



Between the (book) covers: Design Beyond Devices

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We're designing products
at the final frontier.

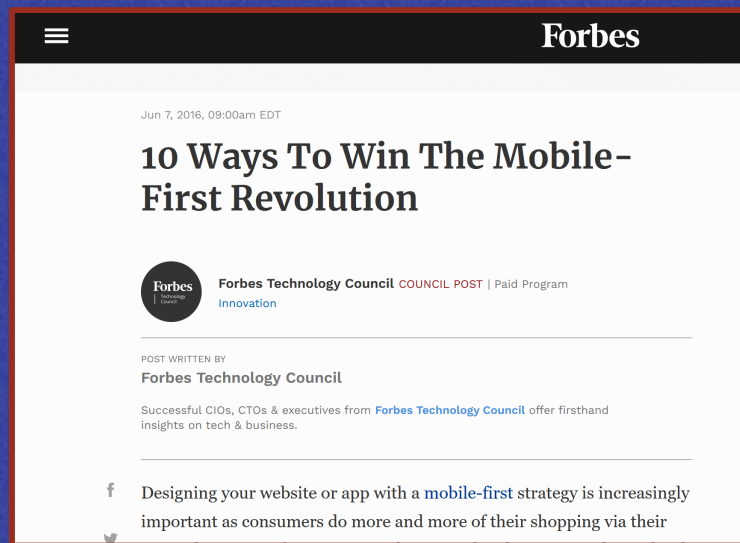
Your customer has 5 senses and a small
universe of devices. Why aren't you
designing for all of them?

**The website has been
declared dead many times
already.**

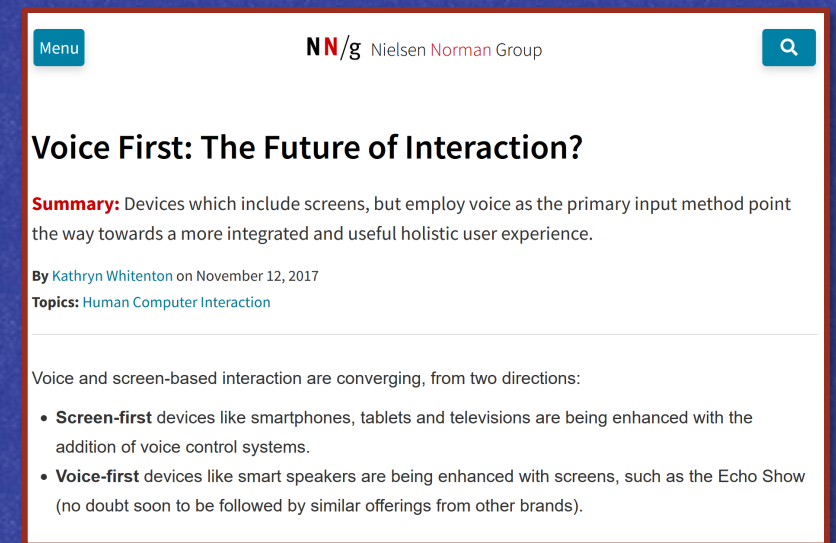
And yet, the web still thrives – but it lives on many devices,
and via many modes of interaction.

And what waits to replace the dearly departed website?

Should you join the mobile-first revolution?



Or is voice-first the way of the future?



Our natural instinct to seek a winner is missing the point. There is no one true interface. And most of the devices your customers are using? They're multimodal.



The future is multimodal, because humans are multimodal.

A **mode** (in this context) is a type of communication, and humans communicate using their senses.

A **multimodal interaction** is an exchange between a device and a human being where multiple input or output modalities may be used simultaneously or sequentially depending upon context and preference.

Multimodal experiences
incorporate classic interactions
like screens, keyboards, mouse,
and touch with newer tech like
voice, gesture, lights, and sensors.



Visual

Projection or rendering of a stimulus that will be interpreted over optical channels—from books and e-readers to GIFs and videos.



Auditory

The use of acoustic waves to communicate meaning: music, sound effects, or language.



Haptic

Communicating meaning with changes to the physical environment: pressure, vibration, force feedback, or direct manipulation like taps or clicks.



Kinetic

Communication based on movement or orientation in space.



Ambient

Inferred meaning driven by environmental or biometric conditions: temperature, heart rate, lighting, etc.

Communication Modalities

As defined in the book; there is some debate about how to split the Kinetic and Ambient categories.

Note that these don't align 1:1 to the human senses.



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Your customer has five senses and a small universe of devices. Why aren't you designing for all of them? Go beyond screens, keyboards, and touchscreens by letting your customer's humanity drive the experience—not a specific device or input type. Learn the techniques you'll need to build fluid, adaptive experiences for multiple inputs, multiple outputs, and multiple devices.

Print & Ebook:

[Rosenfeldmedia.com](https://rosenfeldmedia.com) or [Amazon \(US/CA/UK\)](#)

Kindle only: [Amazon in Europe/Japan](#)

**Thinking of writing a book?
You're going to agonize over
your blurb for a LONG time.
From the very beginning,
in fact.**

Design beyond Devices

by Cheryl Platz


News of the website's death has been greatly exaggerated, but we can no longer assume our customers will sit down at a desktop or mobile site to complete tasks. Reality is more complicated: a single customer journey might span a website, a mobile app, a smart speaker, and a car. The future is multimodal, and multi-device.

Speech, touch, gesture, sensors, screens: learn to weave a natural experience beyond the boundaries of any single device while keeping customers at the center of it all. *Design beyond Devices* is an indispensable handbook for interaction designers and information architects navigating today's device-agnostic frontier.

My original pitch document!



Coming early 2020 to Rosenfeld Media



But why did I propose writing this book?

This kind of insight remains locked up in big companies.

- Multimodal design has been limited largely to the big players: Amazon, Google, etc.
- Those big players have been notoriously slow about sharing their philosophies

Many teams don't have the time for systems thinking.

Even when I proposed some predecessors to these ideas at Amazon, the team was moving too fast to incorporate them. What about smaller, less-funded teams?



But in the context of today's multi-input systems, multimodal has a specific meaning.

In the context of this book, my definition of a multimodal interaction is “an exchange between a device and a human being where multiple input or output modalities may be used simultaneously or sequentially depending upon context and preference.”



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And why include both “multimodal” and “cross-device” experiences?

It's short-sighted to assume ANY experience exists in a vacuum. **Our customers are swimming in devices.**

Even websites are cross-device now: most websites have to function on desktop and mobile, which means interruption, context, and notifications become relevant.

And the limits of multimodality on one device **may cause a customer to turn to another device.**

**Let's dive into the
specific content and see
what's between the
covers!**



The book can be divided into four themes:

1. Customer context & ethics
2. Multimodal frameworks
3. Ideation and Execution
4. Emerging technology

Chapter	Title	Theme(s)
Chapter 1	Creating the World We Want to Live In	1
Chapter 2	Capturing Customer Context	1
Chapter 3	Understanding Busy Humans	1, 2
Chapter 4	Activity, Interrupted	1, 2
Chapter 5	The Language of Devices	2
Chapter 6	Expressing Intent	2
Chapter 7	The Spectrum of Multimodality	2
Chapter 8	It's a Multimodal Trap!	3
Chapter 9	Lost in Transition	3
Chapter 10	Let's Get Proactive	2, 3
Chapter 11	Breathe Life into the Unknown	3
Chapter 12	From Envisioning to Execution	3
Chapter 13	Beyond Devices Human + AI Collaboration	4
Chapter 14	Beyond Reality: XR, VR, MR, AR	4
Chapter 15	Should You Build It?	1, 3

Chapter Listing

The book can be divided into four main “themes”:

1. Customer context & ethics
2. Multimodal frameworks
3. Ideation and Execution
4. Emerging technology

Creating the World We Want to Live In

The opening chapter introduces key concepts you'll need to build a strong foundation for your work: **disability and inclusive design, anti-racism, and anti-neutrality**. Featuring Dr. Kim Crayton's #causeascene guiding principles.

Understanding Busy Humans

A framework for **transforming your customer understanding into activity patterns** you can represent in your platform or system – in pursuit of more polite interruptions and more appropriate interactions.

Capturing Customer Context

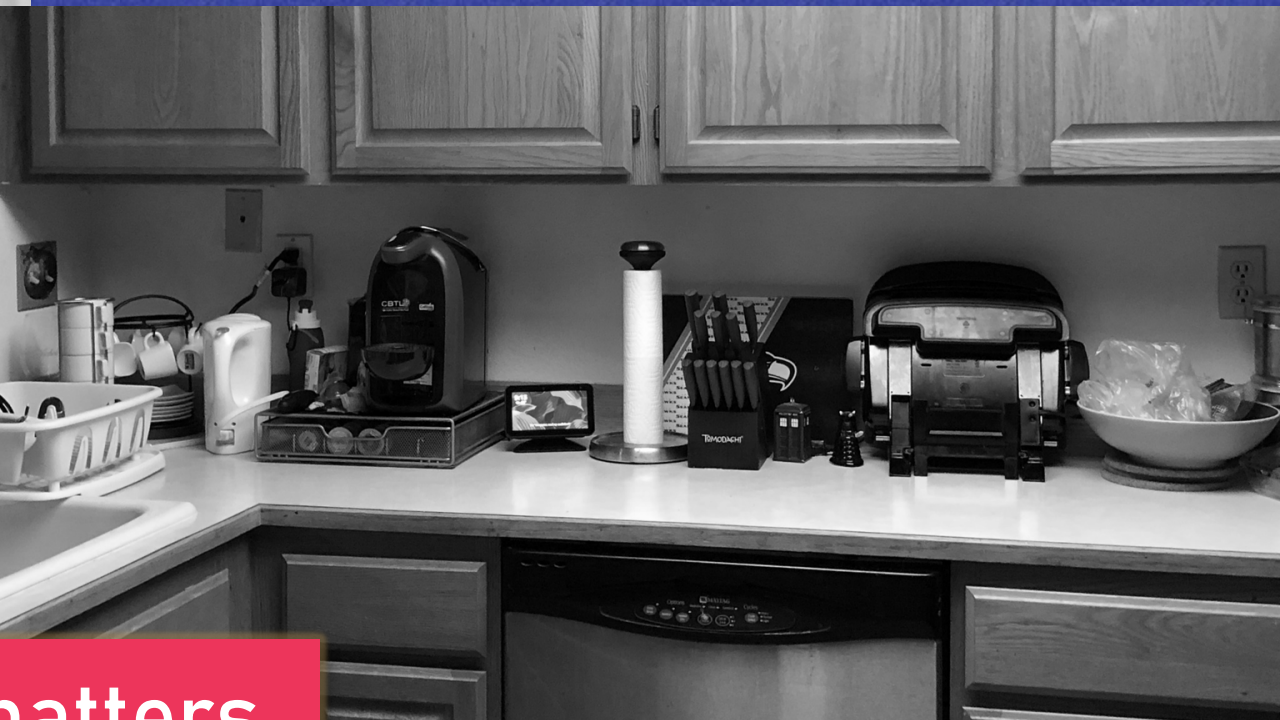
When you're designing for multimodality, assuming your customer is seated at a desk or tethered to a phone isn't enough. I explore an **improv-inspired framework for defining your customer's context** more fully.

Should You Build It?

A chapter devoted to a new framework for ethically querying your work: PICS or It Shouldn't Happen. You'll find a series of prompts to challenge your **problem** definition, your degree of **inclusion**, your theory of **change**, and the **systems** you're influencing.

Theme 1: Customer Context and Ethics

In addition to these dedicated chapters, you'll find this theme woven throughout the book: like the Opti-Pessimism guidelines for creative and ethical ideation included in the chapter on exploration.



Context matters.



Activity, Interrupted

It's not practical to come up with unique designs for interrupting every event in the system. Instead, you need to apply patterns – both to the activities being interrupted, and the types of interruptions. Once you do, you can build an [interruption matrix](#).

Let's Get Proactive

What are the [common patterns of interruption](#)? What are the [philosophies and pitfalls](#) behind proactive interactions in interactive systems? This chapter draws from my experience on notification systems to help you chart your own path.

The Spectrum of Multimodality

Where does your experience fall in the world of multimodal experiences? What type of multimodal experience is right for your available devices and customer context? Let this [multimodal interaction model](#) help.

From Envisioning to Execution

In the midst of the discussion of implementation, we explore an extension of Brad Frost's Atomic Design to cope with the added complexity of multimodality – [multimodal atomic design](#).

Theme 2: Multimodal Frameworks

In addition to these formal frameworks, you'll find tons of helpful content – like a whole chapter on the types of transitions you'll need to design for, and another chapter on common traps.

Your Interruption Matrix

Learn from my experience on systems like the Alexa platform and discover how to abstract large and complicated systems into manageable patterns of predictable interruptions.

Interruption	Current Foreground Activity			
		Short-running activity (e.g. Weather TTS)	Live Activity (e.g. Active Phone Call)	Long-Runing Activity (e.g. Music Service)
Urgent Notification (e.g. Incoming Call)	VUI	STOP Weather TTS *RING* "Incoming Call from Prof. Plum"	CONTINUE Phone Call *RING* (No Announcement)	SUSPEND Music *RING* "Incoming Call from Prof. Plum" RESUME Music
	GUI	Full Screen App (Active Call) ("Professor Plum is calling.")	Full Screen App (Active Call) ("Professor Plum is calling.")	Full Screen App (Active Call) ("Professor Plum is calling.")
Scheduled Notification (e.g. Timer)	VUI	CONTINUE Weather TTS *Short Timer Alert Tone*	CONTINUE Phone Call *Short Timer Alert Tone*	SUSPEND Music *Long Timer Alert Tone* RESUME Music
	GUI	[LAUNCH] Full Screen App (Timer) Full text: "Turkey timer is complete"	Full Screen App (Timer) Full text: "Turkey timer is complete"	Full Screen App (Timer) Full text: "Turkey timer is complete"
Standard Notification (e.g. Message)	VUI	CONTINUE Activity *Notification Earcon*		
	GUI	Notifications with preview (e.g. Message): Banner Notification with the Message preview Notifications w/o preview (third party skills): Persistent card on the home screen after screen times out to Home.		
Customer Speaks to Device (Wake Word)	VUI	STOP TTS Only (Retain context of last prompt)	CONTINUE Phone Call	SUSPEND immediately
	GUI	Display voice chrome and retain context (if user's to-do list was on the screen before the user spoke, it remains)		
Wake Word + Error		REPEAT Weather TTS	CONTINUE Phone Call	RESUME Music
User Requested Live Activity (e.g. Pick up an Incoming Call)	VUI	STOP Weather TTS	STOP original Phone Call	PAUSE Music
	GUI	SWITCH to Full Screen App (Active Call)	SWITCH to Full Screen App (Active Call) (for the new call)	SWITCH to Full Screen App (Active Call)
User Requested Short Activity (e.g. "WW, what time is it?")	VUI	STOP Weather TTS	CONTINUE Phone Call START Short Activity	SUSPEND Music
	GUI	SWITCH to Full Screen App (Clock)	SWITCH to Full Screen App (Clock)	SWITCH to Full Screen App (Clock)
User Requested Long Activity (e.g."WW, play Spotify")	VUI	STOP Weather TTS	CONTINUE Phone Call START Spotify	STOP Prime Music
	GUI	SWITCH to Full Screen App (Spotify)	Chrome Transport Controls	SWITCH to Full Screen App (Spotify)



Dimensions driving multimodality

How rich is your information?

- Low information density
Smart watch or wearable
- High density
Book or computer screen

How close is the device to the customer?

- Close proximity
Wearable to arms-reach
- Long range
3-10 feet

RICH INFORMATION

QUADRANT 2 **Anchored**

Experiences with rich physical presence where a customer is usually nearby.

*Fire TV, Xbox One,
Cortana on PC*

QUADRANT 1 **Adaptive**

Experiences that support both close proximity and long-range interactions.

*Echo Show, Facebook Portal,
Google Nest Hub*

QUADRANT 3 **Direct**

Customer and device must be in direct contact or extreme proximity for use.

*Fitbit, Google Glass,
Hololens, Apple Watch*

QUADRANT 4 **Intangible**

Hands-free experience where close proximity to the device is not required.

*Echo (original)
Google Home*

CLOSE PROXIMITY

LONG RANGE / FAR FIELD

SCOPED INFORMATION

The Spectrum of Multimodality

By plotting information density and proximity on a grid, you can place all current and future experiences in one of four categories.

It's a (multimodal) trap!

Seasoned veterans of multimodal and cross-device design will know when to ask difficult questions, but will you? This chapter covers some of the stickiest areas you're likely to encounter – from ergonomics to multi-user scenarios.

Breathe Life into the Unknown

From the Opti-Pessimism framework from exploring the best and worst cases of your idea to storyboarding, bodystorming, and a variety of prototyping philosophies – this chapter will kick-start your attempts to make your ideas real.

Lost in Transition

Whether you're focusing on a single multimodal device or an expansive cross-device experience, transitions will make or break your experience. We'll inventory the most difficult types of transitions and what to look out for along the way.

From Envisioning to Execution

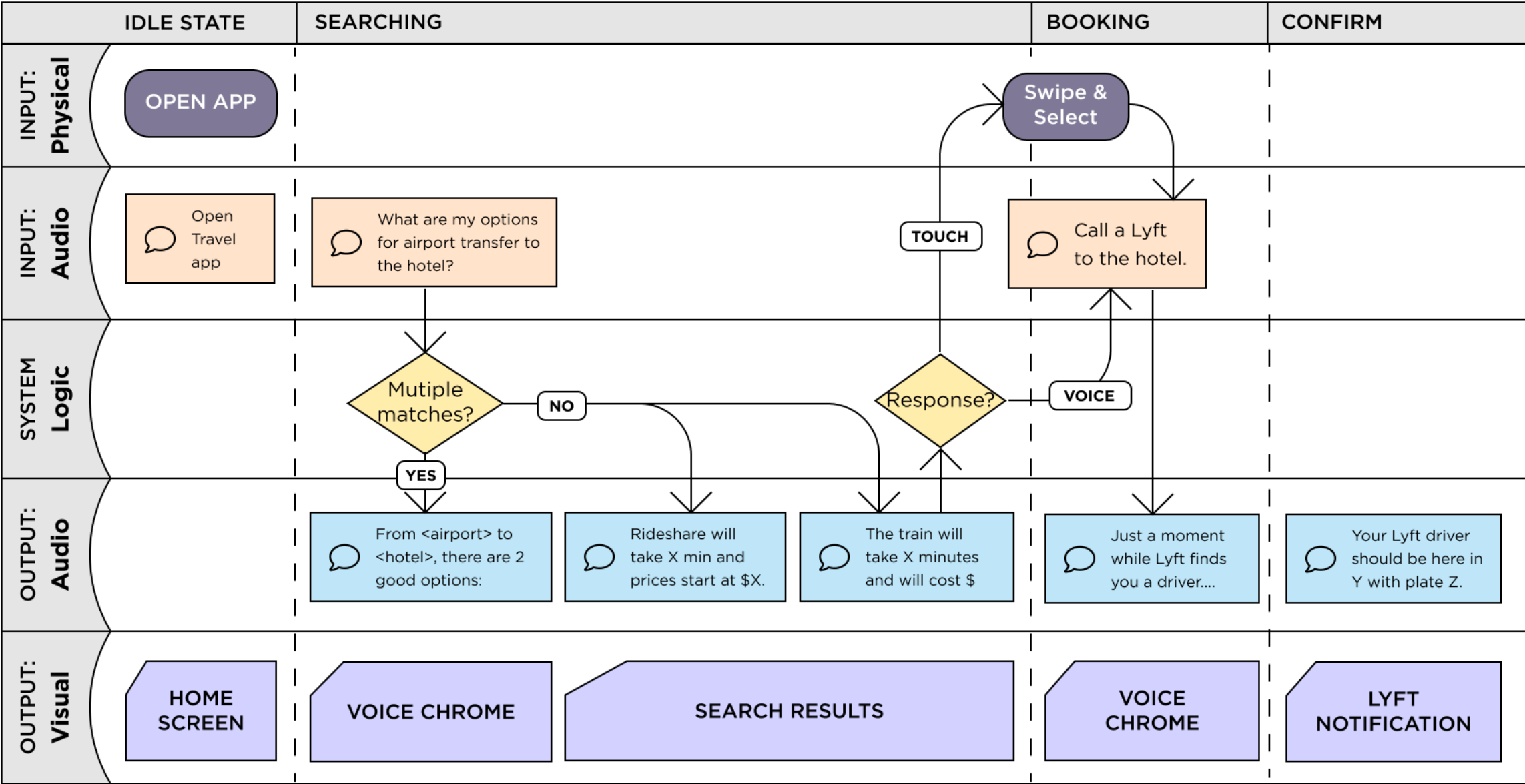
Learn a common visual language for multimodal flows, review tangible examples of multiple approaches to documenting time-bound multimodal designs, and explore how you might expand existing design systems to account for multimodality.

Theme 3: Ideation and Execution

In addition to these formal frameworks, you'll find tons of helpful content – like a whole chapter on the types of transitions you'll need to design for, and another chapter on common traps.

Multimodal swim lanes: Smart Watch Airport Transfer

INPUT: Touch, Dial, Voice
OUTPUT: Audio, Screen



The Language of Devices

In this chapter, we take a complete inventory of the available output modalities and technologies available to you, along with inclusivity considerations and case studies along the way.

Beyond Devices: Human + AI Collaboration

It is near-impossible to work with modern multimodal systems without dealing with AI. Learn the basics: types of machine learning, types of bias, and how to cope with designing with AI on your project.

Expressing Intent

An exploration of the current state of input technologies, from natural language understanding through gestural interfaces – with plenty of inclusivity considerations and case studies to flesh out your understanding.

Beyond Reality: XR, VR, MR, AR

At the bleeding edge of multimodality, extended reality experiences are just pushing from niche to mainstream. Learn the difference between virtual reality, mixed reality, and artificial reality – and what makes design for XR different.

Theme 4: Emerging Technology

**Rosenfeld Media is big on
community engagement.
So what experts did I
interview for the book?**

Name	Career	Topic	Chapter
Janice Y. Tsai, PhD	Research Scientist	Global Social Context	3
Syed Sameer Arshad	Computational linguist	Multilingual multimodality	6
Cathy Pearl	Design Manager on Google Assistant	Going from voice-only to voice-forward	7
Jen Cotton	UX Lead at Google Nest, former Amazon Lead UX Designer	Techniques for transitions between modalities	9
Anna Abovyan	Director of UX at PPG	Minimizing notifications and directing attention	10
Craig Fox	Principal Design Director of IoT and Windows MR at Microsoft	Brainstorming techniques for extended reality	11
Brad Frost	Author, Atomic Design	Multimodal atomic design	12
Ovetta Sampson	IDEO Alumna and MSFT Creative Director	Defining what not to design with AI	13
Jesse Schell	CEO, Schell Games	Input and output techniques for virtual reality	14
Casey Fiesler, PhD	Director, Internet Rules Lab @ Univ of Colorado Boulder	Drawing design ethics lessons from science fiction	15

Featured Expert Interviews

Thank you to all of my interviewees for generously contributing your time and expertise!

Worksheet 1: Shared Understanding Baseline



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Constraints

What are the business objectives?

Who are the key stakeholders?

Is there a timeline or key dates?

What do we know?

What previous research has been completed?

Capturing Customer Context
Worksheet 2: Visualizing Context

What do you know? Sketch the key aspects you know - or hypothesize - about your customer's context.

Who is your customer?
Where is your customer?
What do they need to accomplish?
Why are they seeking help?

1. Know - or - Hypothesis? 2. Know - or - Hypothesis?

Worksheet 3: Capturing CROW



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As you review the team's sketches, capture relevant insights about your customer's CROW.

C: Character	R: Relationships
Customer identity	Human-to-device
Cultural influences	Human-to-business
	Human-to-human

<https://bit.ly/DBDContextWorksheets>

Worksheet 4: Open Research Questions

Check the items you believe you understand, and circle those that re

C: Character	R: Relationships
ATTITUDES <ul style="list-style-type: none"> <input type="checkbox"/> How does your customer define their own identity to themselves and others? <input type="checkbox"/> How does your customer differ from other customers when communicating? <input type="checkbox"/> Would your customer have any physical limitations that might impact their experience? <input type="checkbox"/> Which of your customer's attributes are underrepresented in the greater population? ATTRIBUTES <ul style="list-style-type: none"> <input type="checkbox"/> What cultural influences have shaped your customer's preferences and beliefs? <input type="checkbox"/> What is your customer's likely emotional state when starting this experience? <input type="checkbox"/> Would this customer have any relevant preconceived opinions or learned behaviors? CHOICES <ul style="list-style-type: none"> <input type="checkbox"/> Why would a customer choose to seek out your experience? Did they have a choice at all? <input type="checkbox"/> What choices are you asking your customer to make when engaging with you? <input type="checkbox"/> How does your customer express individuality? Is your experience part of that expression? 	HUMAN TO DEVICE <ul style="list-style-type: none"> <input type="checkbox"/> How long has your customer owned the device? Who owns it? <input type="checkbox"/> Does your customer consider the device expensive & treasured, or common? <input type="checkbox"/> Does your customer anthropomorphize the device? Are they likely to give it a name? <input type="checkbox"/> How much time does your customer spend with the device, and how do they use it? HUMAN TO BUSINESS <ul style="list-style-type: none"> <input type="checkbox"/> Does your customer deal with your company or a 3rd party? <input type="checkbox"/> Did they get to choose to use your service? <input type="checkbox"/> What are your customer's expectations for your business and your brand in this situation? HUMAN TO HUMAN <ul style="list-style-type: none"> <input type="checkbox"/> Is the experience used by multiple people? At the same time, or do they take turns? <input type="checkbox"/> Who determines who will share a specific device? Head of household? Manager? Someone else? <input type="checkbox"/> When sharing an experience, do your customers trust each other?

O: Objective	W: Where
Short-term objectives	Locations? Public or private?
Long-term objectives	Visible elements
Potential obstructions	Objects at arm's reach
	Potential distractions

CROW Customer Context worksheets

I'm making these worksheets available for you to download and use from the Ideaplatz company website.

1. Shared Understanding Baseline
2. Visualizing Context
3. Capturing CROW
4. Open Research Questions





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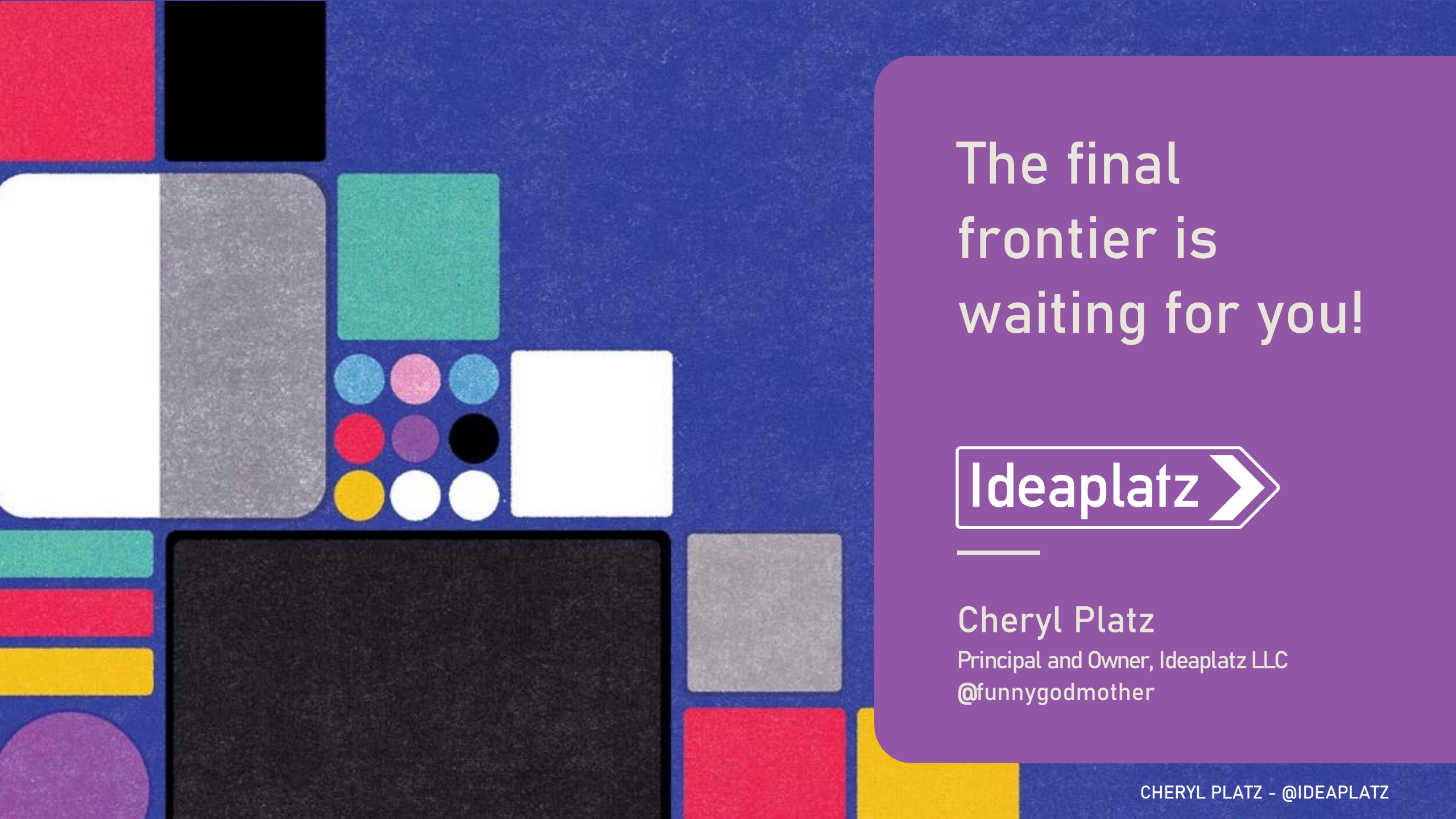
Kindle only: [Amazon in Europe/Japan](#)

Type	Name	Date
Podcast	Quarantine Book Club w/ Erika Hall	December 1, 2020
Virtual Event	CPHUX (Copenhagen UX) Book Club	December 16, 2020
Virtual Workshop	Giving Voice to Your Voice Designs (with Rosenfeld Media, 4 mornings)	January 2021
Virtual Workshop	Capturing Customer Context (Interaction '21)	February 2021
Masterclass	Multimodal Voice Interfaces (UXLx Masters)	February 2021



Upcoming Events

Podcasts and workshops
throughout the winter!



The final
frontier is
waiting for you!



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