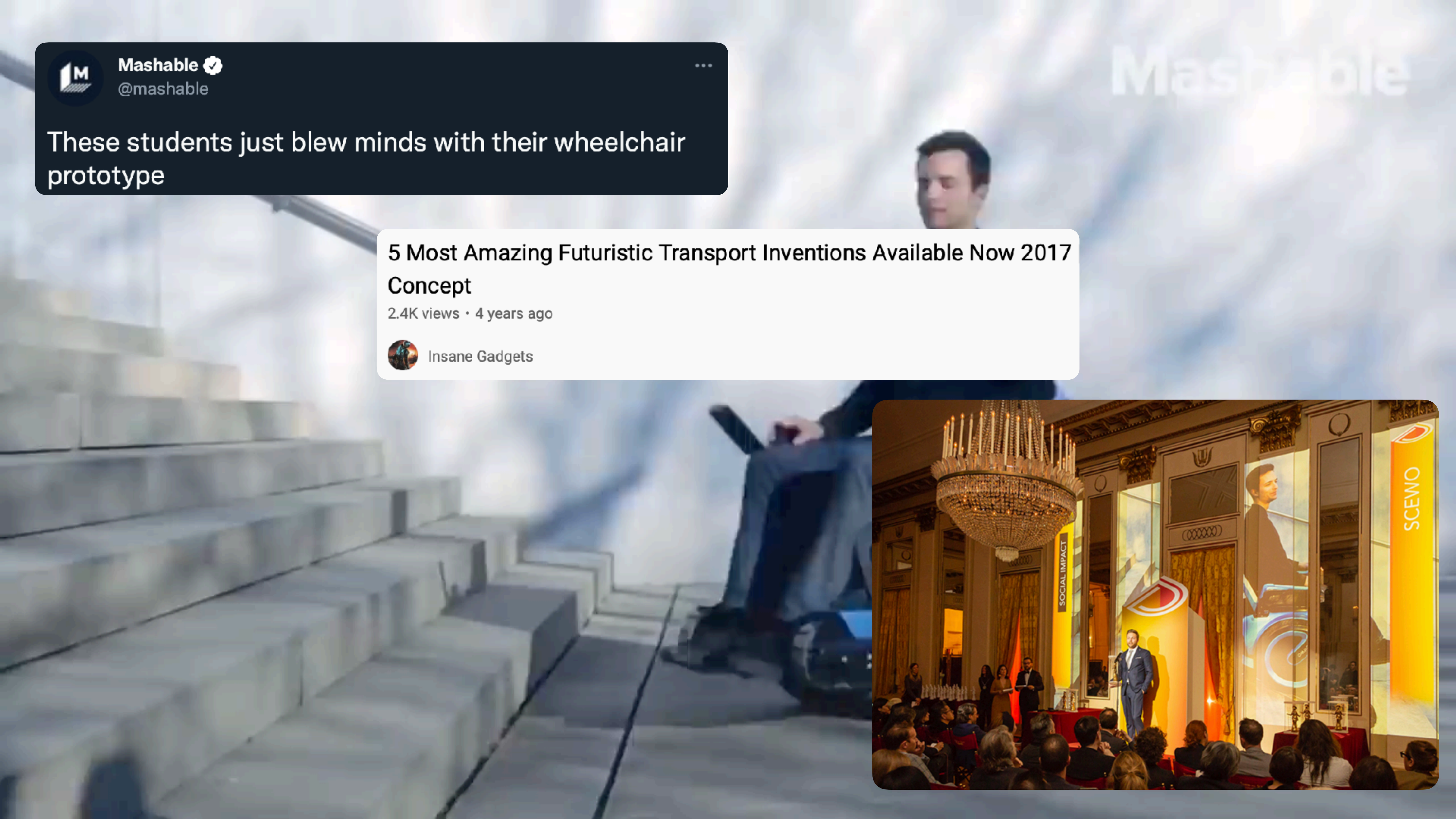
5 Most Amazing Futuristic Transport Inventions Available Now 2017 Concept

2.4K views · 4 years ago



Insane Gadgets

Mashable





Manual chairs are far too expensive for those that need them to afford, so who knows how anyone who isn't a billionaire is supposed to afford these glorified (and ugly) segways?

2 2 6



I'd for sure fall out going up backwards. My core strength to hold myself upright is rubbish, no way I'd be able to do that. Also, going upstairs backwards in a crowd seems like it would be.... challenging at best

2 3



If it takes my HMO six weeks to approve new tires for my manual wheelchair, there isn't a chance in hell that they're approving one of these 'fancy' chairs

1 1 10



"What's the market price, what's the lifespan of the rubberized tracks, what's the maintenance model, what's the functionality of the chair if it stops working suddenly, what's the charge-cycle of the batteries, what's the lifespan of the batteries?"

"But it looks cool!"

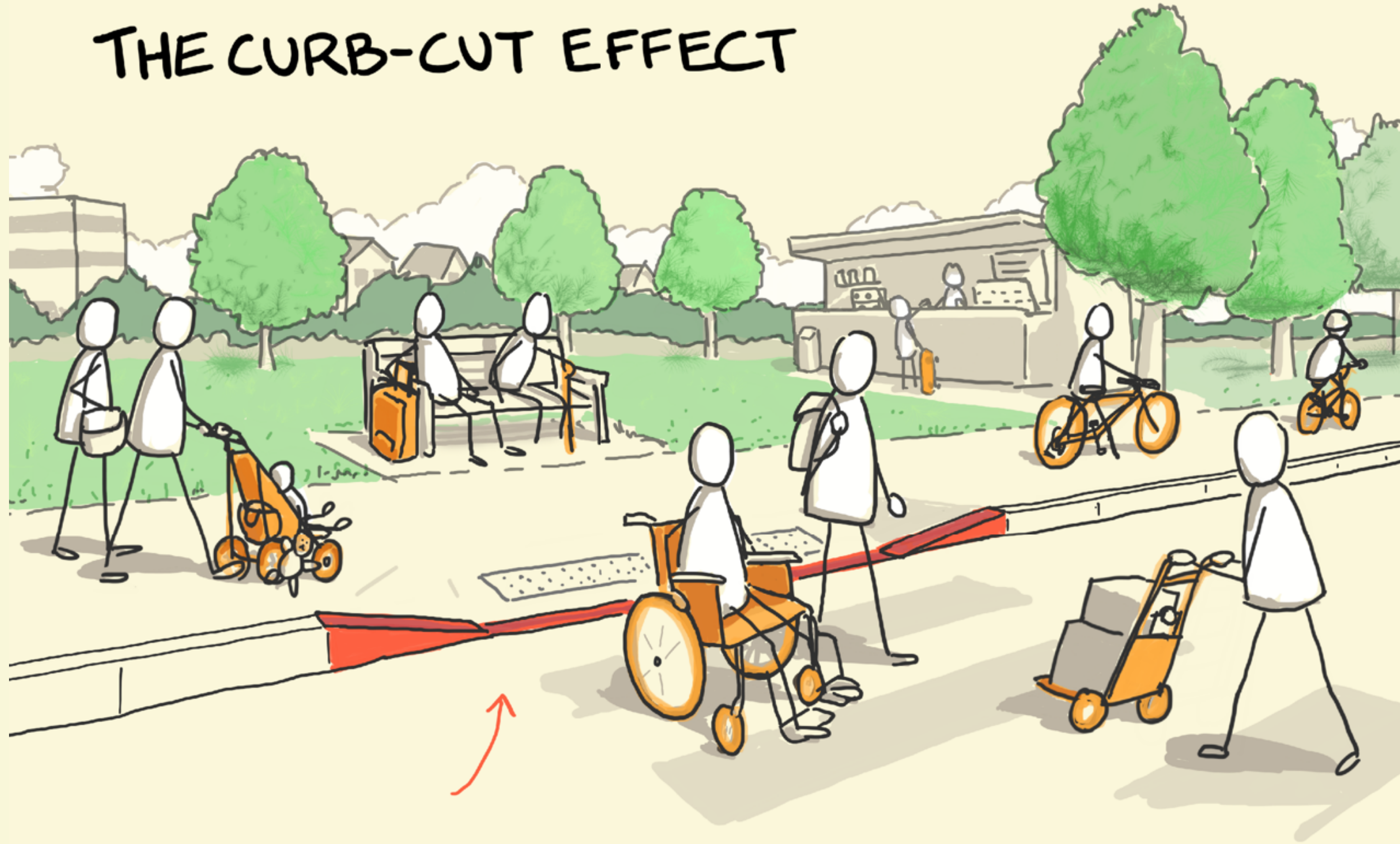
1 5



Looks expensive. A simple ramp would be accessible to people who cannot afford this kind of tech as well as those with other mobility restrictions.

1 1 6

THE CURB-CUT EFFECT



WHEN WE DESIGN
FOR DISABILITIES

... WE MAKE THINGS
BETTER FOR EVERYONE

sketchplanations

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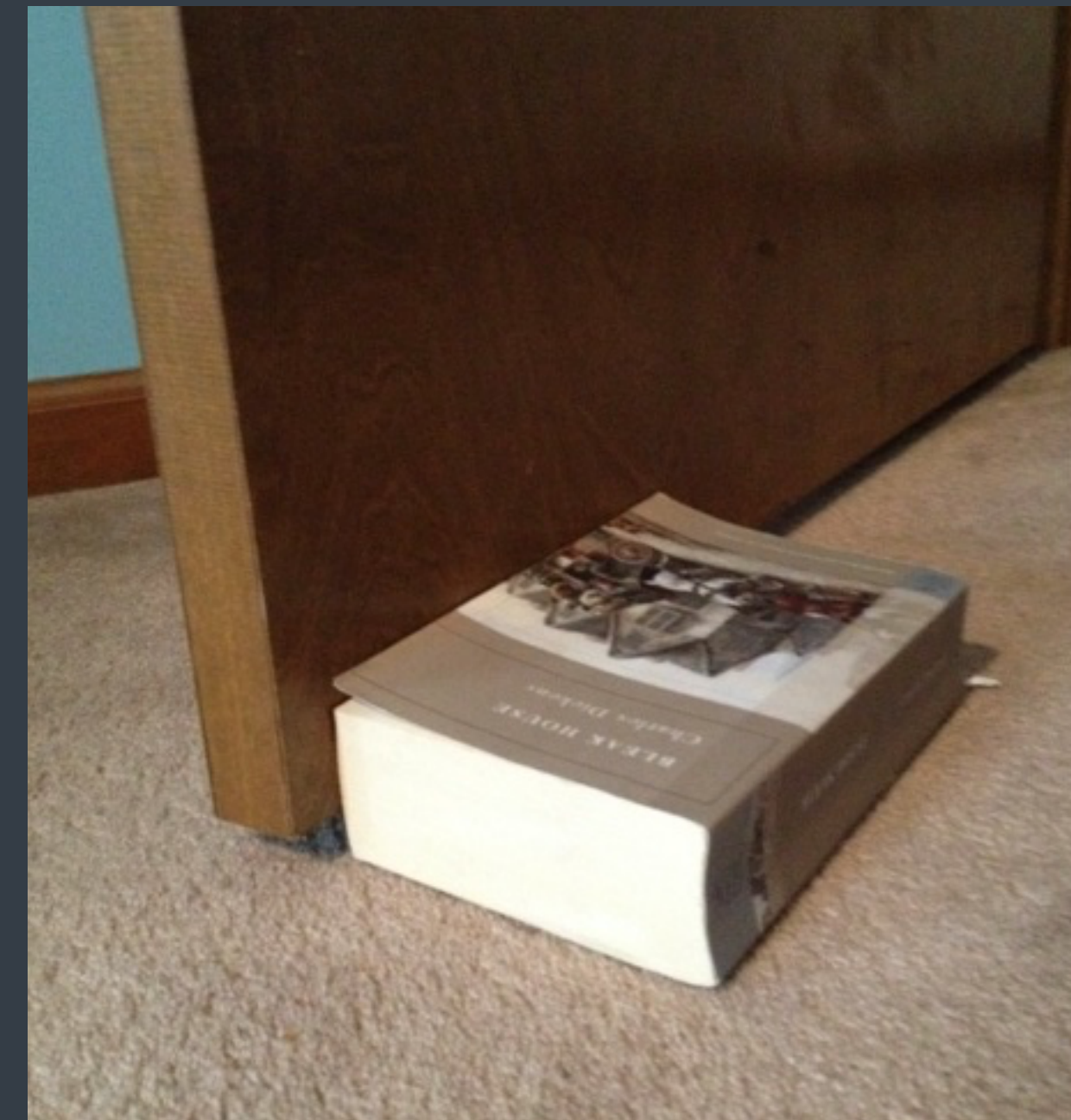
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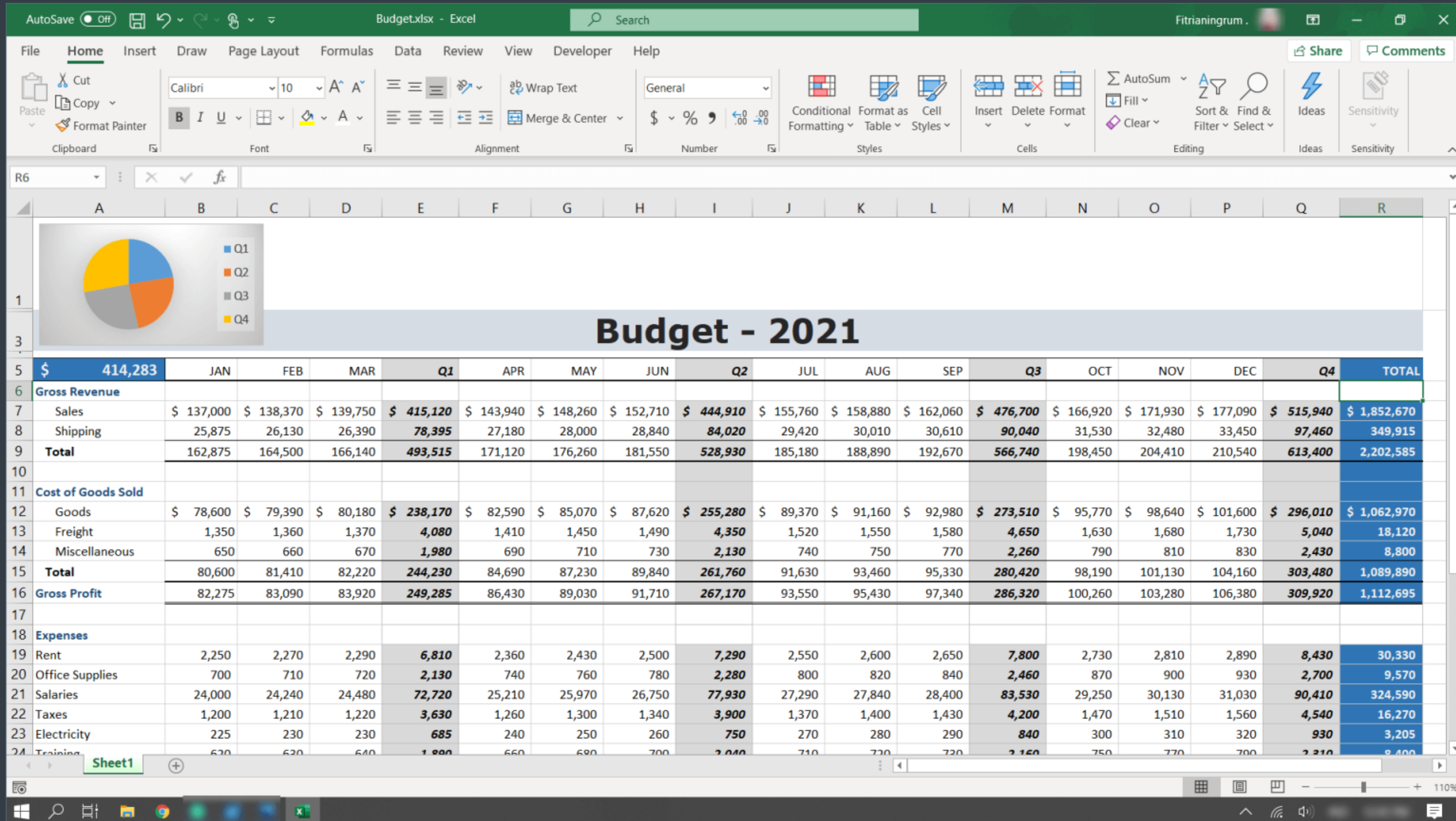
Reappropriation



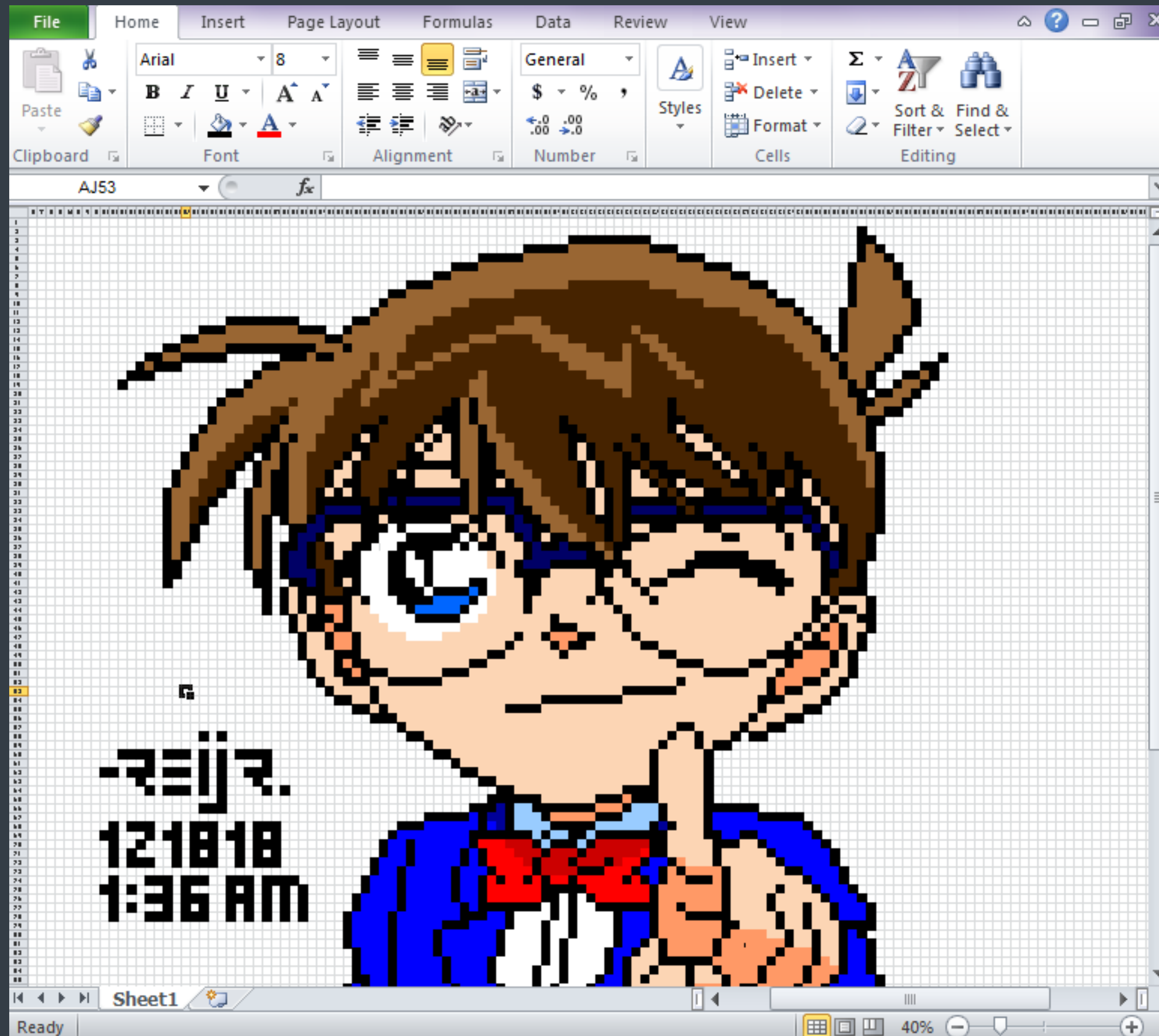
Photo by Clément Gault



Reappropriation: Malleable Software

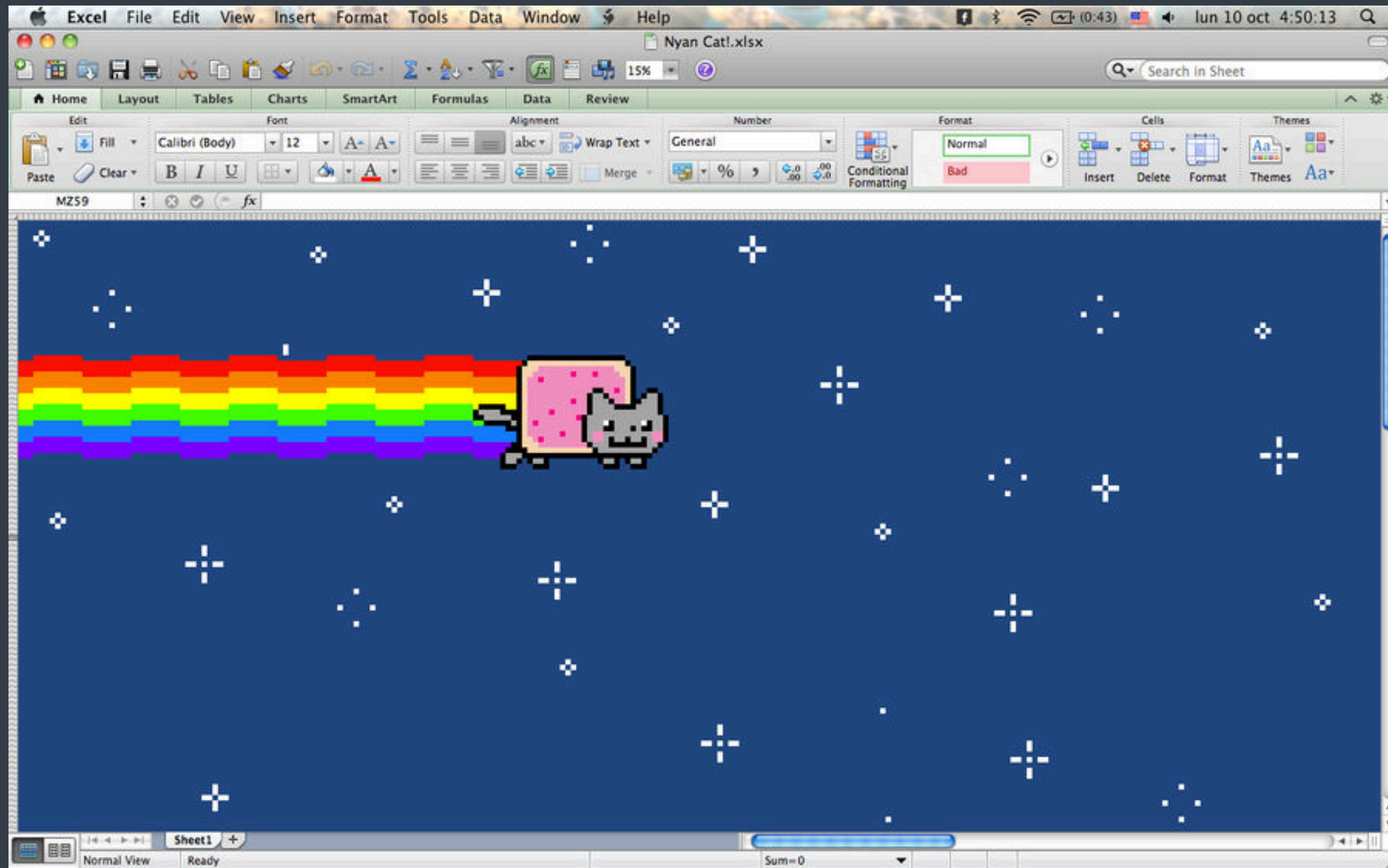


Reappropriation: Malleable Software



Pixel art by [reijr.](#)
Curated by [Maggie Appleton](#)

Reappropriation: Malleable Software



Pixel art by [Oscarito7](#).
Curated by [Maggie Appleton](#)

Reappropriation: Malleable Software

[Template] 5E D&D Character Sheet (Tintagel) v2.92

File Edit View Insert Format Data Tools Extensions Help

100% View only

A1 fx

1	John Doe		1	Human				
2	Character Name		Level	Race	Gender	Alignment	Deity	
3								
4	Size	Hair	Eyes	Height	Weight	Age	Background	
5								

DUNGEONS & DRAGONS

CORE INFORMATION

ABILITY SCORES			SAVING THROWS			CLASSES					XP	Portrait
STR	16	+3	STR	+3		Class Name	Lvl	Hit Dice	Con	HP	0	
DEX	10	+0	DEX	+2	•	Cleric	1	1d8	1	8	+0	
CON	13	+1	CON	+1								
INT	12	+1	INT	+3	•							
WIS	8	-1	WIS	-1								
CHA	14	+2	CHA	+2								
						Total:	1			9		

Mod Prof Misc

Move 30 Enc 20 Other Modes

SKILLS

Roll	Skill	Prof	Adv
+0	Acrobatics (Dex)		
-1	Animal Handling (Wis)		
+1	Arcana (Int)		
+3	Athletics (Str)		
+2	Deception (Cha)		
+1	History (Int)		
-1	Insight (Wis)		
+2	Intimidation (Cha)		
+1	Investigation (Int)		

COMBAT

Hit Points	AC	Armor	Dex	Armor Worn	Type	AC	Dex	DA	Wt.
9 / 9	10	10	+0	None	L	10	-0		0
		Misc 1	Misc 2	No shield					
				Total:		10	-0		0

Downtime or other metric

Hit Dice 1d8+1 (x1)

Death Saves
Success
Failure

Ammunition
Arrows

Weapon & Spells	Hit	#Atk	Damage	Rng	Type	Notes

README Front Back Spell Sheet Master Spell List Variations

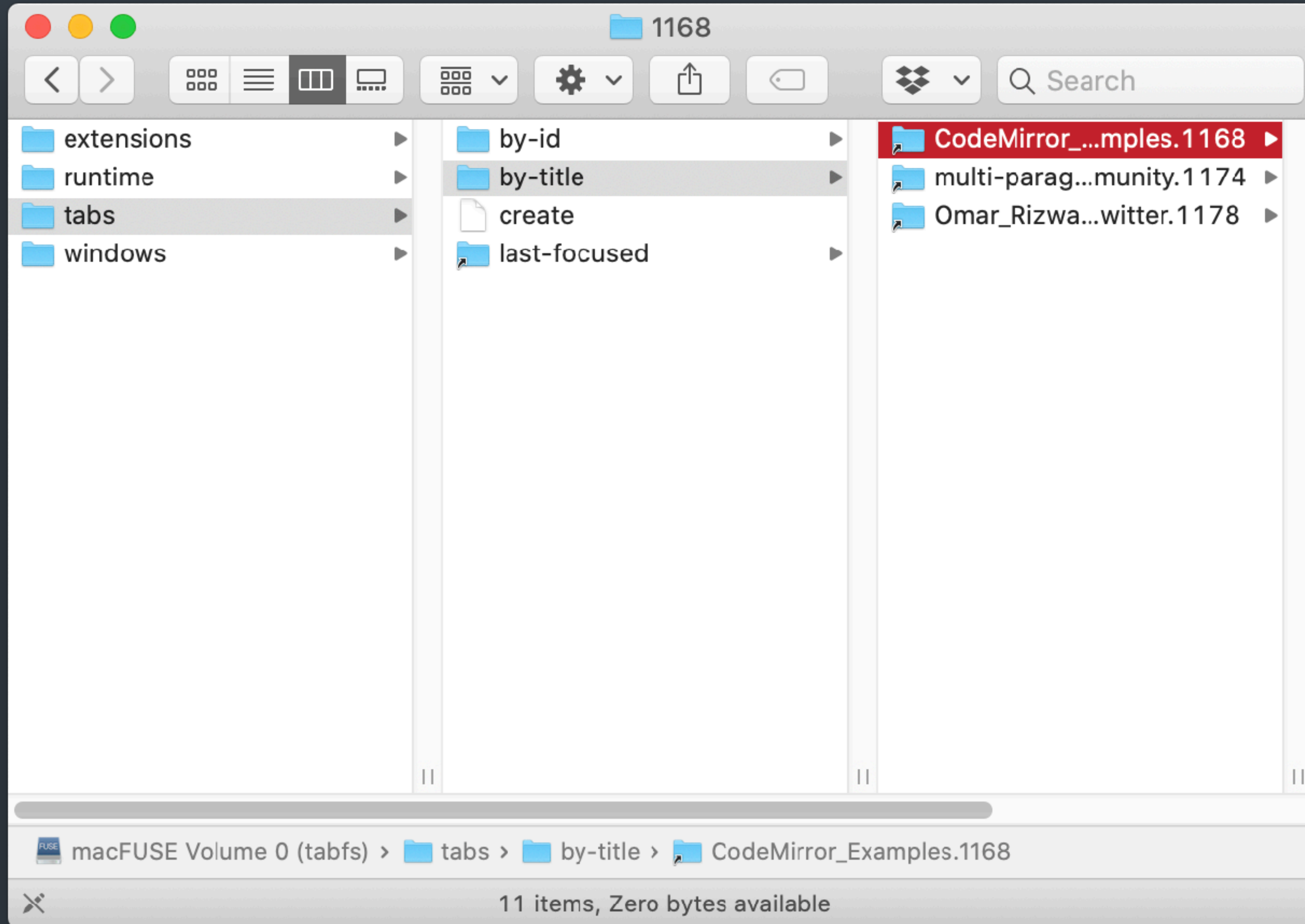
Reappropriation: Malleable Software

The screenshot displays the X1Studio v1 interface, designed by Dylan Tallchief. At the top, the title 'X1Studio' is prominently featured in a stylized orange font, with 'v1 by Dylan Tallchief' and a 'Click Here!' button below it. The main workspace is a piano roll grid. On the left, a control panel includes a table of settings:

BPM	:	169
Device	:	1
Legato	:	Off
Swing	:	0

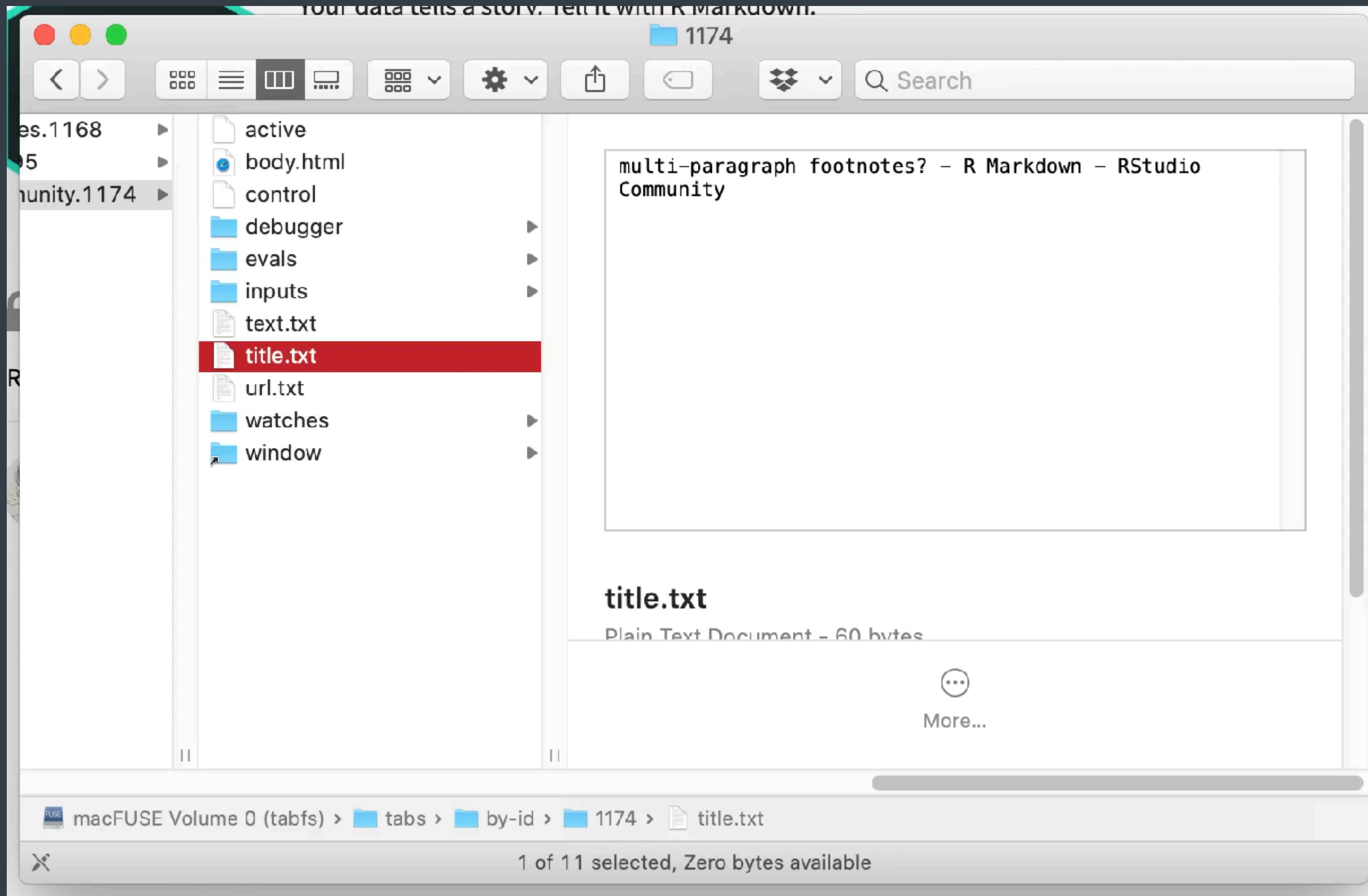
Below the settings are four buttons: 'Play' (yellow), 'Add Track' (green), 'Remove Track' (orange), and 'Export' (blue). The piano roll shows a timeline with segments for 'Intro', 'Hook', and 'Verse 1'. Multiple tracks are visible, including Drums, Synth, Bass, Slow Strings, Lead, Lead 2, and Strings 2, each with a unique color and a sequence of notes or rests represented by numbers and dots.

Reappropriation: TabFS by Omar Rizwan



<https://omar.website/tabfs/>

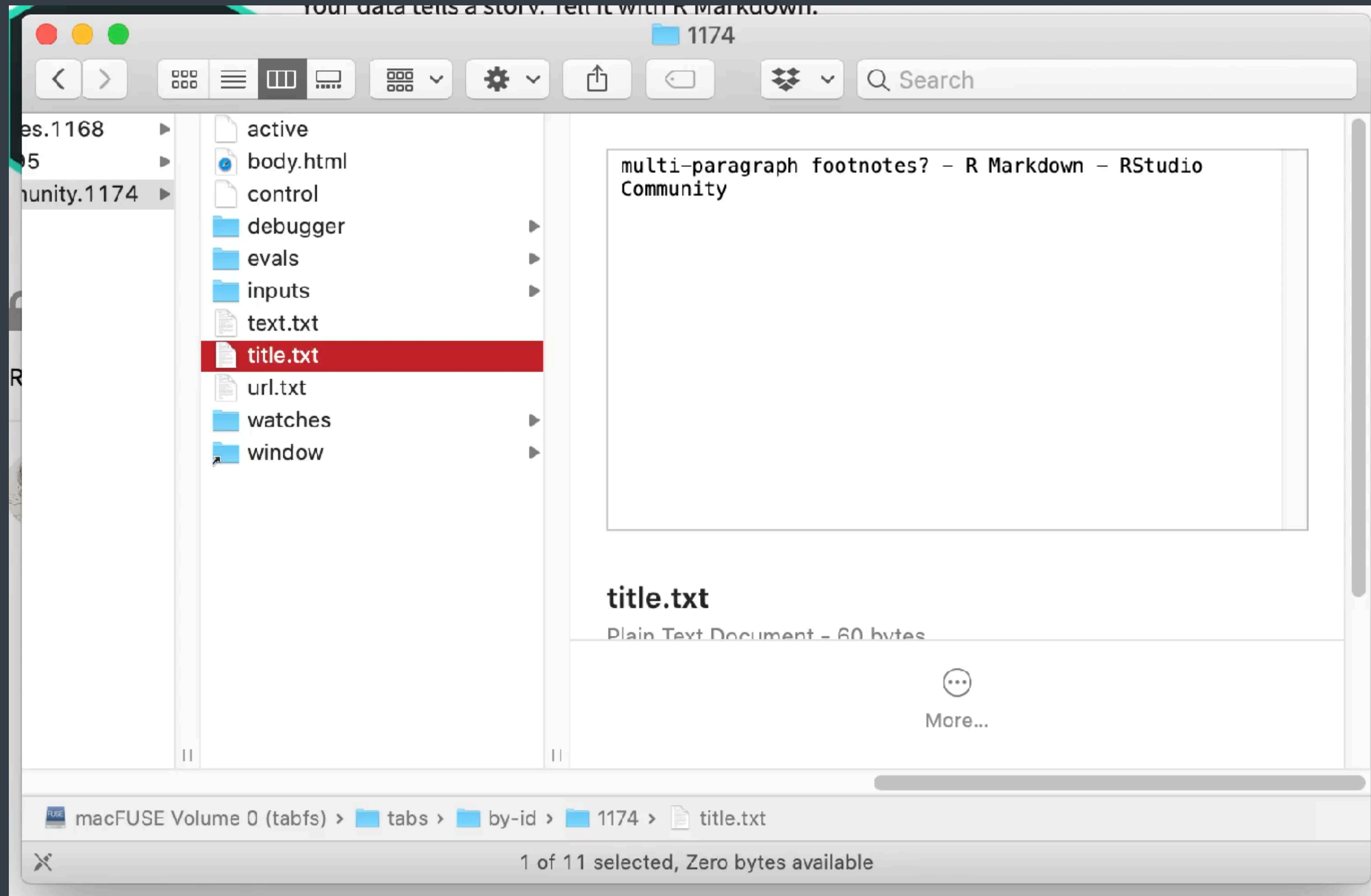
Reappropriation: TabFS by Omar Rizwan



What can you envision doing now that tabs are just files and folders?

~3 mins: Pair Discussion.

Reappropriation: TabFS by Omar Rizwan

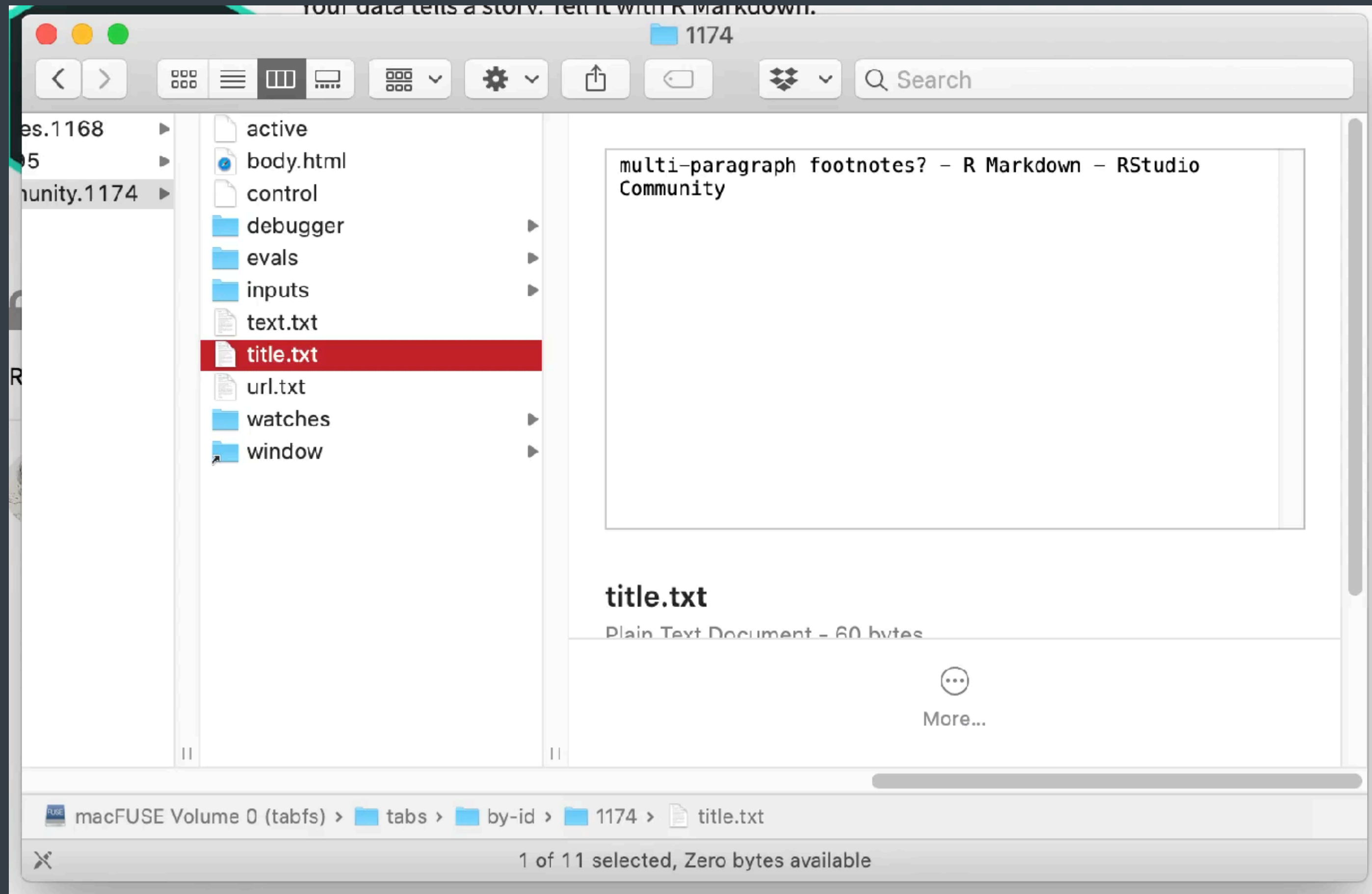


List titles of all open tabs:

```
$ cat mnt/tabs/by-id/*/title.txt  
GitHub  
Home / Twitter  
61040 Discourse
```

<https://omar.website/tabfs/>

Reappropriation: TabFS by Omar Rizwan

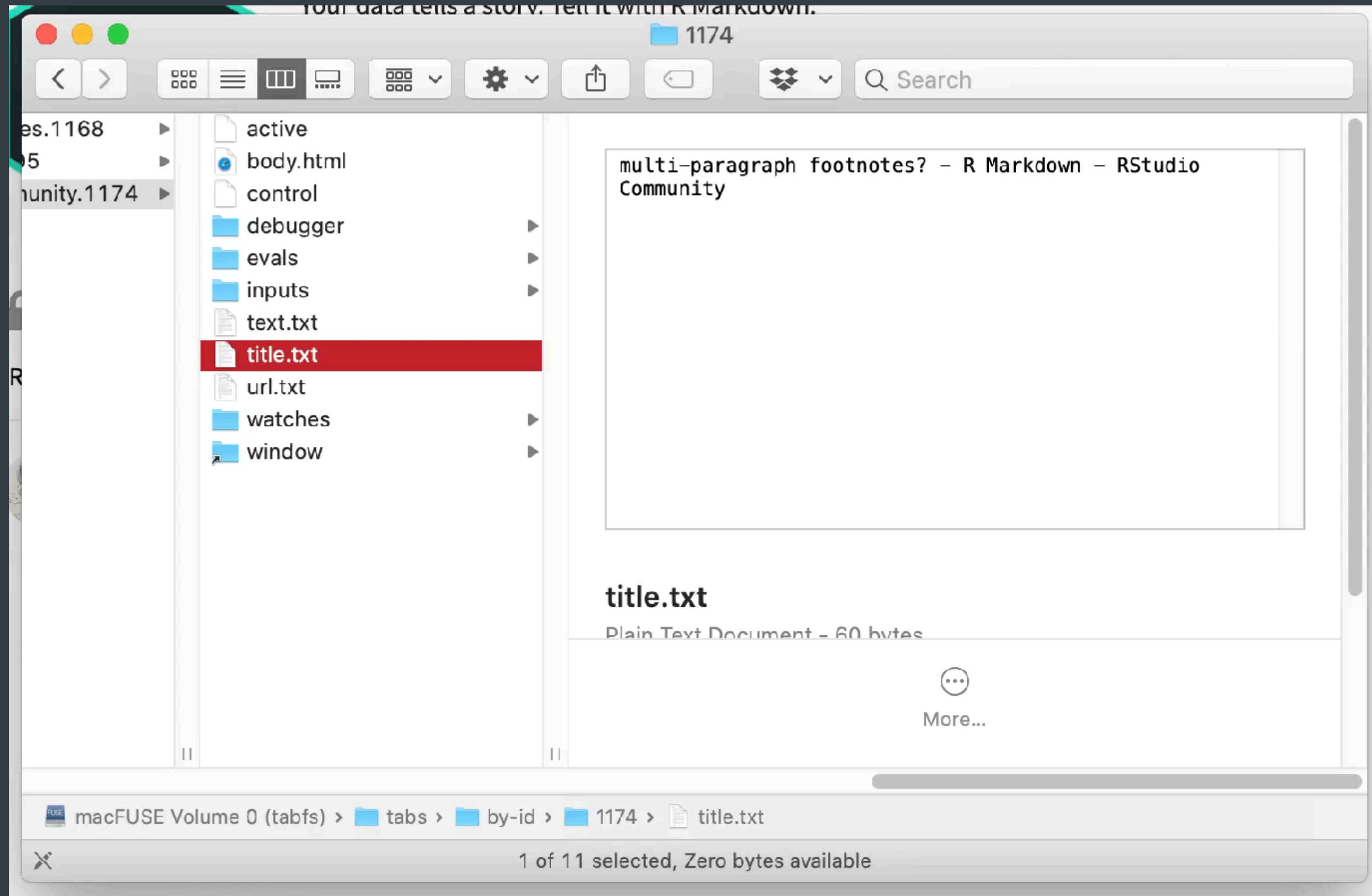


Close all Stack Overflow tabs:

```
$ rm mnt/tabs/by-title/*Stack_Overflow*
```

<https://omar.website/tabfs/>

Reappropriation: TabFS by Omar Rizwan



Live edit body.html in your favourite code editor

<https://omar.website/tabfs/>

Choosing Not to Use

15 WMTV MADISON nbc15.com THE CW
73° Madison, WI

First Alert Weather Navigating School NBC15 Investigates Coronavirus News

Madison Common Council passes ordinance banning facial recognition technology

The New York Times

San Francisco Bans Facial Recognition Technology

Give this article 360

By [Kate Conger](#), [Richard Fausset](#) and [Serge F. Kovaleski](#)
May 14, 2019

wbur LOCAL COVERAGE LISTEN LIVE DONATE

Home // Local Coverage

Brookline Passes Ban On Municipal Use Of Facial Recognition Tech

December 12, 2019 By [Laney Ruckstuhl](#)

wbur LOCAL COVERAGE LISTEN LIVE DONATE

Home // Local Coverage

Boston Bans Use Of Facial Recognition Technology. It's The 2nd-Largest City To Do So

Updated June 24, 2020 By [Ally Jarmanning](#)

BOSTON.COM

Cambridge becomes the largest Massachusetts city to ban facial recognition

"Massachusetts cities and towns are stepping up to ensure that face surveillance technology doesn't get out ahead of our basic rights."

CNN BUSINESS Audio Live TV Log In

Portland passes broadest facial recognition ban in the US

By [Rachel Metz](#), [CNN Business](#)
Updated 8:06 PM ET, Wed September 9, 2020

Choosing Not to Use: Face Recognition



[About](#) [Issues](#) [Our Work](#) [Take Action](#) [Tools](#) [Donate](#) [Q](#)

Resisting the Menace of Face Recognition

BY [ADAM SCHWARTZ](#) | OCTOBER 26, 2021

[ESPAÑOL](#)

Face recognition technology is a special menace to privacy, racial justice, free expression, and information security. Our faces are unique identifiers, and most of us expose them everywhere we go. And unlike our passwords and identification numbers, we can't get a new face. So, governments and businesses, often working in partnership, are increasingly using our faces to track our whereabouts, activities, and associations.

Choosing Not to Use: Face Recognition

The screenshot shows the Facebook interface with the 'Who's in These Photos?' section. The header includes the Facebook logo, a search bar, and navigation links for Home, Profile, and Account. The main content area is titled 'Who's in These Photos?' and contains a sub-header: 'The photos you uploaded were grouped automatically so you can quickly label and notify friends in these pictures. (Friends can always untag themselves.)' Below this, there are six photo thumbnails arranged in two rows of three. The first row shows three photos with white boxes highlighting faces. Below each photo in the first row is a tag: 'AJ [blurred]', 'Jennifer [blurred]', and 'Jamie [blurred]'. The second row shows three photos with white boxes highlighting faces, each with a 'Who is this?' label below it. At the bottom of the section, there are three buttons: 'Skip Tagging Friends', 'Save Tags', and 'Chat (Offline)'.

Choosing Not to Use: Face Recognition

General
Security and Login

Privacy
Timeline and Taggi...
Blocking
Language
Face Recognition

Notifications
Mobile
Public Posts

Apps
Ads
Payments
Support Inbox
Videos

Face Recognition Settings

To recognize whether you're in a photo or video our system compares it with your profile picture, and photos and videos that you're tagged in. This lets us know when you're in other photos and videos so we can create better experiences. [Learn more.](#)

Face Recognition	Do you want Facebook to be able to recognize you in photos and videos?	No	Edit
------------------	--	----	------

But lots of open design questions:


- Does this setting control whether or not "face templates" are computed? Or only how they're used (e.g., automatic suggestions)?
- When should a "face template" be computed? When a photo is uploaded? Someone is tagged? Someone agrees to be tagged?
- If permission is revoked, should old "face templates" be deleted?

Choosing Not to Use: Face Recognition

The New York Times

Facebook to Pay \$550 Million to Settle Facial Recognition Suit

It was another black mark on the privacy record of the social network, which also reported its quarterly earnings.

 Give this article



By [Natasha Singer](#) and [Mike Isaac](#)

Jan. 29, 2020


 Meta

[Who We Are](#)

[What We Build](#)

[Our Actions](#)

[Our Community](#)

 [Back to Newsroom](#)

[Facebook](#)

An Update On Our Use of Face Recognition

November 2, 2021

By Jerome Pesenti, VP of Artificial Intelligence

- We're shutting down the Face Recognition system on Facebook. People who've opted in will no longer be automatically recognized in photos and videos and we will delete more than a billion people's individual facial recognition templates.
- This change will also impact Automatic Alt Text (AAT), which creates image descriptions for blind and visually-impaired people. After this change, AAT descriptions will no longer include the names of people recognized in photos but will function normally otherwise.
- We need to weigh the positive use cases for facial recognition against growing societal concerns, especially as regulators have yet to provide clear rules.

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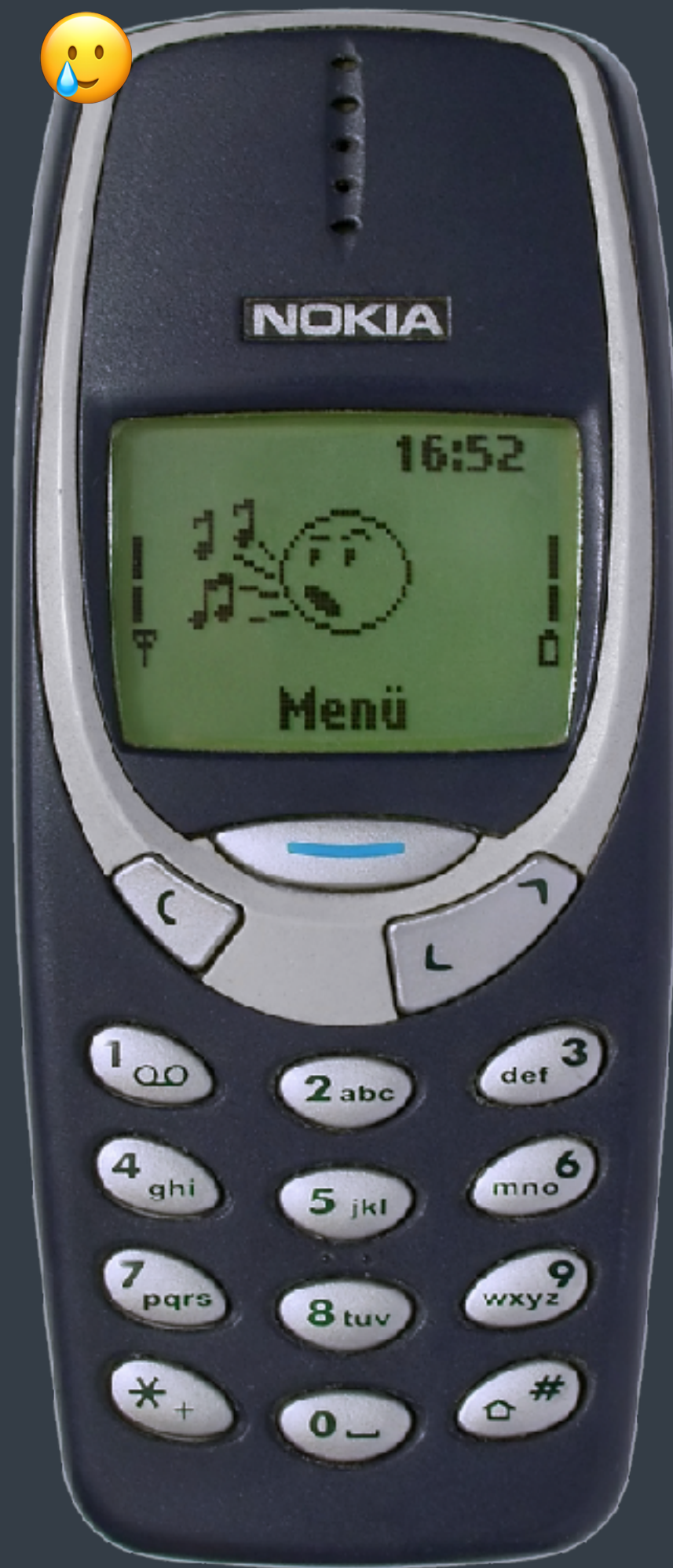
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Widespread Use: Text Autocomplete



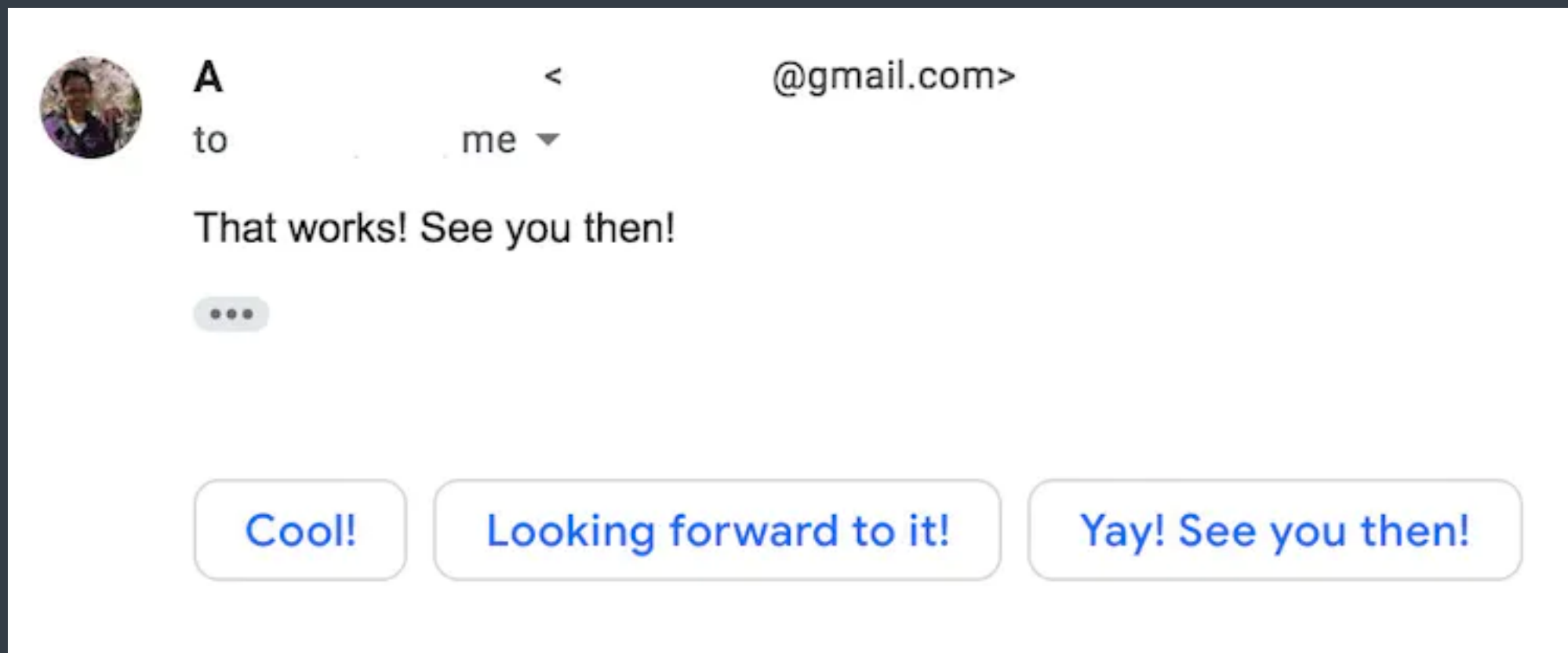
By The Digital Owl.



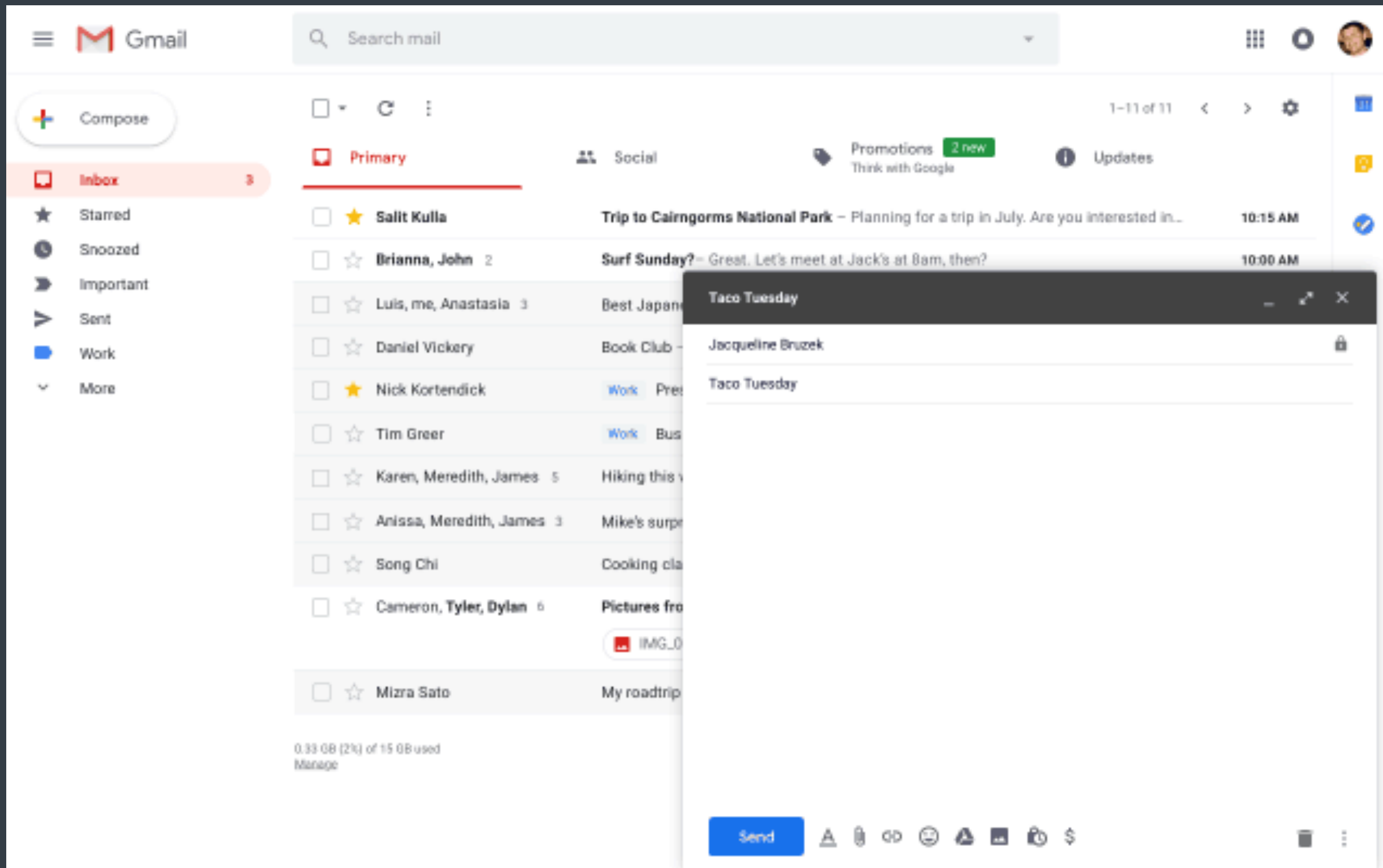
From Engadget

By smial (talk) at English Wikipedia.

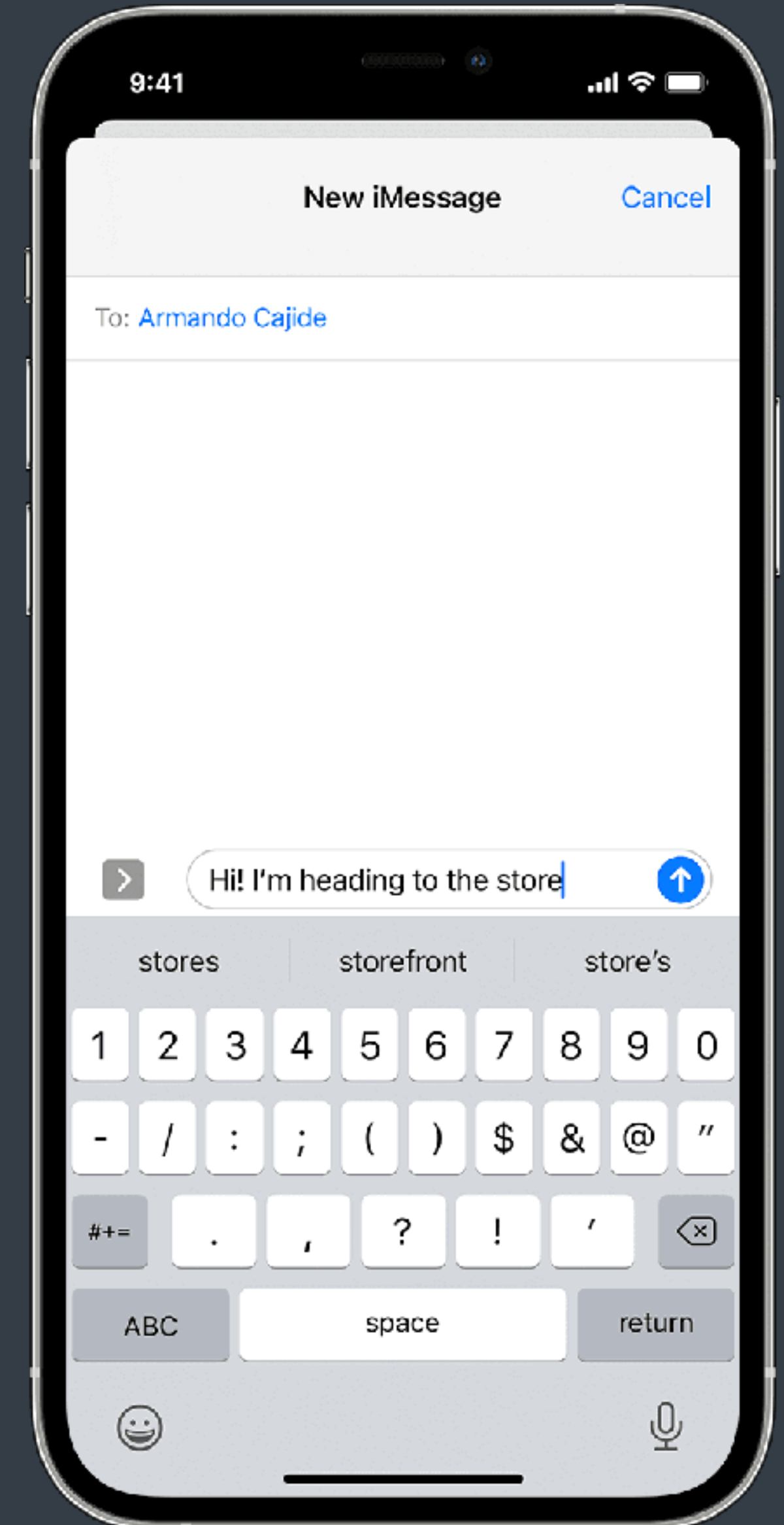
Smart Reply



Smart Compose




Predictive Text



Widespread Use: Text Autocomplete

← Tweet

 Gmail 
@gmail

To all the characters out there 🧑🤖🧙👩: Smart Compose saves Gmail users from typing over 2 billion characters every week. Learn more in Sundar Pichai's Founders' letter → goo.gle/2x3FdIZ



Smart Compose helps save users from typing **over 2B characters** each week

GIF

1:11 PM · Jun 20, 2019 · Sprinklr

22 Retweets 4 Quote Tweets 114 Likes

Paradox:

- Making it easier to send emails → increases overall number of emails people send!
- Making it easier to send emails → changes social norms/expectations → pressure to be responsive

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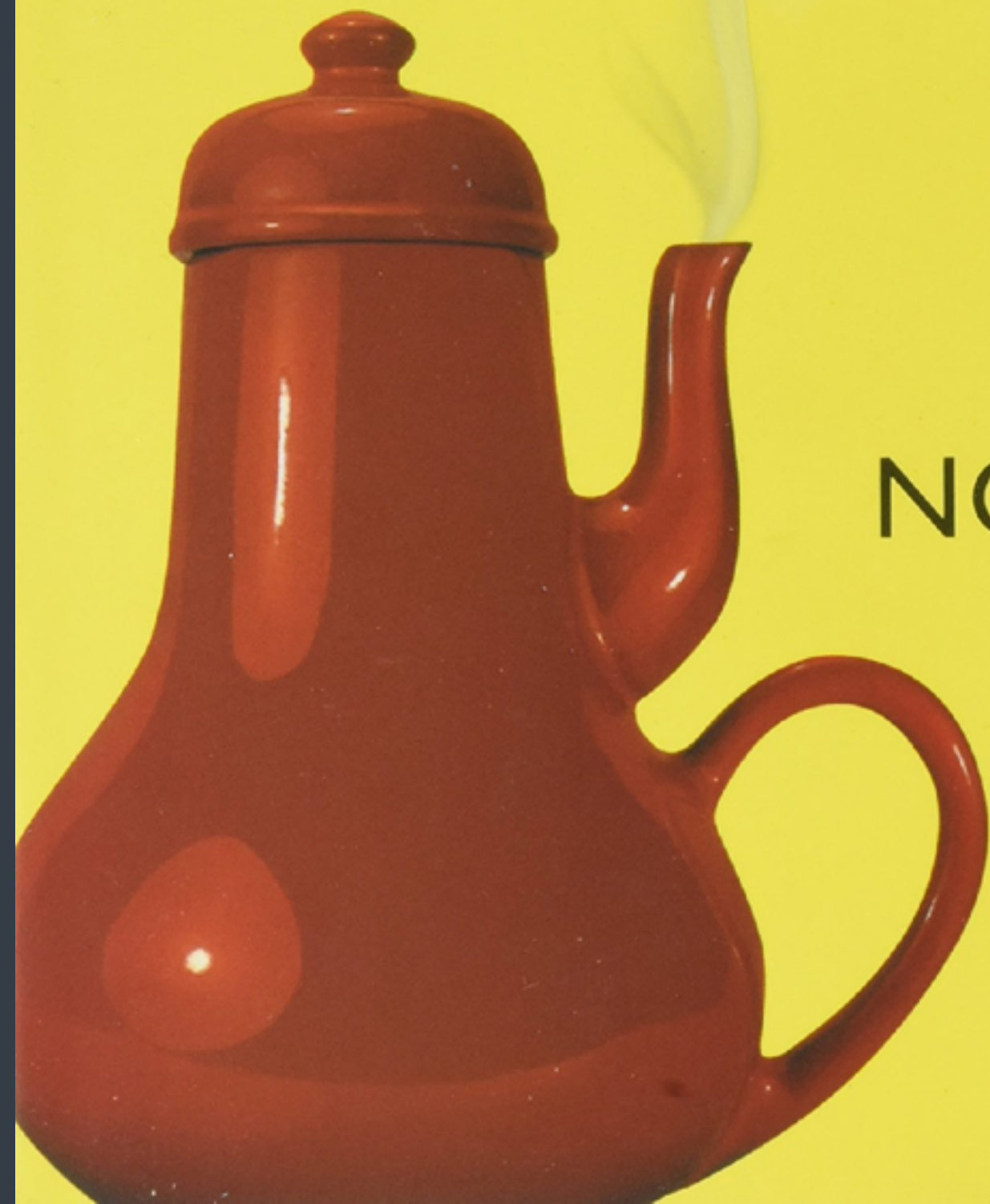
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REVISED & EXPANDED EDITION

The DESIGN *of* EVERYDAY THINGS



DON
NORMAN



Designers are asked to figure out how to manage the interaction of technology and people. Good designers are quick learners, for today they might be asked to design a camera; tomorrow, to design a transportation system or a company's organizational structure. How can one person work across so many different domains? Because the fundamental principles of designing for people are the same across all domains. People are the same, and so the design principles are the same.

Designers are only one part of the complex chain of processes and different professions involved in producing a product. Although

SIX: *Design Thinking* 239

Photo from J. Nathan Matias (@natematias)

Software is *not neutral*

Developing software involves a series of **design choices and tradeoffs**, large and small.

Each design decision is **implicitly encoding your values and priorities**.

Through adoption, those values are then **applied at scale**.

Those design choices then begin to **shape our values**.



Poster by Alvy Brooks (@alvybrooks)



Photo from Sam Altman (@sama)

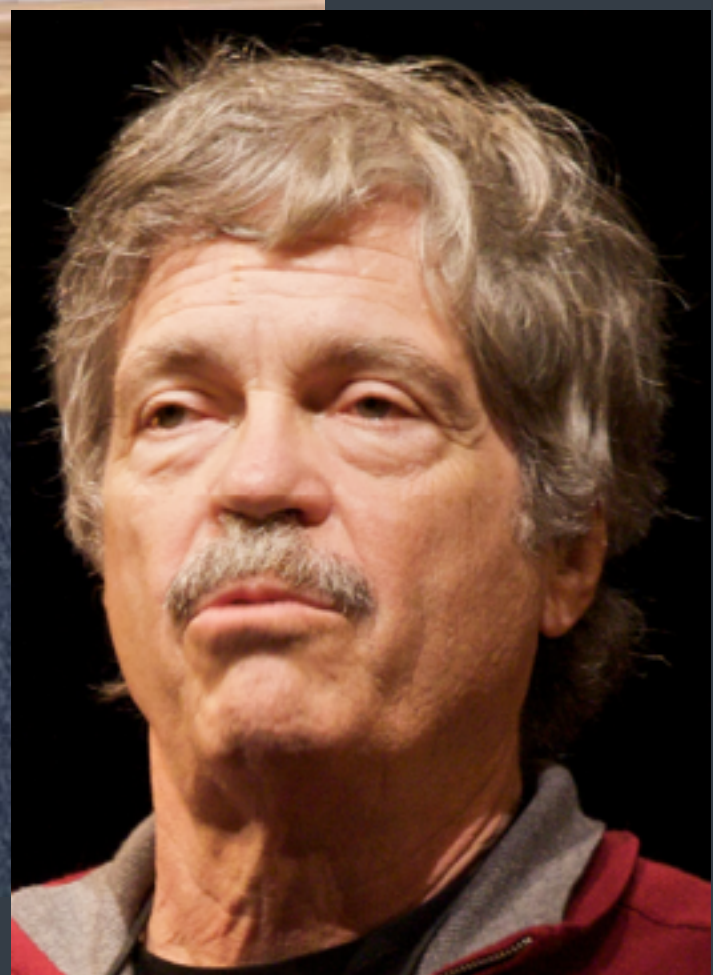
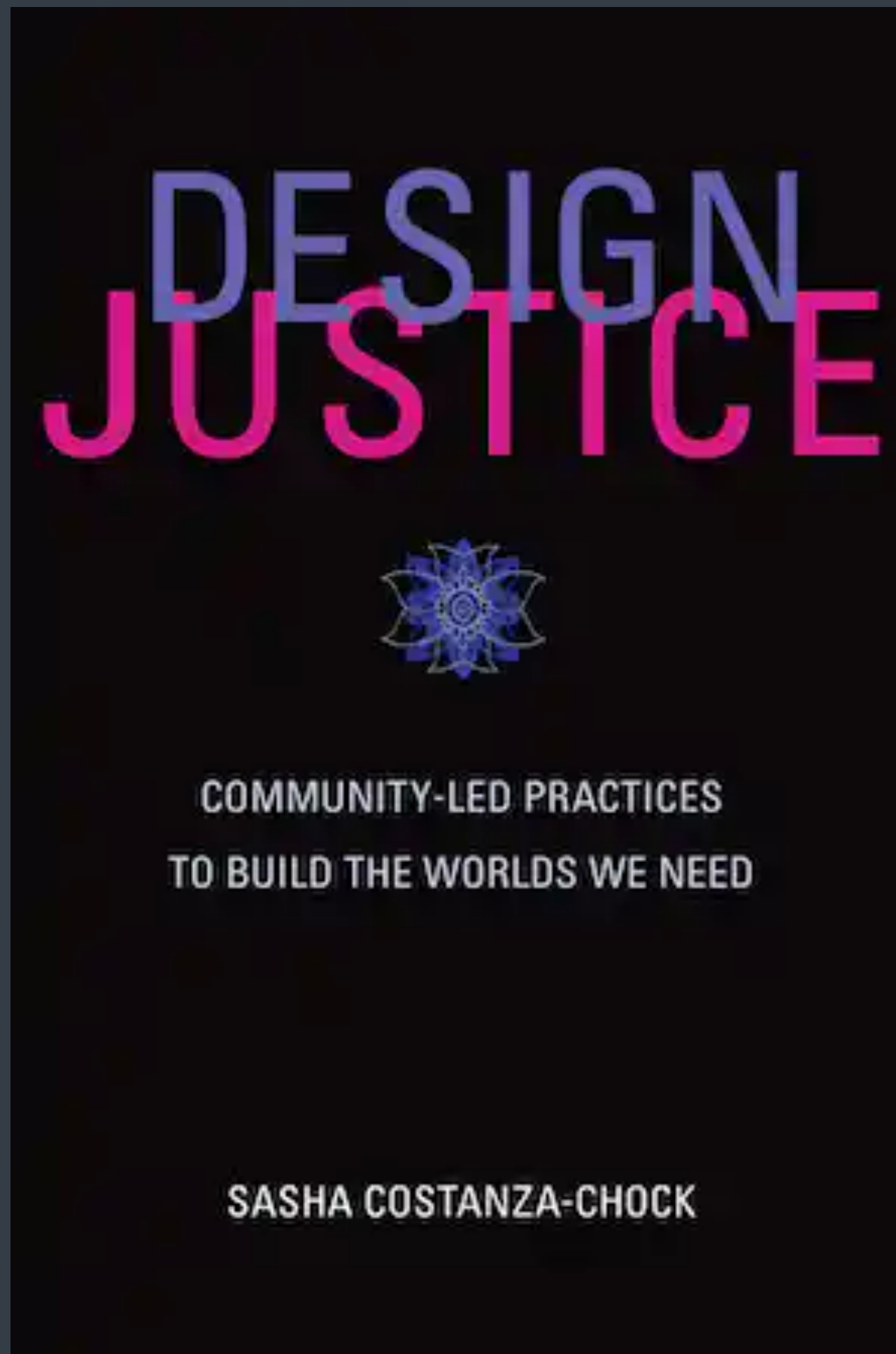
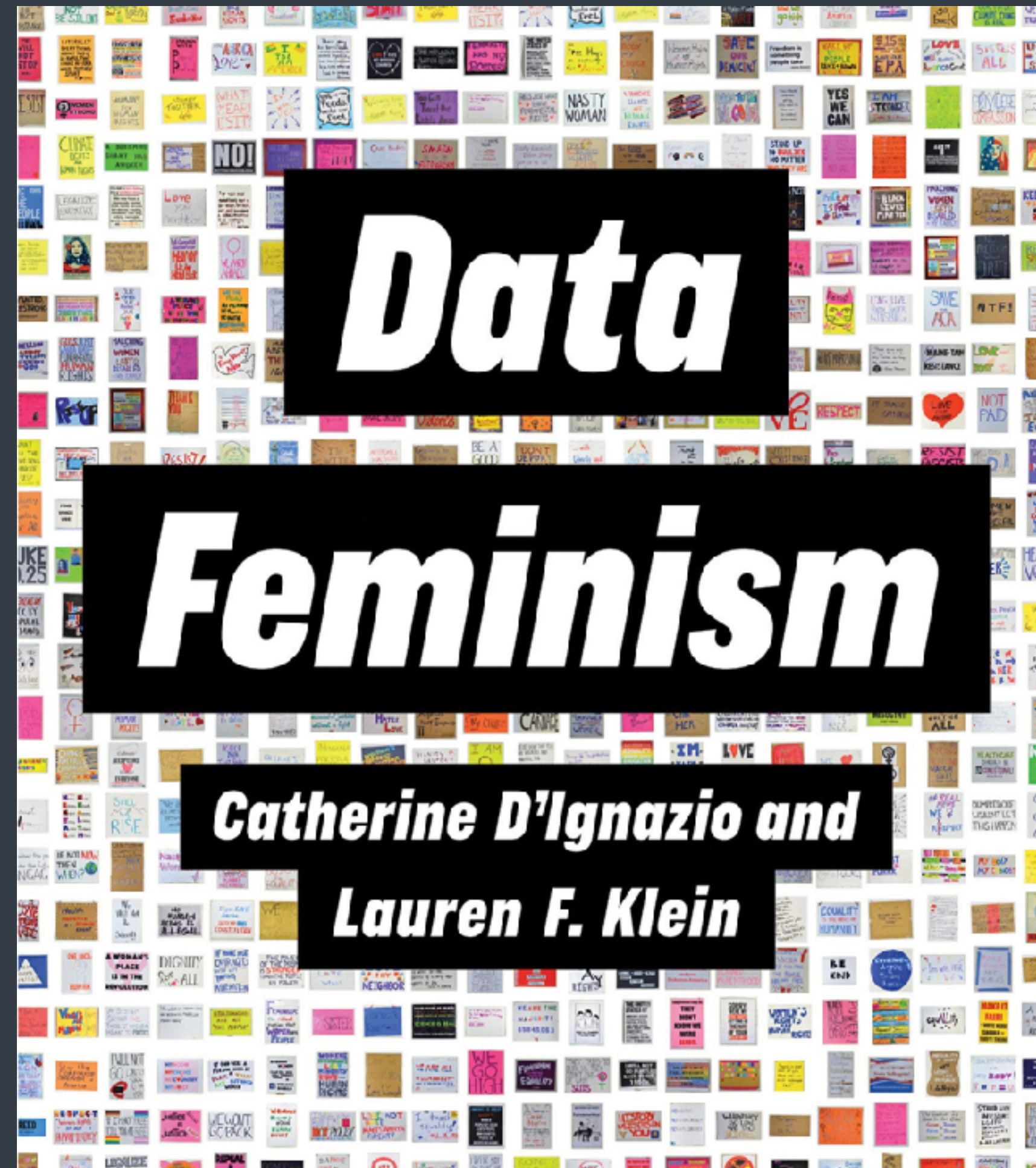


Photo by Marcin Wichary⁵



<https://designjustice.mitpress.mit.edu>



<https://data-feminism.mitpress.mit.edu>

