the PHYSICAL INTERFACE

josh clark
@bigmediumjosh

a quick trip to the near future

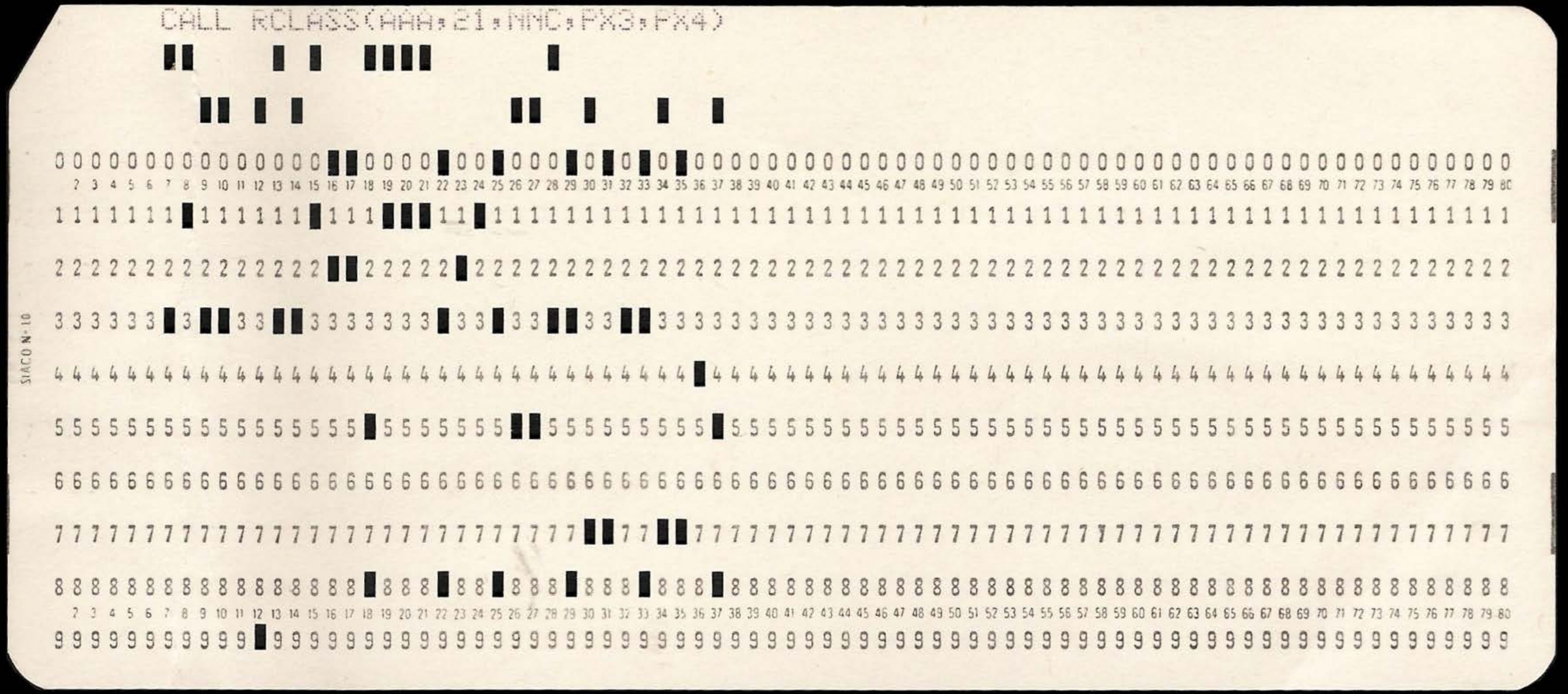
Curious Rituals

curiousrituals.nearfuturelaboratory.com

THERE ARE A MILLION WAYS WE COULD GET THIS WRONG

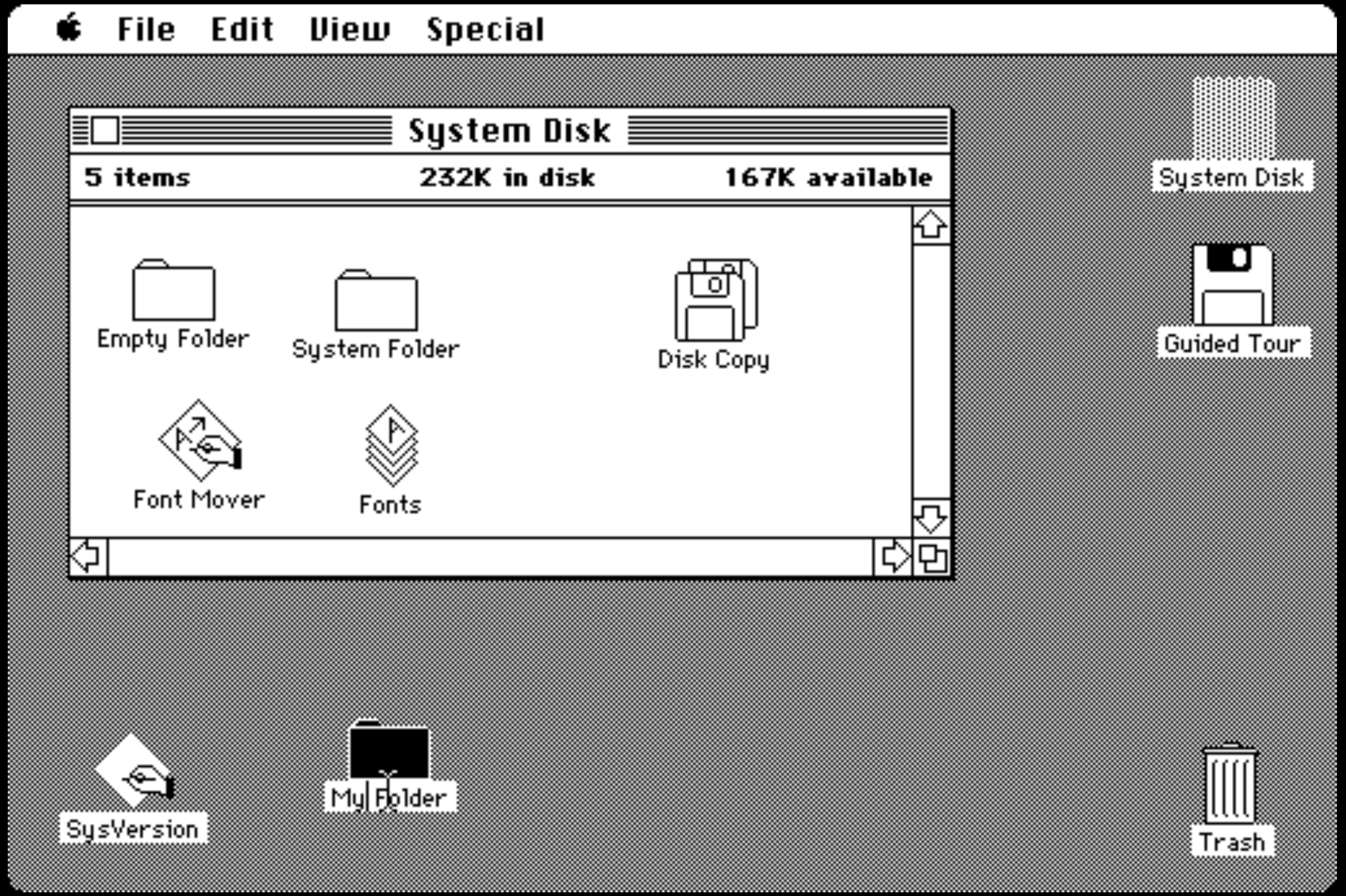
A MILLION WAYS WE COULD GET THIS WRONG

so let’s think hard
about how we might **get it right**


CALL RCLASS(AAA,21,MMC,PX3,PX4)
SIACO N-10

```
*L
C       CALCULATE STATISTICS ON DATA FROM LOW SPEED READER
        SUM=0
        SUMSQ=0
        TYPE 100
100     FORMAT("ENTER THE NUMBER OF VALUES TO CACULATE STATISTICS ON",/)
        ACCEPT 10,N
10      FORMAT(I)
        DO 200 I=1,N
        READ 1,110,V
110     FORMAT(E)
        SUM=SUM + V
        SUMSQ=SUMSQ + V*V
        TYPE 120,I,V
120     FORMAT("VALUE",I,"IS",E,/)
200     CONTINUE
        SAMP=N
        AVRG=SUM/SAMP
        STD=SQTF(SUMSQ/SAMP - AVRG**2)
        TYPE 300,N,AVRG,STD
300     FORMAT("NUMBER OF VALUES",I,"MEAN",E,"STANDARD DEVIATION",E,/)
        END

*
.R FORT
?
```


File Edit View Special
System Disk
5 items
232K in disk
167K available
Empty Folder
System Folder
Disk Copy
Font Mover
Fonts
System Disk
Guided Tour
SysVersion
My Folder
Trash

Groundspeed
GPS Altitude
830'
ETE Next
Accuracy
65m
Maps
Plates
Documents
Imagery
File & Brief
ScratchPad
More

TOUCH DATA

like a physical object

2
THE UNRELIABLE SCREEN
THE SCREEN HAS LONG SEEMED a trusty canvas as the base for our visual interfaces. For most of web design's short history, screens were reassuringly stable. They kept the same aspect ratio for decades, and though they gradually grew in size, they did so at a steady pace. The web design industry settled on standard widths—beginning with 600 pixels in the 1990s, then 800 pixels around 2000, then 980, and finally 1200. And then, suddenly, this fixed-width illusion exploded with the mobile revolution and its bevy of screen shapes and sizes.
Responsive design is the new normal, and thanks to CSS media queries, we've adapted our designs to pocket-sized containers. But touchscreens and other emerging input devices pose stubborn new challenges, like wide-ranging pixel densities and mercurial touch support, that media queries aren't (yet) equipped to handle. Screens no longer provide the solid design footing they once appeared to.
Our mission is to build solid physical interactions on top of this squishy virtual foundation. This chapter explains how
44 DESIGNING FOR TOUCH
Designing for Touch
A BOOK APART
Brief books for people who make websites
№ 14
Josh Clark
DESIGNING FOR TOUCH
FOREWORD BY Brad Frost
kindle

our job is to

TRANSLATE

INTENT → ACTION

DIGITAL → PHYSICAL

PHYSICAL → DIGITAL

sensors smarts connection

THE SMARTPHONE IS THE FIRST HUGE IOT DEVICE

MOBILE gives
COMPUTING POWER to
IMMOBILE OBJECTS

Nappy Notifier

bit.ly/diaper-app

THE WEB HAS SENSOR SAVVY, TOO

www.w3.org/standards/techs/js

- **RECORD AUDIO & VIDEO**
- **UNDERSTAND SPEECH**
- **MAKE & HEAR SOUND**
- **GPS LOCATION**
- **VIBRATE**
- **VIDEO CONFERENCE**
- **ACCELEROMETER**
- **AMBIENT LIGHT**

www.w3.org/standards/techs/js

DO THIS TODAY

WHERE DO WE GO FROM HERE?

four kinds of physical interfaces

SENSOR INPUT TO THE WEB

four kinds of physical interfaces

SENSOR INPUT TO THE WEB

NOTIFICATION FROM THE WEB

four kinds of physical interfaces

SENSOR INPUT TO THE WEB

NOTIFICATION FROM THE WEB

AVATAR OF DIGITAL INFO

four kinds of physical interfaces

SENSOR INPUT TO THE WEB

NOTIFICATION FROM THE WEB

AVATAR OF DIGITAL INFO

PHYSICAL INTERACTION

the web gets physical

1.

SENSOR INPUT TO WEB SERVICES

propellerhealth.com

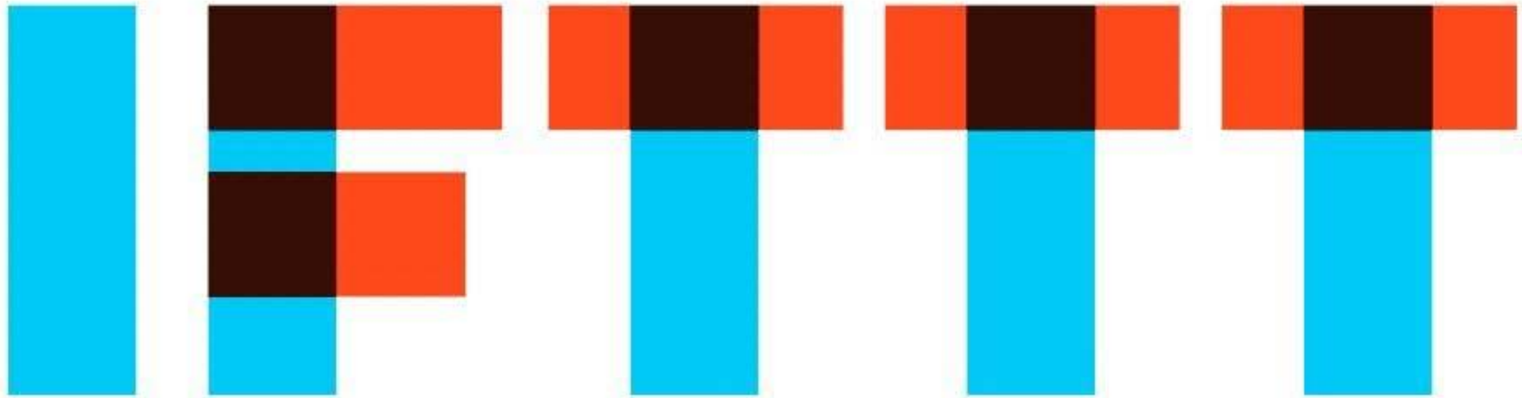
Start
Stop
Tide
Delay start
Temperature
OK
Spin speed
Cottons
Minimum iron
Woollens
Proofing

Generally, you don’t see that kind of behavior in a major appliance.

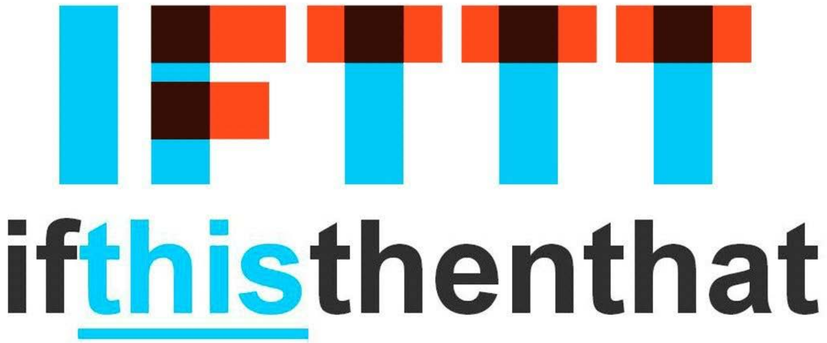
MAXWELL
HOUSE

AWS IoT Button

bt.tn



ifthisthenthat



DO THIS TODAY

the web gets physical

2.

NOTIFICATION FROM WEB SERVICES

THIS IS THE INTERFACE

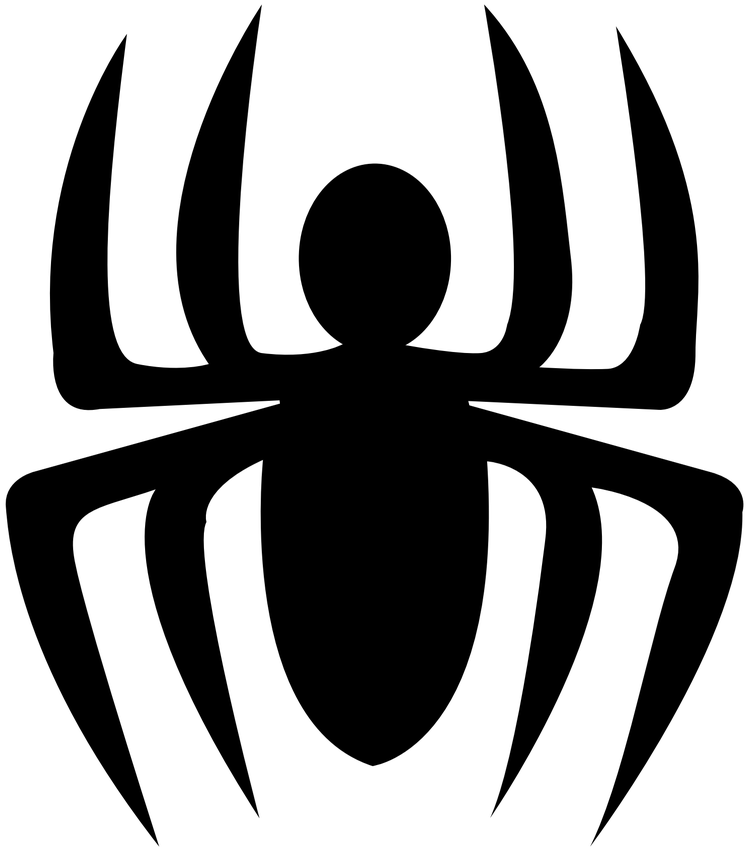
THIS IS THE APP

THIS IS THE BROWSER

WEB ≠ BROWSER

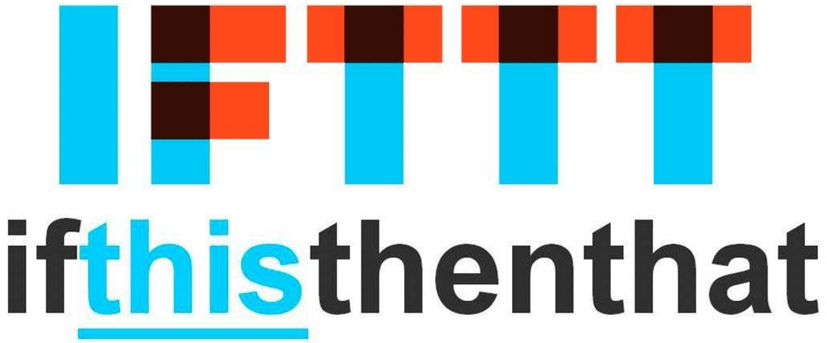
Ringly

Lechal



DESIGN CALM TECHNOLOGY

Mailchimp: Oliver
bit.ly/mailchimp-oliver



DO THIS TODAY

PHYSICAL INTERFACES FOR DIGITAL APIs

the web gets physical

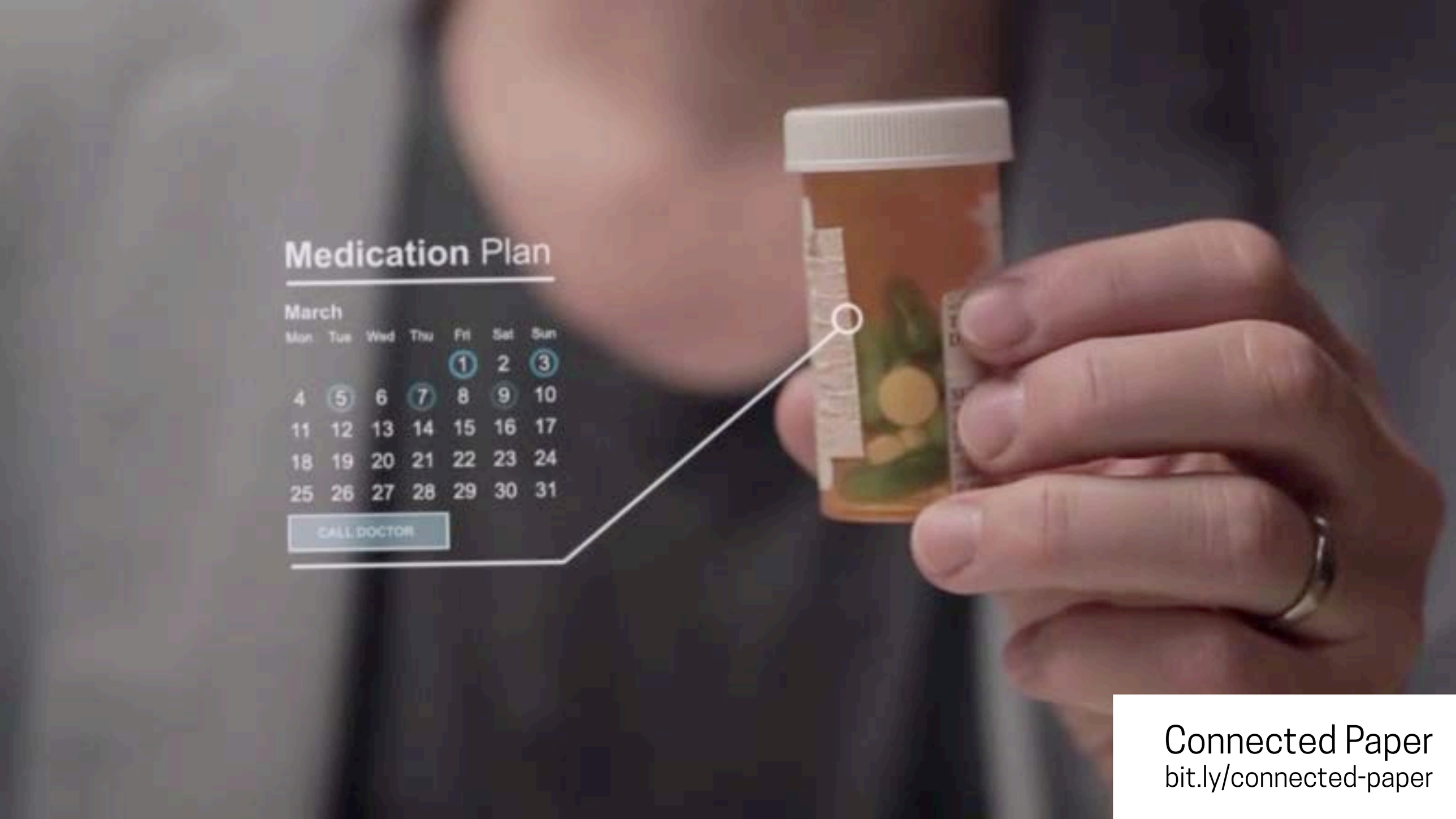
3.

PHYSICAL AVATAR OF DIGITAL INFO

Google has cataloged

1 BILLION ENTITIES, PEOPLE, PLACES & THINGS

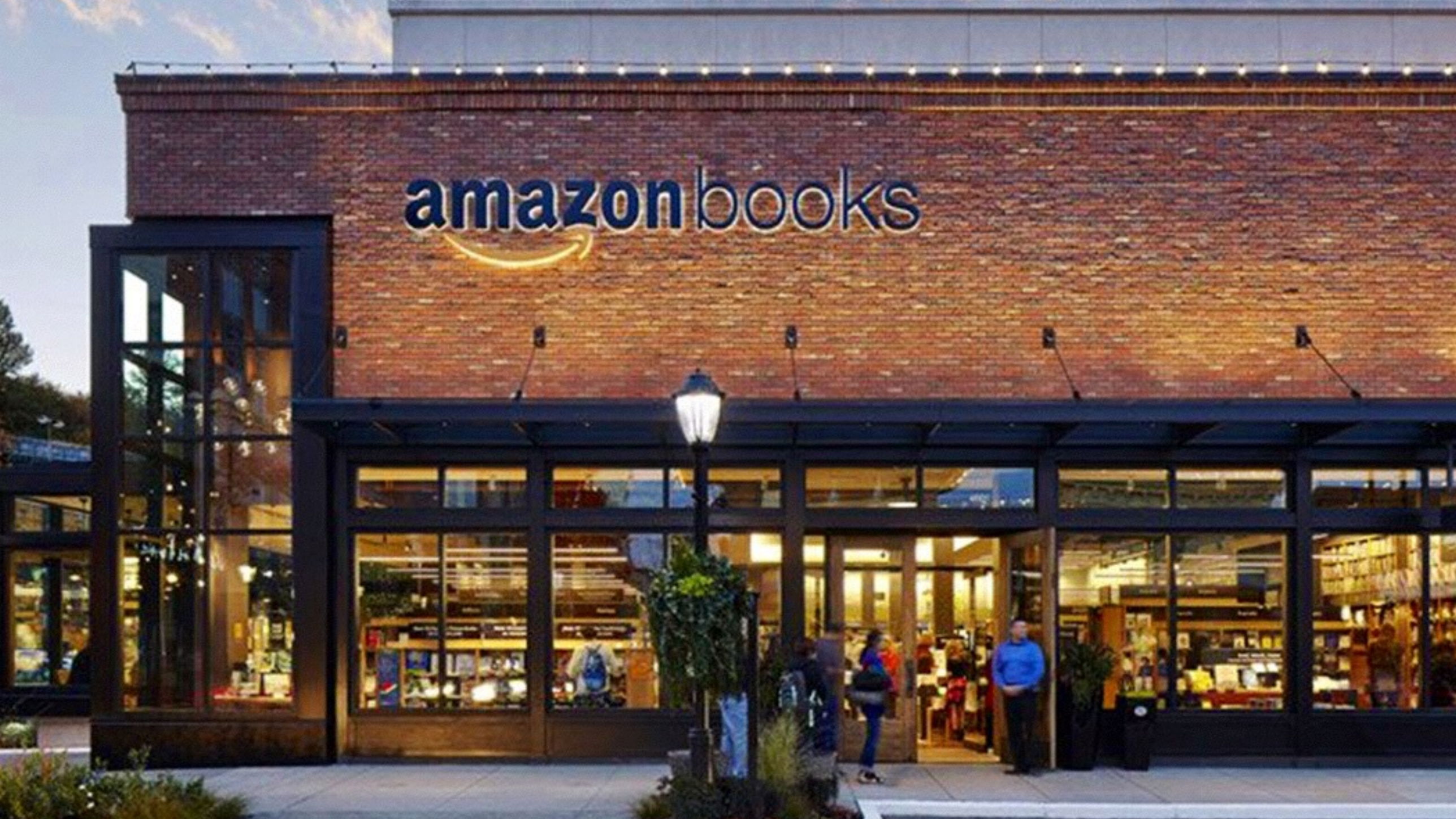
https://stratechery.com/2016/googles-go-to-market-gap/



Connected Paper
bit.ly/connected-paper

What if a physical store could do all the best things an online store can do?

LIZA KINDRED @LizaK


amazon books

Entertainment
Entertainm
MUSICALS
ELIZABETH WARREN
RAP
DOCTOR

Amazon Customer Review

"Lee's debut historical fiction simply made me fall for the history of America, cowboys, the Oregon Trail, unbreakable friendships, first loves, means to survival, racial in-differences and the wild, wild west."

– ADITI SAHA

Under a Painted Sky
by Stacey Lee

4.8 stars - 78 reviews

★★★★★

as of 2/23/2016

Staff Favorites
TRAPS
A NOVEL
MACKENZIE BEZOS
"Taut but nuanced, a character-driven thriller that is both suspenseful and intelligent."
—Vogue
Jeff Bezos, Founder & CEO, Amazon.com
"One of the best books of the decade."
The Remains of the Day
WINNER OF THE BOOKER PRIZE
Kazuo Ishiguro
Jeff Bezos, Founder & CEO, Amazon.com
NEAL STEPHENSON
BESTSELLER ANATHEM
SEVENEVES
A NOVEL
Jeff Bezos, Founder & CEO, Amazon.com

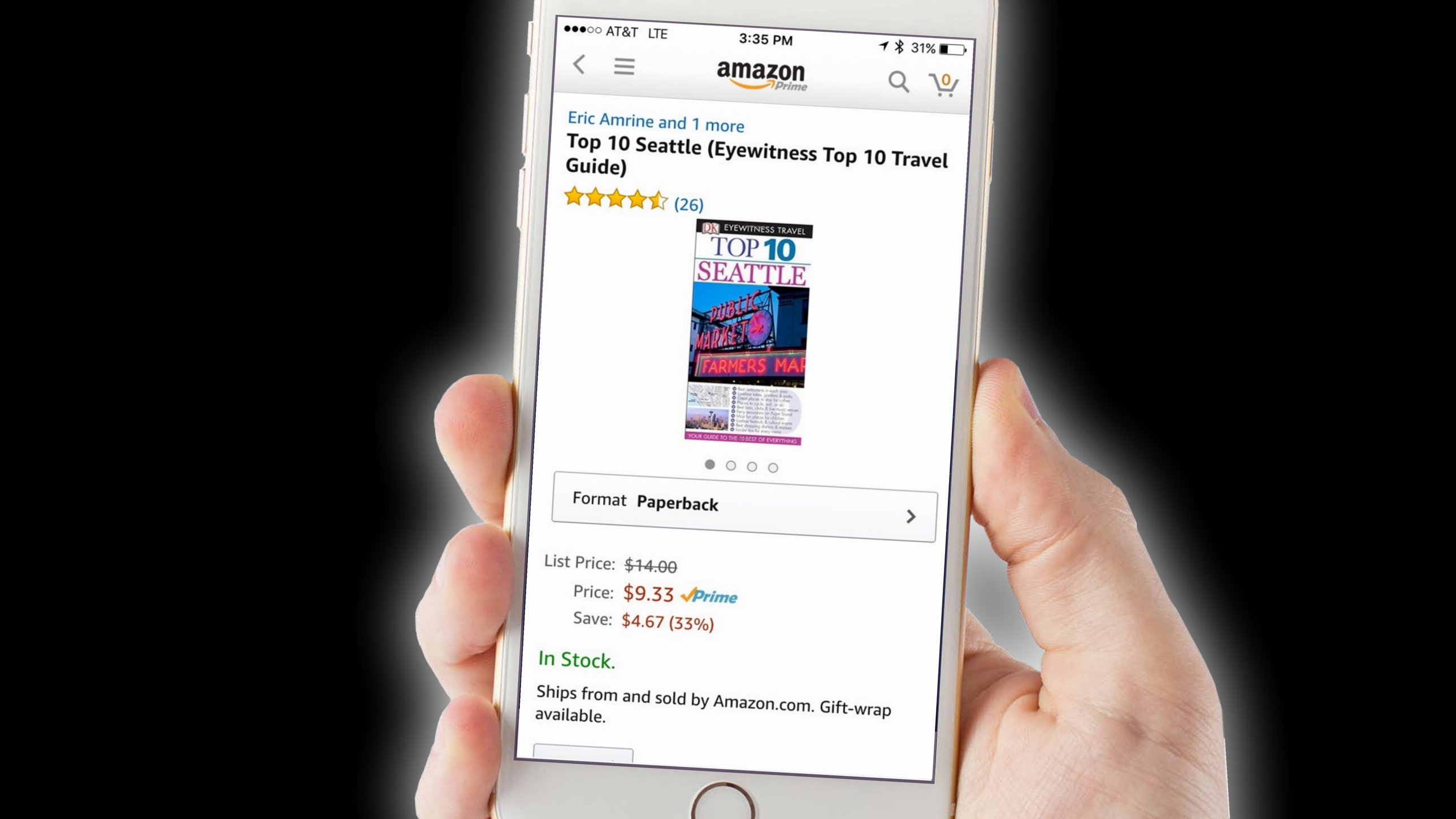
Jeff Bezos, Founder & CEO, Amazon.com

My favorite book. It teaches the dangers and sorrows of life regret better than any nonfiction book ever could.

The Remains of the Day
by Kazuo Ishiguro

4.4 stars - 539 reviews
as of 3/9/2016

AT&T LTE
3:34 PM
33%
amazon
Prime
SEATTLE
PUBLIC MARKET
FARMERS MAR
Pull-out map and guide
YOUR GUIDE TO THE 10 BEST OF EVERYTHING
Amazon Customer Review
"My fiancee and I only had 2 days to spend in Seattle and this book was the key to our success. ... while we were wandering the city we were able to pull it out to make sure we were hitting the most important sites in each neighborhood."
– Snapifer
Top 10 Seattle (Eyewitness Top 10 Travel Guide)
by Eric Amrine
4.5 stars - 25 reviews
as of 10/28/2015
History


AT&T LTE
3:35 PM
31%
amazon
Prime
0
Eric Amrine and 1 more
Top 10 Seattle (Eyewitness Top 10 Travel Guide)
(26)
DK EYEWITNESS TRAVEL
TOP 10
SEATTLE
PUBLIC MARKET
FARMERS MAR
YOUR GUIDE TO THE 10 BEST OF EVERYTHING
Format Paperback
List Price: $14.00
Price: $9.33 Prime
Save: $4.67 (33%)
In Stock.
Ships from and sold by Amazon.com. Gift-wrap available.

Big Magic: Creative Living Beyond Fear
BIG MAGIC
CREATIVE LIVING BEYOND FEAR
$13.72
List price $24.95
Save $11.23

@LizaK asks: what if...

YOU COULD TOUCH A PRODUCT TO GET ITS INFO

@LizaK asks: what if...

YOU COULD TOUCH A ZIPCAR TO RENT IT INSTANTLY

@LizaK asks: what if...

YOU PAID JUST BY WALKING OUT OF THE STORE WITH A PRODUCT

UNLOCK DATA IN PHYSICAL OBJECTS

Lifeprint
lifeprintphotos.com

wemo
PHILIPS

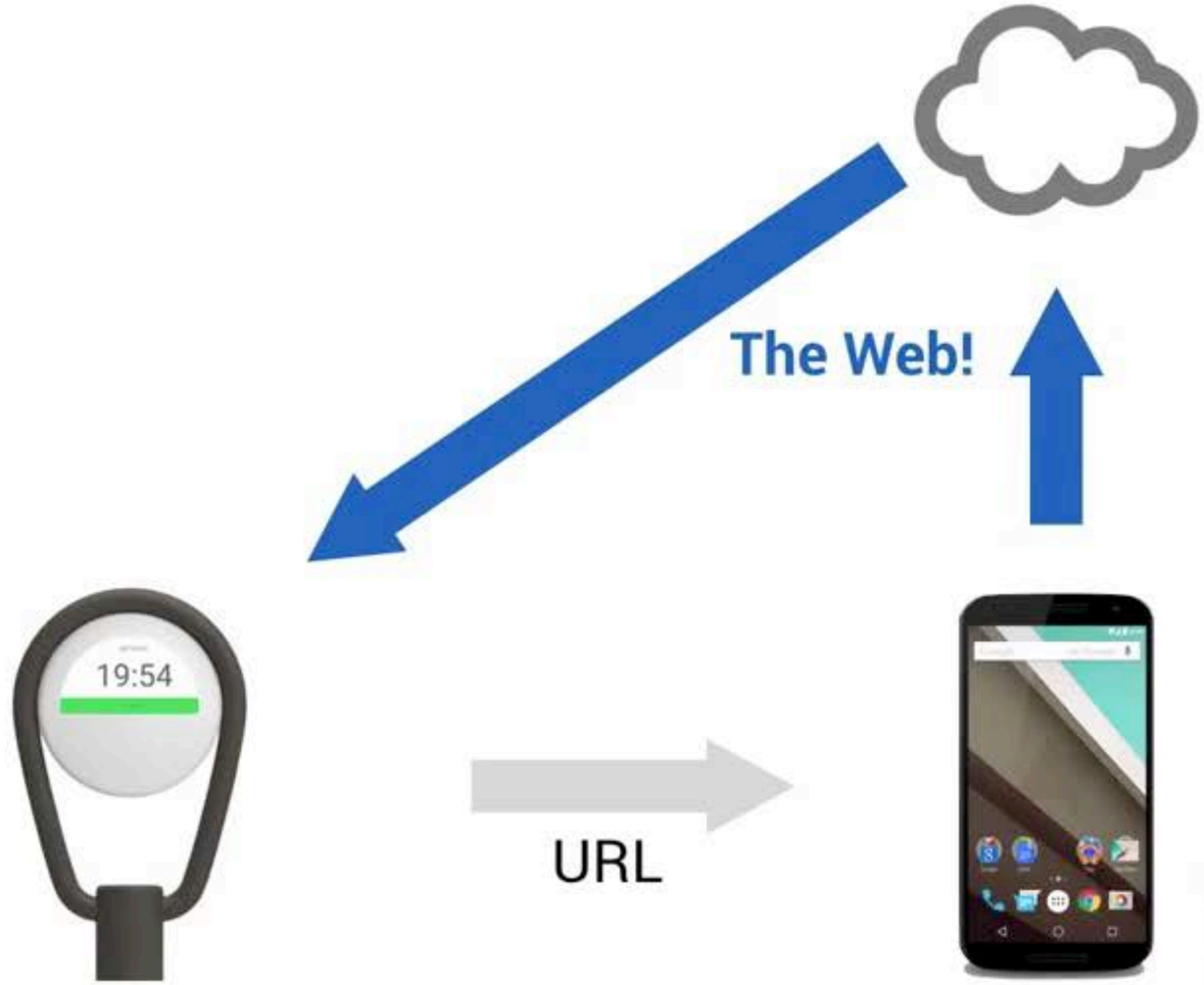
Mary Parks
@maryparks

Following

If I have to launch an app every time I want to use your physical product, or in order for it to be easy to use, you have failed me.

WHERE'S THE UNIVERSAL CONNECTOR NETWORK?

THE PHYSICAL WEB



Google Developers

The Physical Web

bit.ly/physical-web

zipcar.com

physical-web.org

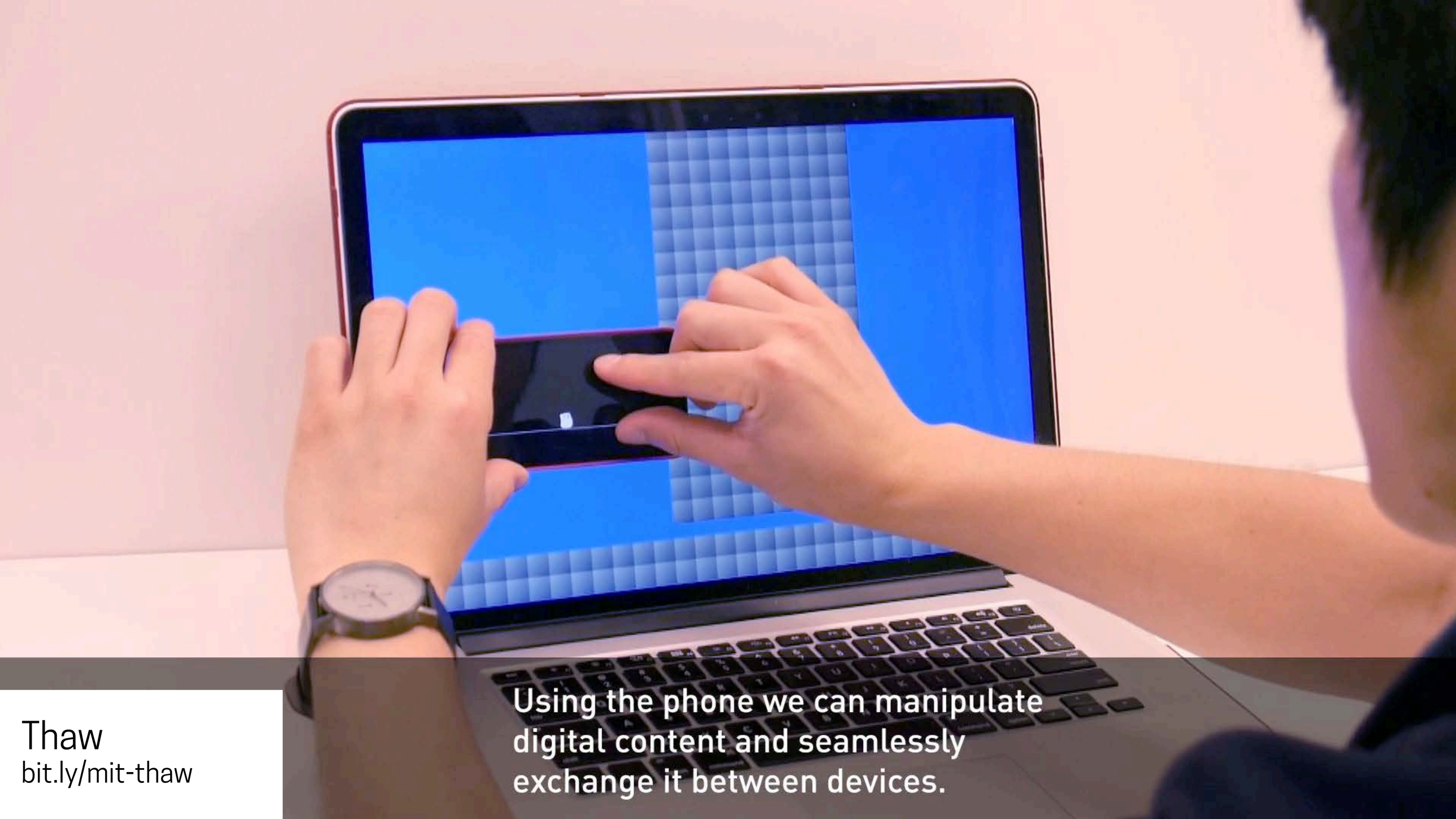
DO THIS TODAY

THE INTERACTION IS STILL ON SCREEN

PHOTO: ERIC J. SMITH

the web gets physical

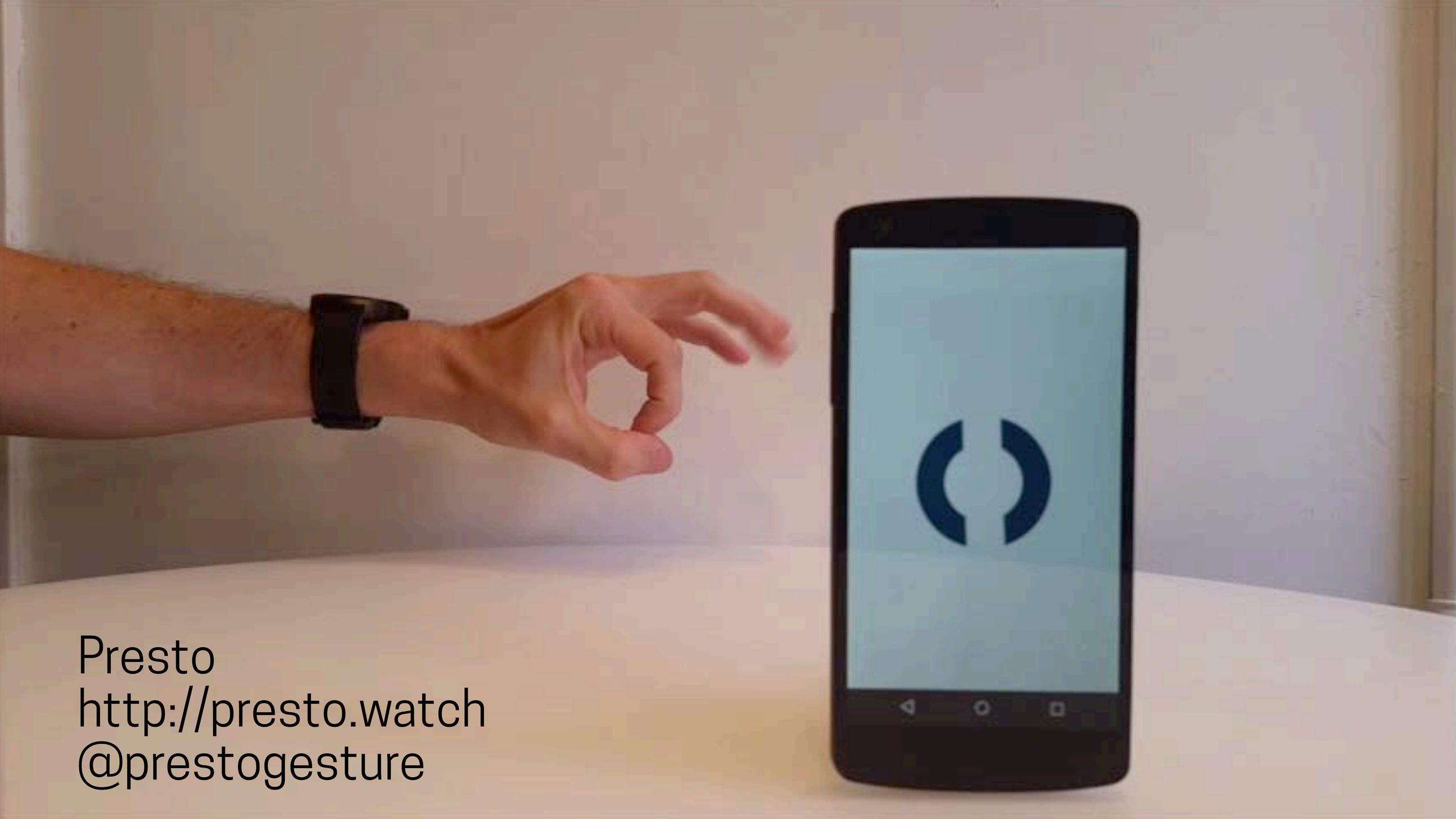
4. PHYSICAL INTERACTION



Using the phone we can manipulate digital content and seamlessly exchange it between devices.

Thaw
bit.ly/mit-thaw

@LARRYLEGEND


Presto
http://presto.watch
@prestogesture

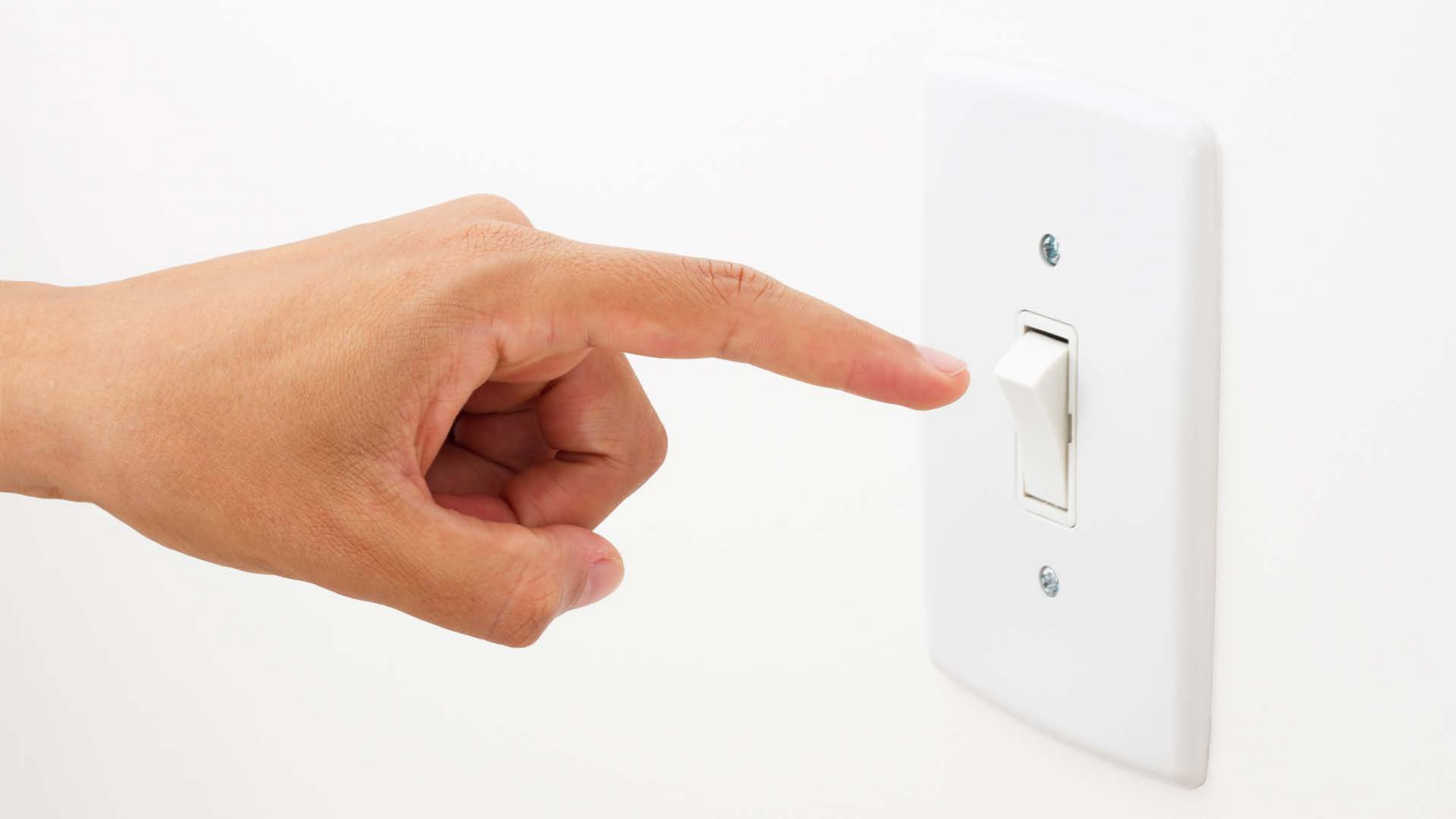
Grab Magic
bit.ly/grab-magic

push the possibilities
of everyday devices

DO THIS TODAY

it’s not a challenge of technology

IT’S A CHALLENGE OF IMAGINATION



Reality Editor

realityeditor.org

Open Hybrid

Open Hybrid is a platform for interaction with everyday objects.

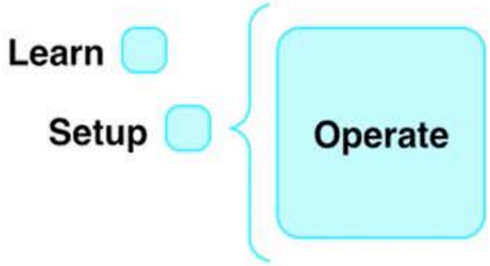
It combines physical objects with the benefits of a flexible augmented user interface.

It is Open Source and based on Web-Technology and Arduino. Join our Community
Find a simple Arduino Yun example here and the Reality Editor in the iOS App Store

Design Guidelines

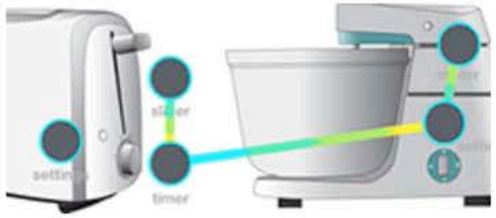
Direct Mapping

The need for new visual Paradigms for the Operation of the Internet of Things.



Learn, Setup and Operate

Think about the Reality Editor as a digital multi-tool for physical space.



How to Connect everything

How to connect the functionality of electronic devices

Open Hybrid

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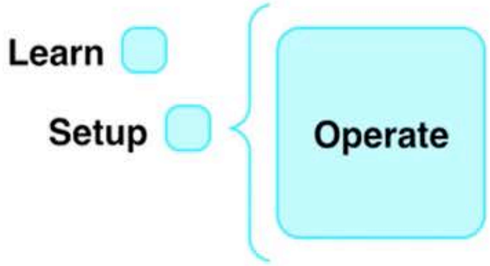

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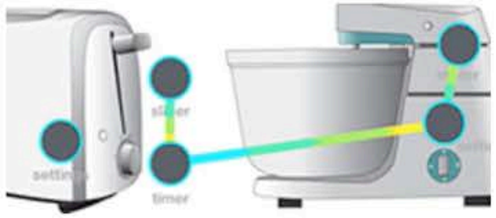


How to Connect everything

How to connect the functionality of electronic devices

SCREENS CONFIGURE

OBJECTS OPERATE

openhybrid.org

DO THIS TODAY

WHAT IF THERE'S NO SCREEN AT ALL?

amazon echo

amazon.com/echo

THIS IS THE THING BEYOND THE PHONE

ONE INTERFACE FOR OVER 300 SERVICES

Ready? Let's get started

Read our getting started guide for an overview of how users interact with your Alexa skill and to learn how to conduct a conversation with your customers. You can also follow these steps:

Design a Voice User Interface

Design an effective voice user interface to give users a great experience
See Voice Design Best Practices

Create a framework to map user requests to intents your service can handle
See Defining the Voice User Interface

Build out sample phrases so that your skill responds to user intents
See Sample Utterances

Build and Host Code

Set up your skill in AWS Lambda or another cloud-based hosting service
See Creating a Lambda Function

Code your skill
See Handling Requests

Review sample code in Node.js or Java
See Alexa Skills Kit Samples

Submit Your Skill

Add your skill to the developer portal
See Registering Skills

Test your skill using our service simulator or on Amazon Echo
See Testing a Skill

Submit your skill for certification
See Submission Checklist

developer.amazon.com

DO THIS TODAY

four kinds of physical interfaces

SENSOR INPUT TO THE WEB

NOTIFICATION FROM THE WEB

AVATAR OF DIGITAL INFO

PHYSICAL INTERACTION

WHY
DO WE MAKE IT?
TO WHOSE BENEFIT?

```
==========UPDATE==========
> You have 15 pairs of underwear left.
    [Ok] [buy more underwear] [find help online]
> Your cat checked in at the litterbox.
> Your microwave just heated a lasagna.
> Record: You stared out the window for 23 minutes.
    [Ok] [post your score]
> Your couch likes your microwave's status update.
> It's raining again.
    [Ok]
> 15 of your things are broken.
> You haven't left the house in 5 days.
    [Ok]
==========
```

http://omershapira.com/blog/2014/09/its-raining-again/

the goal is not to make things talk

IT'S TO IMPROVE THE CONVERSATION

ind.ie/blog/ethical-design-manifesto/

ETHICAL DESIGN MANIFESTO @indie

SURVEILLANCE CAPITALISM

Obligatory mention of

Minority Report

Wayfindr
wayfindr.net

Wink: Robot Butler

bitly.com/wink-butler

HOW SMART DOES YOUR BED HAVE TO BE BEFORE YOU'RE AFRAID TO GO TO SLEEP AT NIGHT?

Rich Gold

A robot vacuum tried to eat its sleeping owner's head

18k
Shares

By Molly McHugh Follow on February 08, 2015

The future of robots is simultaneously thrilling and terrifying. For every mental image of sweet *Wall-E*, there's one of *Terminator*'s invincible red eye. Will our robotic overloads be task-oriented, adorable, and friendly... or will they try to murder us in our sleep?

GIVE THE ROBOTS GOOD VALUES & GOOD MANNERS

Eleanor Saitta
@Dymaxion

Following

$deity spare us all from bright young things with an algorithm, a data set, and the notion that history, causality, & culture are irrelevant

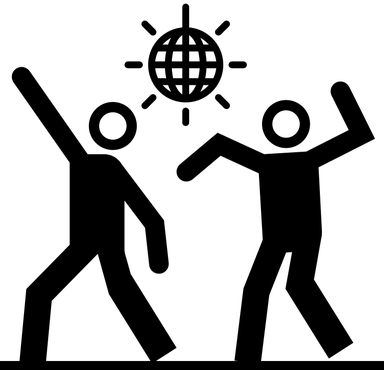
RETWEETS	LIKES
56	58

4:43 AM - 15 May 2016

AMPLIFY OUR HUMANITY

check the values of your creation

DO THIS TODAY



THANKS!

josh clark
@bigmediumjosh