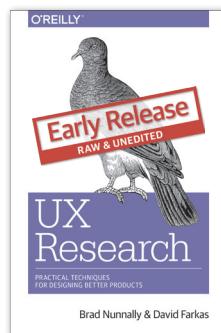
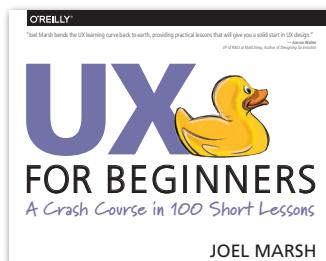
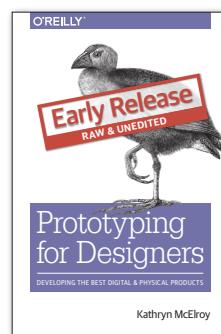
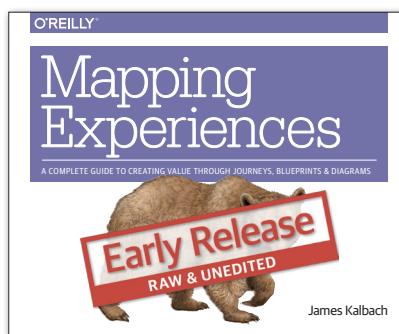


Design Essentials

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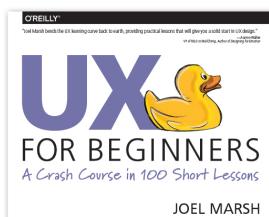
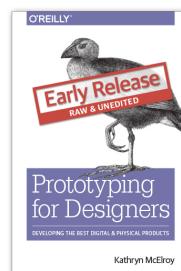
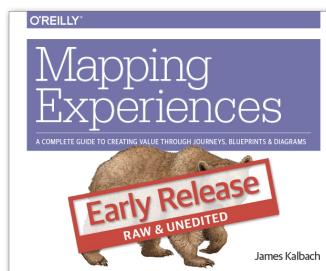
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Guiding users through an app or website without effort or confusion is a critical design skill today, and yet many UX and UI designers still lack the fundamentals necessary to pull it off. What does it take to create products people love? With this free collection of chapters, *Design Essentials* provides a glimpse into some of the published and forthcoming books from the O'Reilly Design Library.

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Chapter 2. Fundamentals of Mapping Experiences

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Prototyping for Designers

[Available soon](#)

Chapter 1. What Is a Prototype?

Mapping Experiences

ALIGNING FOR VALUE



James Kalbach

*“The purpose of visualization
is insight, not pictures.”*

— Ben Shneiderman

Readings in Information Visualization

IN THIS CHAPTER

- Framing the mapping effort
- Touchpoints
- Moments of truth
- Value creation
- Case Study: Identifying Opportunities: Combining Mental Model Diagrams and Jobs to Be Done

Fundamentals of Mapping Experiences

In my first book, *Designing Web Navigation*, I discuss the principle of *transitional volatility*. First described by David Danielson in 2003, transitional volatility is the degree of reorientation a person experiences when moving from page to page in a website. If there is too much volatility, they get lost in hyperspace.

Figure 2-1 shows this pattern of interaction. It's a sequence of becoming accustomed to one location (*habituate*), forming an expectation about the next point (*predict*), and then adjusting to a new position (*reorient*). The pattern then repeats.

We see the same thing happening on a larger scale when individuals interact with an organization. Instead of page to

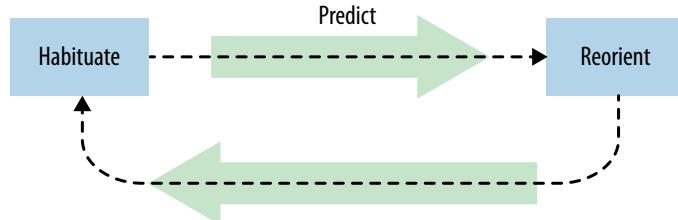


FIGURE 2-1. The pattern of transitional volatility across points of interaction.

page, they move from touchpoint to touchpoint. At each interaction there is a reorientation period, even if brief. If there is too much reorientation at each touchpoint, the experience feels disjointed.

A high degree of transitional volatility arises from an inconsistency in touchpoints. You've probably experienced this yourself. For instance, I once had an unpleasant incident with my credit card. The card issuer and the bank backing it seemed to disagree about who was responsible for my problem. Each blamed the other, and I got caught in the middle.

My experience spanned months and used various means of communication. For some things I used their website; for others I had to call. There were emails, regular mail, and even a fax. The degree of reorientation at each point was high. Apparently it was my job to figure it all out. Needless to say, they no longer have my business and I will not recommend them.

The advice is clear: don't force people to bridge gaps of your offering. That's your job. Mapping experiences allows you to locate transitional volatility within a broader system of interactions and find innovative solutions to address it.

This is not to say, however, that you must design every touchpoint. That would be futile. Some aspects will be beyond your control. However, understanding multiple factors that make up an experience allows you to determine which parts to focus on as well as how to avoid negative experiences, even if beyond your control.

What's more, the aim isn't for uniformity across the board. Rather, strive for *coherency* in the conception and design of the overall system. Create a balanced perception of your organization, but still give people control to shape their own experiences.

Diagrams provide a systematic overview of the experiences you create. By fostering conversations across the organization, the process of mapping helps avoid negative transitional volatility and promote coherency. Regardless of the specific diagram type you create, there are overarching aspects to consider in mapping experience, covered in this chapter. These include:

1. Frame the effort clearly up front. Determine the point of view, scope, focus, and structure of the diagram, as well as how you intend to use it.
2. Identify the various *touchpoints* in the system, as well as critically charged points, called *moments of truth*.
3. Focus on creating value. Use the diagram to improve and to innovate your offering and your business.

By the end of this chapter, you should have a greater understanding of the key decisions you'll have to make when mapping experiences.

Frame the Mapping Effort

The term *experience* defies precise definition. Still, we can point to some common aspects to better understand it:

Experiences are holistic.

The notion of an experience is by its nature all-encompassing, including actions, thoughts, and feelings over time.

Experiences are personal.

An experience is not an objective property of a product or service; it's the subjective perception of the individual.

Experiences are situational.

I like rollercoasters, but not immediately after eating a large meal. In one case, the experience is exhilarating; in the other, it's a dreadful few minutes of nausea. The rollercoaster didn't change, the situation did. Experiences differ from situation to situation. Circumstance drives experience more than disposition.

How, then, do we approach mapping experiences? Put simply, it's a matter of selection. Maps are purposefully focused. As the mapmaker, it's up to you to decide which aspects to include and which to leave out.

Cartographic maps, for instance, are selective in what they show. Consider Harry Beck's famous map of the London Underground, first published in 1933 (Figure 2-2). It is sparing in what it includes: tube lines, stops, exchanges, and the River Thames—nothing more.



FIGURE 2-2. Harry Beck created his iconic map of the London Underground in 1933.

This map also distorts the train lines, relying only on horizontal, vertical, and 45-degree angled lines. Stops are spaced equidistantly as well, when in reality the distances vary greatly.

Beck's map has remained virtually intact for over 70 years with only minor updates. Its brilliance lies in what it *doesn't* show: streets, buildings, curves in lines, and actual distances between stops. The longevity of Beck's map is given by its appropriateness—it fulfills a specific need extremely well.

Likewise, mapping experiences requires choice: what to include and how to represent it. For now, it's important to understand the aspects that frame mapping efforts: point of view, scope, focus, structure, and how a diagram will be used.

Point of View

Mapping experiences requires a common thread or a "bounding ball" to follow. The point of view of a diagram should answer the question, what is it about?

Point of view is given by two criteria: the people involved and the types of experiences focused on. For instance, a news magazine might serve two distinct audiences: readers and advertisers. The interactions each has with the publisher are very different. Whose experience you illustrate depends on the goals of the organization.

Once you've decided on the people to focus on—assume readers in this example—there are different experiences to choose from. Consider these three potential experiences for a news magazine reader:

Purchasing behavior

One point of view is to look at how readers *purchase* the news magazine: how they first hear of the magazine, why they bought it, if they make a repeat purchase, and so on. Mapping an experience from this point of view makes sense if there is a need to optimize sales. A customer journey map would be a good fit.

News consumption

Another point of view might be to look at how readers *consume* news in general. This would situate the magazine within a broader spectrum of human information behavior. This point of view could be beneficial if the magazine is looking to expand its offering. A mental model diagram could be useful in this case.

Day-in-the-life

You could also look at a *day-in-the-life* of typical readers: how does a news magazine fit into their daily actions? Where do they come in contact with the magazine? When? What else do they do to find and read news? An experience map may be appropriate for mapping this experience.

Each of these points of view has a different unit of analysis—purchasing, consuming news, or a daily routine. And each can be beneficial depending on the needs of the organization.

Typically, focus a given diagram on single point of view in a given diagram. A clear perspective generally strengthens the message of a diagram.

To compare different points of view, you could create several individual diagrams and display them together—for instance,

by hanging them next to each other on a wall. But it's also entirely possible to include multiple people and multiple experiences within the same diagram. This provides an overview of the complete service ecosystem. If you do, just be clear about how different points of view come together. In the end, it's the mapmaker's job to determine which points of view to follow.

Scope

The equally spaced Tube stops on Beck's map of the London Underground allow the entire system to fit on one page. Actual spacing would have put the end stations far off the page. Given his scope—to show the entire system—this lack of fidelity is necessary.

Scope requires tradeoff in breadth versus depth. A map of an end-to-end experience reveals the big picture but leaves out detail. On the other hand, a detailed diagram may illustrate specific interactions, but cover less ground. Determine the boundaries of the experience and the granularity needed to tell a complete story.

As the mapmaker, it's up to you to decide which aspects to include and which to leave out.

For example, imagine you've been contracted by the tourist bureau of a city in the US to improve the experience of visiting tourists, with a specific goal of increasing the mobile services offered.

One approach could be to scope the entire visit starting from planning at home, to visiting the city, and all the way to follow-up actions afterwards. This would give you a broad picture across different touchpoint types across the entire service ecology for multiple stakeholders.

In another approach, you could limit the effort to only experiences in the city with mobile services. This journey might begin and end at the airport or train station, but would provide greater depth on mobile touchpoints for a particular user type.

Both approaches are valid depending on the needs of the organization, as well as their interests and gaps in knowledge. Are you focused on a discrete problem or do you need a view of the entire system? The point is to be explicit about the tradeoffs you're making upfront and set the right expectations.

Focus

The mapmaker also chooses which aspects come to the foreground. There are many types of elements to consider. The ones you choose depend on how you've framed the effort (see Chapter 4) and what aspects are most salient to the organization.

In describing the individual's experience you might include some of the following typical aspects:

- **Physical:** artifacts, tools, devices
- **Behavioral:** actions, activities, tasks
- **Cognitive:** thoughts, views, opinions
- **Emotional:** feelings, desires, state of mind
- **Needs:** goals, outcomes, jobs to be done
- **Challenges:** pain points, constraints, barriers
- **Context:** setting, environment, location
- **Culture:** beliefs, values, philosophy
- **Events:** triggers, moments of truth, points of failure

Elements that describe the organization can include:

- **Touchpoints:** mediums, devices, information
- **Offering:** products, services, features
- **Processes:** activities, workflow
- **Challenges:** problems, issues, breakdowns

- **Operations:** roles, departments, reporting structures
- **Metrics:** traffic, financials, statistics
- **Evaluation:** strengths, weaknesses, learnings
- **Opportunities:** gaps, weaknesses, redundancies
- **Goals:** revenue, savings, reputation
- **Strategy:** policy, design making, principles

The question of balance of the above elements comes into play as well. For instance, a customer journey map may focus primarily on an experience with only a minimal description of the organization. A service blueprint, on the other hand, may highlight the service provision process across channels at the expense of a detailed description of the user experience.

Structure

Alignment diagrams differ in structure. The most common scheme is chronological (Figure 2-3a), and many of the examples in this book have a chronological organization. However, other arrangements are possible, including hierarchical, spatial, and network structures (Figures 2-3b, 2-3c, 2-3d).

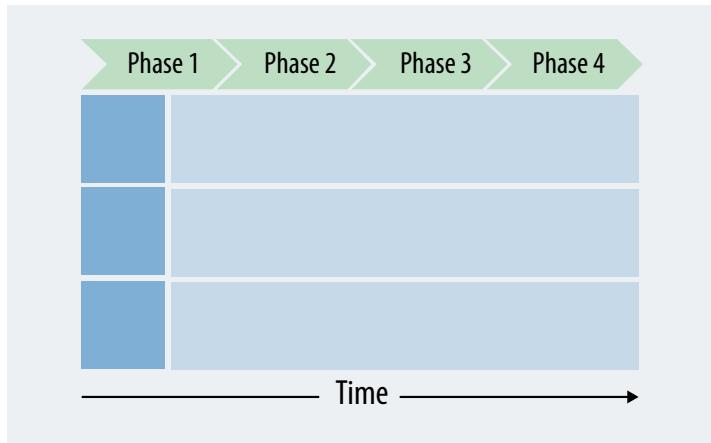


FIGURE 2-3a. CHRONOLOGICAL: Because experiences happen in real time, a chronological arrangement provides a natural sequence of human behavior. A timeline of some sort is the most prevalent way to structure alignment diagrams. See Chapters 9 to 11 on service blueprints, customer journey maps, and experience maps for more.

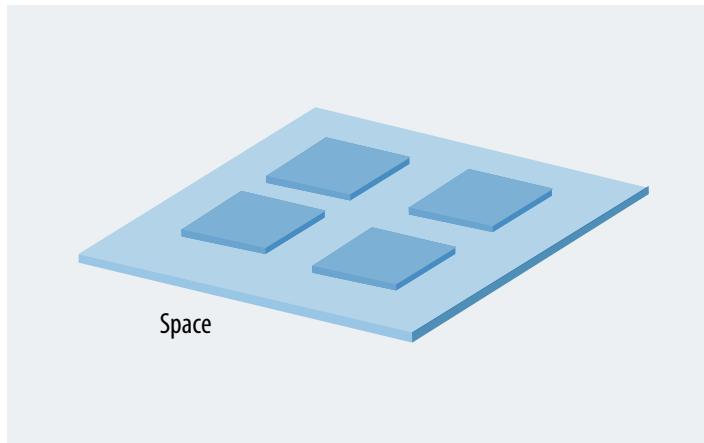


FIGURE 2-3c. SPATIAL: It's also possible to illustrate experiences spatially. This makes sense when interactions take place in a physical location—for example, in a face-to-face service encounter. But they can also be imposed on an experience in a metaphorical sense: spatial maps represent experiences as if they could exist in a 3D space even when they do not. Chapter 13 discusses spatial maps in greater detail.

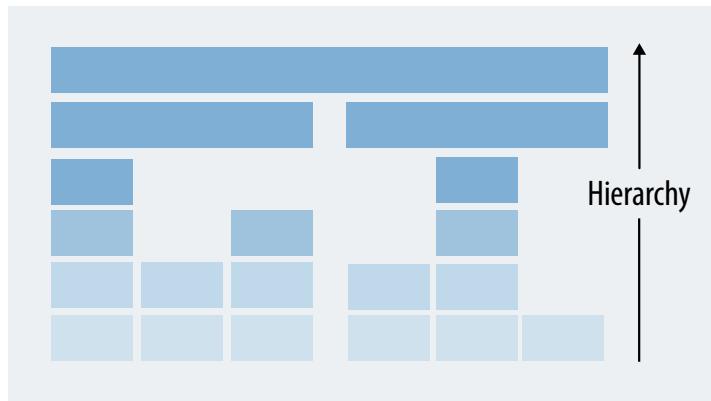


FIGURE 2-3b. HIERARCHICAL: Mapping experiences hierarchically removes the time dimension. This can have advantages when there are many aspects occurring simultaneously, which is difficult to show chronologically. Chapter 12 discusses mental model diagrams and other hierarchical arrangements.

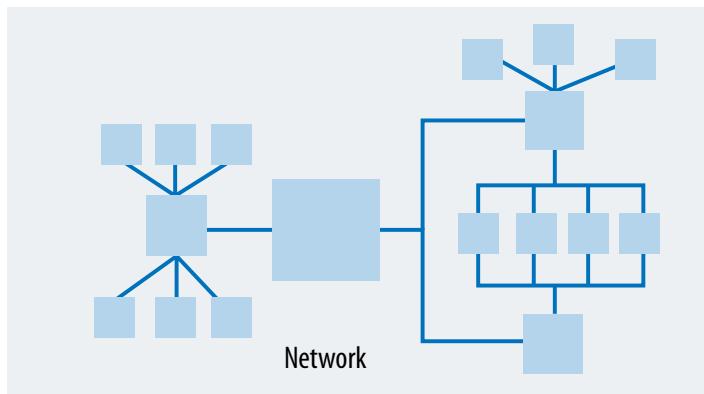
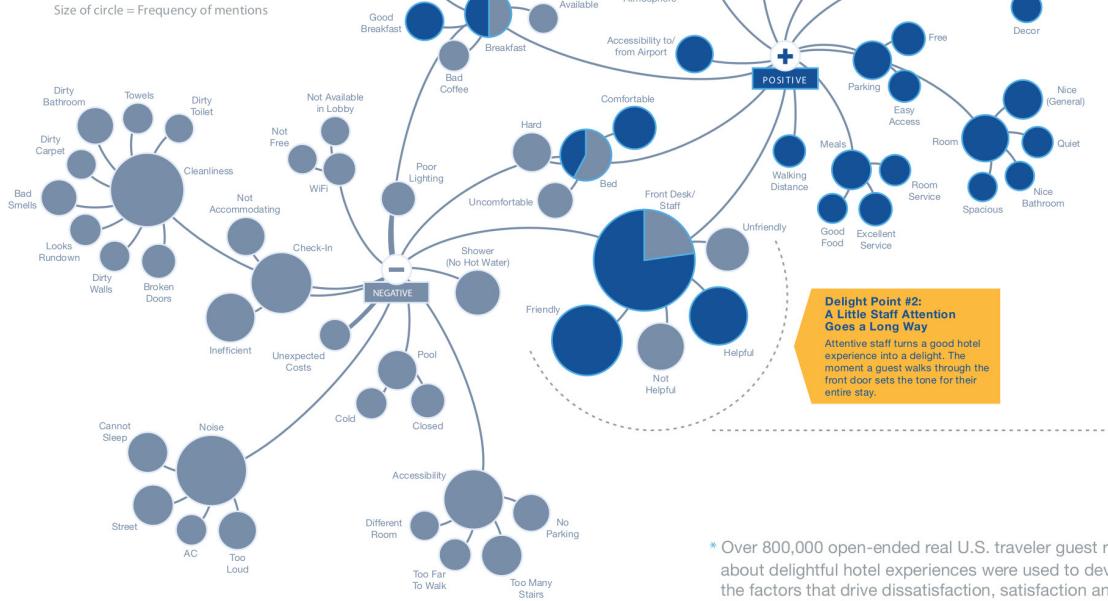


FIGURE 2-3d. NETWORK STRUCTURE: A network structure shows a web of interrelationships between aspects of an experience that are neither chronological nor hierarchical.

Booking.com

A COMPREHENSIVE MAP OF THE GUEST EXPERIENCE

- Points of satisfaction
 - Points of dissatisfaction
 - Points of both satisfaction and dissatisfaction
 - Points of Delight
- Size of circle = Frequency of mentions



Delight Point #4: Good Location + Adventure = A Memorable Experience

Hotels that help guests to take full advantage of their locations and amenities to enjoy new adventures leave them with the best memories of their stay.

Delight Point #1: The Total Package

Whether for business or pleasure, guests say that they only truly relax and enjoy their stay when they have confidence that they can hand over all aspects of their stay to the "hotel that does it all."

Delight Point #3: Falling in Love

A coup de cœur always ensures repeat business. Accommodations that have that something extra that guests can fall in love with get the most applause from guests.

Delight Point #5: Discovering Something New

Travel has always meant opening up to new experiences. The hotel that helps its guests discover new things delivers the most delight for travelers.

Delight Point #6: Beyond Family Friendly

Family friendly is par for the course these days. Guests favor hotels that are "family supportive" and foster quality togetherness.

Delight Point #2: A Little Staff Attention Goes a Long Way

Attention to detail turns a good hotel experience into a delight. The moment a guest walks through the front door sets the tone for their entire stay.

* Over 800,000 open-ended real U.S. traveler guest reviews and 1,200 stories about delightful hotel experiences were used to develop this visualization of the factors that drive dissatisfaction, satisfaction and delight during a hotel or accommodation stay.

FIGURE 2-4. A network-like arrangement of actors and concepts shows positive and negative experiences with Booking.com.

Figure 2-4 is an example of the guest experience of the service Booking.com. It's an excellent example of illustrating an experience in network-like structure. The focus is on touchpoints that lead to positive or negative experiences.

Use

Keep the intended use of an alignment diagram in mind from the very beginning.

First, consider *who* will be consuming the information in your diagram. The London Underground map is read by everyday travelers on the Tube. They use it to determine how to travel between any two points on the network. But the engineers who maintain the switching signals in the London Underground would likely find Beck's map lacking in detail. They need specifications with a much higher degree of fidelity to accomplish their work. Beck's map is not intended for that audience.

Also consider *what* you'll use diagrams for. Frame the effort in a way that is appropriate for your team's needs. What questions does the organization have that a diagram can address? What gaps in knowledge does it fill? What problems will it help solve?

Finally, ask yourself *how* the diagram will be used. Will they be used to diagnose problems or improve the design of an existing system? Will they be used to create a strategy and plan for development? Or does your audience intend to use the alignment diagram to discover new opportunities for innovation and growth?

Keep in mind that the goal of a mapping effort isn't to complete an artifact, but to address the challenges the diagrams help discover and understand. Diagrams are compelling documents that invite engagement by others. Use this to your advantage to find ways of solving customer problems and creating value.

Identify Touchpoints

Framing the effort, as outlined above, provides a basis for illustrating the overall experience. Within that experience, you also need to consider the relationship between individuals and an organization. The concept of *touchpoints*, the means of value exchange, allows you to show the interaction between the two.

Typically, touchpoints include a range of things, such as:

- TV ads, print ads, brochures
- Marketing emails, newsletters
- Website, apps, software program
- Phone calls, service hotline, online chat
- Service counter, checkout register, consulting
- Physical objects, buildings, roads
- Packaging, shipping materials
- Bills, invoices, payment systems

Historically, there are three primary types of touchpoints:

Static

These touchpoints don't allow for users to interact with them. They include things such as an email newsletter or an advertisement.

Interactive

Websites and apps are interactive touchpoints, as are online chats.

Human

This type involves human-to-human interaction. Examples include a sales representative or a support agent on the phone.

Consider the inventory of touchpoints in Figure 2-5. This diagram was created by the Swiss-based marketing firm Accelerom, an international consultancy and research firm based in Zurich (www.accelerom.com), as part of their 360° touchpoint management process.* This shows a fairly comprehensive list of touchpoints a company has with its customers.

Notice that the touchpoints are grouped by channel in Figure 2-6—in this case, point of sale, one-to-one, indirect, and mass communication. A channel is not a touchpoint but rather a category of touchpoint given by the mode of delivery.

Diagrams are compelling documents that invite engagement by others.

Inventories such as the one in Figure 2-5 are necessary to get a comprehensive overview of touchpoints. But some people call for a broader perspective. Chris Risdon, for one, defines a touchpoint as the *context* around an interaction. In his article "Unsucking the Touchpoint" he writes:

A touchpoint is a point of interaction involving a specific human need in a specific time and place.

Jeanie Walters, a leading customer experience consultant, also advocates a broader definition. She is critical of touchpoint inventories, writing:

The challenge with viewing touchpoints this way is this approach often assumes the customer has a) been in a linear and direct relationship with the organization and b) reads and engages with these touchpoints in meaningful ways. In short, an examination of touchpoints is often entirely company-focused. (Sometimes, it is so company-focused the touchpoints are categorized by org chart: marketing; operations; billing, etc.).

* See Christoph Spengler, Werner Wirth, and Renzo Sigrist. "360° Touchpoint Management – How important is Twitter for our brand?" *Marketing Review St. Gallen* (Feb 2010).

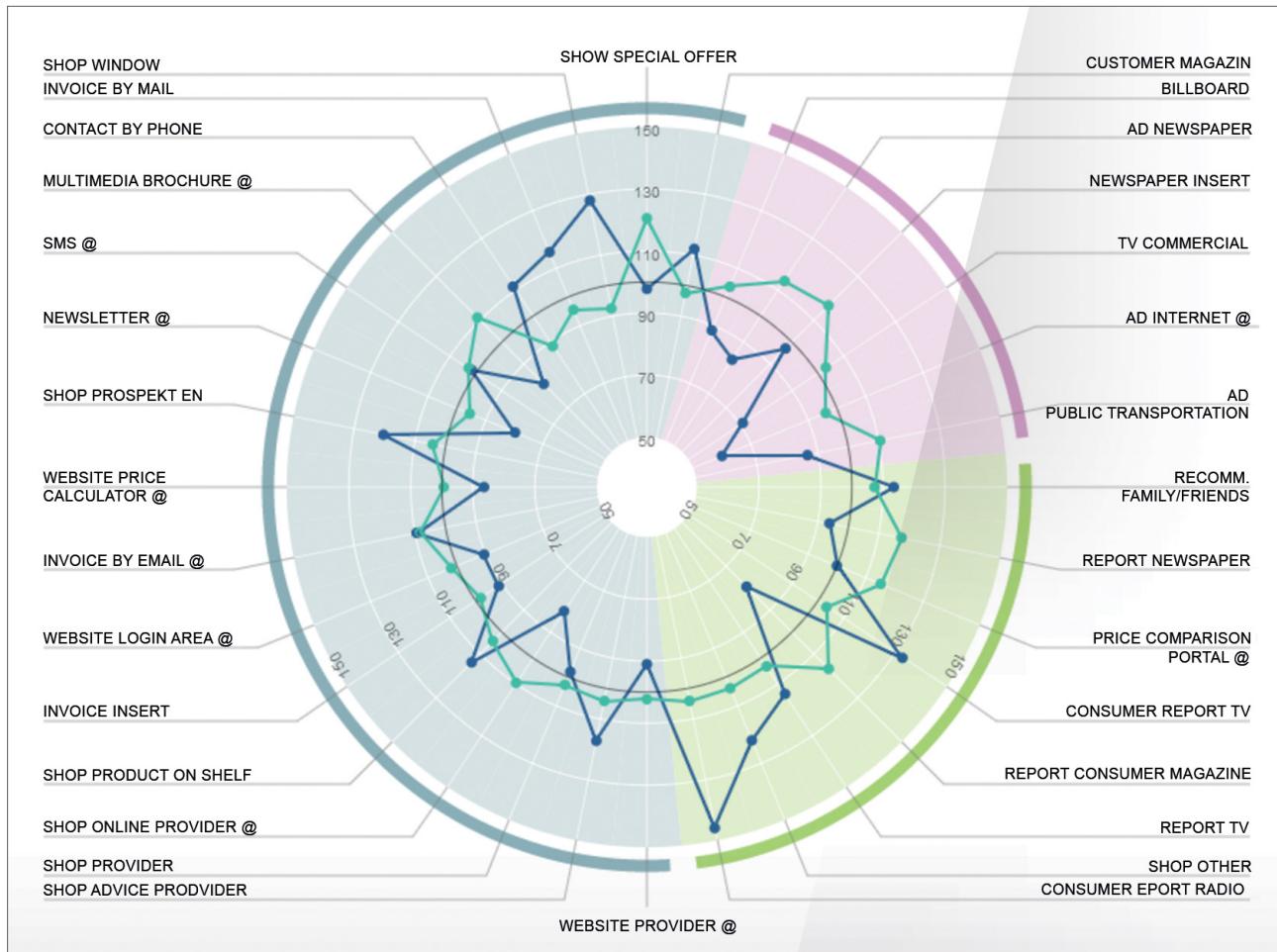


FIGURE 2-5. This is an example of a 360° touchpoint matrix created by the Swiss firm Accelerom.

PHOTOGRAPHY / CONNECTING THE DOTS

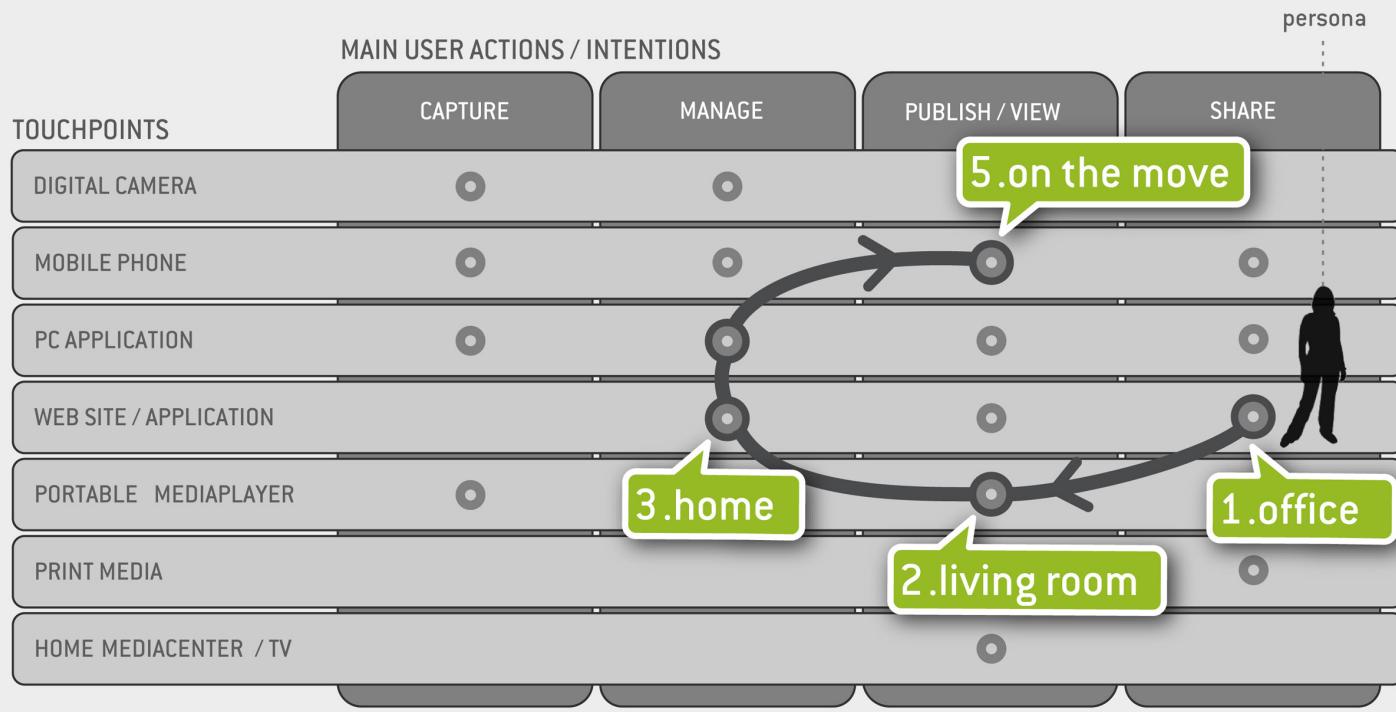


FIGURE 2-6. This touchpoint matrix for photography created by Gianluca Brugnoli shows a sequence of interactions.

In Gianluca Brugnoli's article "Connecting the Dots of User Experience," he offers the touchpoint matrix shown in Figure 2-6. This diagram illustrates various activities around photography. By providing a sequence and locations of interactions, Brugnoli provides context for touchpoints in a journey.

Brugnoli believes that the system is the experience. It's the sum of all touchpoints, as well as the connections between them. He writes:

The challenge that logically follows is to design connections. In the system scenario, design should be mainly focused on finding the right connections within the network and its parts, rather than in creating closed and self-sufficient systems, tools and services.

Creating value in the 21st century will increasingly involve systems of experiences. Touchpoints are the basic building blocks that make up the system.

Organizations that take an ecological view on the experiences they provide have a competitive advantage. For businesses, this impacts the bottom line. One study from 2013 by Alex Rawson and colleagues found that optimization across touchpoints was a strong predictor of business health.* The researchers found a 20% to 30% correlation with improved outcomes, such as higher revenue, better retention, and positive word of mouth.

Alignment diagrams reinforce such an ecological view of the interaction with customers. They not only illustrate individual

* See Alex Rawson, Ewan Duncan, and Conor Jones. "The Truth About Customer Experience" *Harvard Business Review* (Sep 2013).

touchpoints but also provide an end-to-end picture of the experience.

Moments of Truth

Alignment diagrams are not just a collection of touchpoints. They also provide insight for identifying and understanding critical points in the experience. Called *moments of truth*, these key, emotional instances help focus attention on the aspects that matter most.

Moments of truth can be thought of as a special type of touchpoint. They are critical, emotionally charged interactions, and usually occur when someone has invested a high degree of energy in a desired outcome. Moments of truth either make or break the relationship.

The term *moments of truth* was popularized by Jan Carlzon, the then CEO of SAS Airlines, in his book of the same name. To illustrate his point, Carlzon starts his book with a story of a customer who arrived at the airport without his boarding pass. The SAS agents personally drove back to the hotel where he left it and delivered it to him at the airport. This left an indelible impression on the customer.

Or, consider something as simple as Twitter's infamous "fail whale." Now retired, the fail whale was an image of a whale (Figure 2-7) that appeared when Twitter servers were overloaded. Though disruptive at a critical moment—the point at which a person is posting a tweet—many people actually felt an emotional connection to the fail whale. Twitter turned a potentially negative moment of truth into something positive.

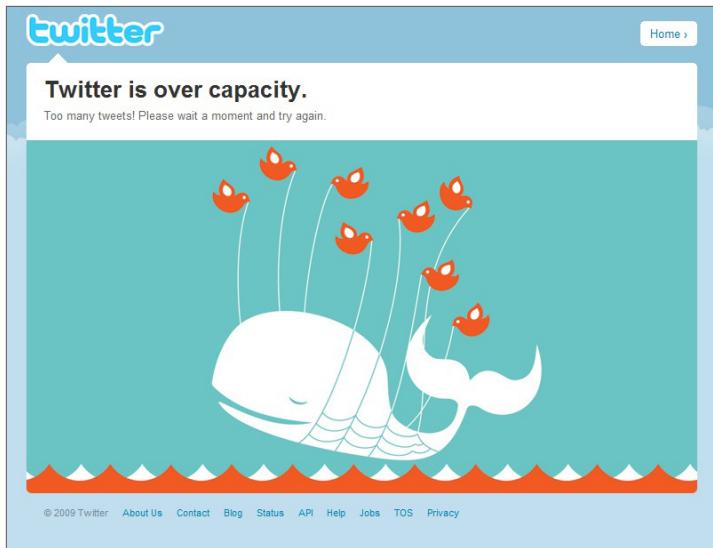


FIGURE 2-7. Twitter's now-retired fail whale turned a potentially negative moment of truth into a potentially delightful experience.

Moments of truth point to opportunities for innovation and growth. For instance, in their book *The Innovator's Method*, business scholars and consultants Nathan Furr and Jeff Dyer suggest creating what they call "journey lines," or a brief visualization of the steps customers take. They write:

Create an in-depth visual portrait in which you identify pain points to understand how your customers do the job today and how they feel while doing it. Visually map out the steps customers take to achieve an outcome. It helps to assign a customer emotion to each step to identify how the customer is feeling.

Creating value in the 21st century will increasingly involve systems of experiences. Touchpoints are the basic building blocks that make up the system.

They go on to recommend looking for moments "that ignite their emotions"—in other words, moments of truth. Solutions that address these moments, they claim, are more likely to be monetizable: people are generally willing to pay for services that address critical needs. In this sense, moments of truth are points of opportunity for the organization.

The individual's perception of an organization is given by the sum of all moments of truth. These may be moments of delight—positive interaction after positive interaction. On the negative side, the relationship may suffer from a "death by a thousand cuts."

Focusing on moments of truth allows you to concentrate your energy on experiences that matter. The perceived coherency of your offering is given by how you handle moments of truth. Diagrams provide insight into these points across time, allowing organizations to design a more cohesive experience and reduce transitional volatility.

Zero Moment of Truth

Traditionally, there are three main touchpoint types in commerce situations.

- *Stimulus*: the very first time customers become aware of a given product or service.
- *First moment of truth*: the decision to buy a product or service.
- *Second moment of truth*: the first experience customers have using a product or service.

More and more, consumers read reviews by other consumers. They look at sites like Amazon to inform decisions. Or, they ask Twitter followers for opinions. And they look at who's behind a service as well, researching profiles on LinkedIn and even Facebook. Regardless of industry or sector, customers are far more informed today than just a decade ago.

In addition to the first and second moments of truth, market researchers at Google have identified a new critical touchpoint: the "Zero Moment of Truth," or ZMOT for short.* It falls between the stimulus and the decision to buy (Figure 2-8).

Content is critical at the ZMOT. But it can't come across as marketing fluff: information at the ZMOT touchpoint must be meaningful and valuable. Successful companies converse with their markets and engage in a dialog. They position themselves not as "buy me!" banners, but as trusted advisors.

Notice that product recommendations feeding into the ZMOT come after someone has already used a product. With this, the usage experience is now relevant before the purchase decision.

More importantly, people increasingly find meaning in the products and services they buy during the ZMOT. They want to know about the company and the people behind an offering. They want to know how it fits into their value system and how it will define them personally.

You may rightfully point out that people have always engaged in conversations with brands. Markets are conversations indeed. What's different now is a combination of the breadth of content available and the speed at which consumers can access it. Now, it's expected that a customer researches various aspects of your business before even coming in direct contact with you or your offerings.

In any event, the various parts of a product or service experience are now much more interrelated than they were just a decade ago. A holistic mindset is needed to connect moments of truth and design meaningful experiences for people.

* Jim Lecinski. *ZMOT: Winning the Zero Moment of Truth* (Google, 2011).

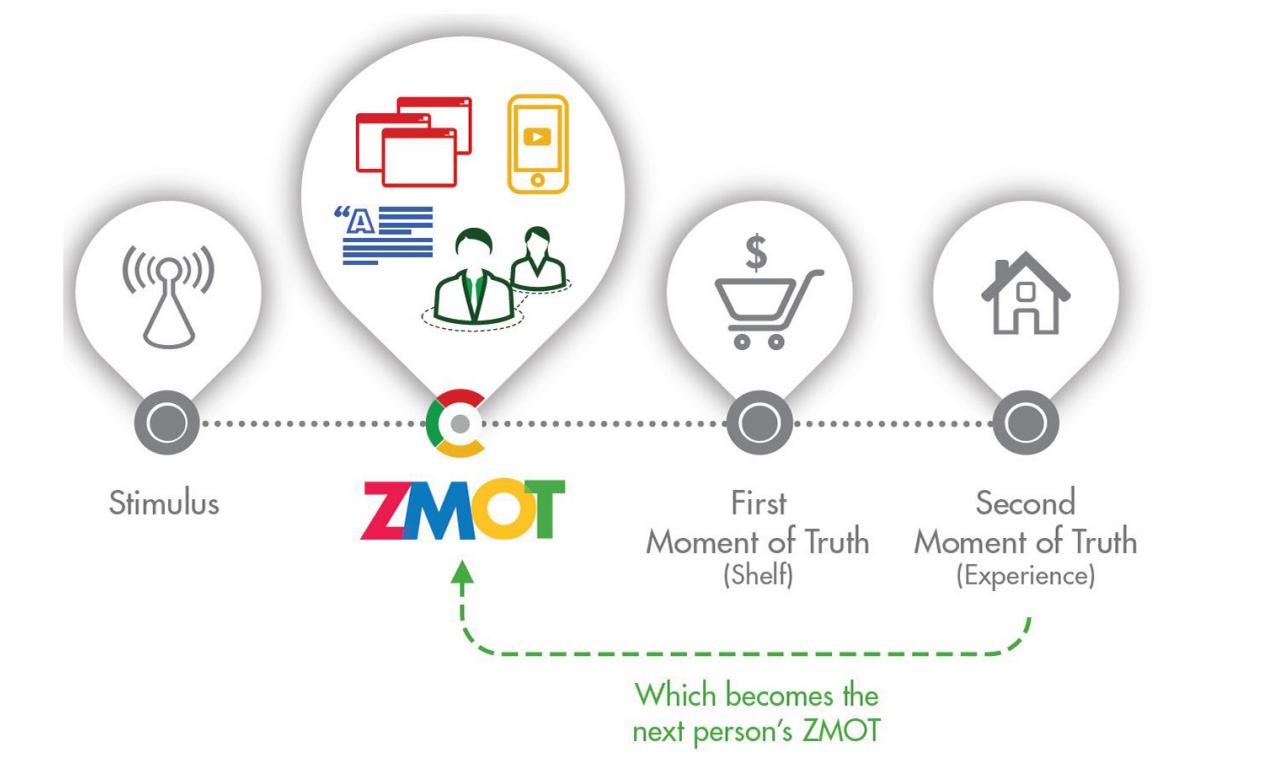


FIGURE 2-8. Zero Moment of Truth, a new phase in consumer behavior, was introduced by researchers at Google.

Focus on Creating Value

Business magnate Warren Buffet once said, “price is what you pay, value is what you get.” In other words, from the individual’s perspective value is a much richer, more dynamic concept than cost, involving human behavior and emotions. Value is a *perceived benefit*.

Existing frameworks help us understand the subjective nature of the concept. Sheth, Newman and Gross* identify five types of customer value:

- *Functional value* relates to the ability to perform a utilitarian purpose. Performance and reliability are key considerations with this type of value.
- *Social value* refers to the interaction among people, emphasizing lifestyle and social awareness. For instance, Skype in the Classroom is a program aimed at inspiring students with prominent speakers who lecture from remote locations.
- *Emotional value* emphasizes the feelings or affective responses a person has while interacting with an organization’s offerings. For example, personal data security services tap into the fear of identity theft or data loss.

- *Epistemic value* is generated by a sense of curiosity or a desire to learn. This type of value emphasizes personal growth and the acquisition of knowledge. The Khan Academy, for instance, provides online courses for people to learn at their own pace.
- *Conditional value* is a benefit that depends on specific situations or contexts. For instance, the perceived value of pumpkins and monster costumes increases conditionally just before Halloween in the US each year.

Beyond these types, design strategist and educator Nathan Shedroff points to *meaning* as forms of what he calls “premium value.”[†] This exceeds mere novelty and delight, and looks at the purpose products and services have in our lives. Products and services that provide meaningful experiences help us make sense of the world and give us personal identity.

Together with coauthors Steve Diller and Darrel Rheas Shedroff identifies 15 types of premium value in the book *Making Meaning*:

1. *Accomplishment*. The sense of pride in achieving goals
2. *Beauty*. The appreciation of aesthetic qualities that give pleasure to the senses
3. *Community*. A sense of connectedness with others around us

* Jagdish Sheth, Bruce Newman, and Barbara Gross. *Consumption Values and Market Choices* (South-Western Publishing, 1991).

[†]See Nathan Shedroff’s talk at Interaction South America on the topic of design and value creation: “Bridging Strategy with Design: How Designers Create Value for Businesses” (Nov 2014), <http://bit.ly/1WM0410>.

4. *Creation*. The satisfaction of having produced something
5. *Duty*. The satisfaction of having fulfilled a responsibility
6. *Enlightenment*. The gratification of learning about a subject
7. *Freedom*. A sense of living without constraints
8. *Harmony*. The pleasure of balance between parts of a whole
9. *Justice*. The assurance of just and fair treatment
10. *Oneness*. A sense of unity with people and things that surround us.
11. *Redemption*. Deliverance from past failure
12. *Security*. A freedom from worry about loss
13. *Truth*. A commitment to honesty and integrity
14. *Validation*. External recognition of one's worth
15. *Wonder*. Experiencing something beyond comprehension

Diagrams illuminate the human dynamics of value creation at all levels. They embrace the subjective nature of value and provide organizations an outside-in view to the value they actually create.

As a class of documents, alignment diagrams foster value-centered design. They allow you to visualize and locate value within your offering ecosystem. From this you can ask, what is your value proposition at each point in the experience? Or, how is the organization meaningfully unique from the customer's perspective? And, what meaning can you create for customers?

Jobs to Be Done

The concept of *jobs to be done* provides a lens through which to understand value creation. The framework looks at customer motivations in business settings. When we map experiences, we are effectively mapping jobs to be done.

The term was made popular by business leader Clayton Christensen in his book *The Innovator's Solution*, the follow-up to his landmark work *The Innovator's Dilemma*. It's a straightforward principle: people "hire" products and services to get a job done.

For instance, you might hire a new suit to make you look good at a job interview. Or, you hire Facebook to stay in touch with friends on a daily basis. You could also hire a chocolate bar to relieve stress. These are all jobs to be done. For each job, there are three dimensions to consider:

Functional job

The practical task at hand to meet a person's requirements.

Emotional job

The feelings a person desires while completing a job.

Social job

How a person believes he or she will be perceived socially while using the solution.

Typically, a job to be done is expressed in terms of its functional jobs. As a result, many people assume the technique is nothing more than task analysis or a list of use cases. This is a fallacy. Jobs to be done are ultimately about an underlying need and desired outcomes.

Value is a much richer, more dynamic concept than cost involving human behavior and emotions.
Value is a perceived benefit.

For instance, a homeowner may buy a digital keyless lock for their front door. The desired outcome is to reduce the chance that an intruder can enter their home. But there's also an emotional job: to increase the homeowner's sense of safety and security. Socially, the digital lock also fulfills the jobs of letting invited guests in and out as desired.

Viewing value creation in this way shifts focus from the psycho-demographic aspects of individuals to their goals and motivations. It's not about the user but about usage.

Finally, the context of the job is critical to understand. Christensen writes:

*Companies that target their products at the *circumstances* in which customers find themselves, rather than at the *customers* themselves, are those that can launch predictably successful products. Put another way, the critical unit of analysis is the *circumstance* and not the customer.*

Alignment diagrams describe those circumstances—the broader context of goals, desired outcomes, and emotions, as well as constraints and pain points. Mapping experiences illustrates conditions of jobs to be done in an holistic way for everyone in an organization to learn from.

Summary

The concept of *transitional volatility* in web navigation serves as an analogy for the experiences people have when moving from touchpoint to touchpoint of a provider. If individuals have to constantly reorient themselves, the experience feels incoherent. Coherency in experience is a common goal for most organizations, and has been shown to increase profits.

But experiences are frustratingly intangible and overwhelmingly broad. As the mapmaker, it's your job to frame the diagram and experiences you'll be mapping. This includes decisions about the perspective, scope, focus, structure, and use. Chapter 4 discusses the process of selection in more detail.

Touchpoints are the means by which an interaction between individuals and an organization can take place. Typically, these are seen in terms of interaction with an advertisement, applications, websites, a service encounter, and a phone call.

A broader definition of touchpoints, however, sees them as the context in which they occur. The interaction between an individual and an organization happens at a given time and within a given environment. Organizations that design for and manage coherency across touchpoints see enormous benefits: greater satisfaction, stronger loyalty, and larger returns.

Moments of truth are critical, emotionally intense moments. They are those instances that make or break a relationship. Looking for the moments of truth gives points to potential opportunities for innovation.

From the individual's perspective, value is subjective and complex. There are many types of value they may consider: functional, emotional, social, epistemic, and circumstantial. Premium value goes beyond these types to include meaning and identity.

Jobs to be done is an existing framework that helps view value from an individual's standpoint. Popularized by Clayton Christensen, the practice looks at why people "hire" products and services to reach a desired outcome.

Further Reading

"Adaptive Path's Guide to Experience Mapping" (2013) <http://mappingexperiences.com>

This is a free guide to experience mapping from the good folks at Adaptive Path. In less than 30 pages they are able to describe the mapping process with clarity. This includes an excellent discussion of the advantages of experience mapping in general.

Gianluca Brugnoli, "Connecting the Dots of User Experience," *The Journal of IA* (Spring, 2009)

This is a well-referenced article on cross-channel design. Gianluca provides some practical tips on how to map systems. The highlight of the article is his customer journey matrix. He observes: "The user experience takes shape on many interconnected devices and through various interfaces and networks used in many different context and situations."

Harvey Golub et al. "Delivering value to customers," *McKinsey Quarterly* (Jun 2000)

This is an excellent summary of articles from the prior three decades on the creation and delivery of customer value. It highlights the work of McKinsey employees with references to their respective full articles on the subject.

Marc Stickdorn and Jakob Schneider. *This Is Service Design Thinking: Basics-Tools-Cases* (BIS Publishers, 2012)

This is a collection of chapters by leaders in the service design field. It includes many diagrams and descriptions of tools, many of which are mapping exercises. This is a comprehensive book on service design that belongs on every designer's desk.

Identifying Opportunities: Combining Mental Model Diagrams and Jobs to Be Done

by Jim Kalbach, with Jen Padilla, Elizabeth Thapliyal, and Ryan Kasper

A key challenge in product development is selecting areas of improvements and innovation to focus on. A solid theory is needed to connect user insights to development decisions.

To that end, the GoToMeeting user experience design team at Citrix embarked on efforts to provide actionable needs-based insight for product development. The approach combined mapping out user behaviors and motivations through a mental model diagram and prioritizing the users' needs using the "jobs to be done" theory. This provided a visual map of the landscape as well as directions on how to create value to their customers.

The overall process had six steps:

1. Conduct primary research.

We started with contextual inquiry. Broadly looking at the domain of work collaboration and communication, we conducted over 40 on-site interviews. Stakeholders and team members were included in the interviewing process.

Data collection included field notes, photos, audio recordings, and video. A third-party vendor transcribed all of the over 68 hours of audio recordings. This resulted in nearly 1,500 pages of text.

1. Create a mental model diagram.

Following Indi Young's approach closely, we analyzed the transcriptions for the jobs people were trying to get done. Through an iterative process of grouping, we created the mental model diagram. This is a bottom-up approach that entails clustering individual findings into themes, which are in turn grouped into categories.

Fundamental goals and needs began to emerge. The result was illustration of "work collaboration" based directly on field research.

The process also included the mapping of current products and features that support customer goals and needs. This allowed the team to see how our current offerings fit into a customer's mental model.

2. Hold a workshop.

In a workshop with approximately 12 stakeholders from various departments, we read through the diagram in breakout groups. Each group got about a third of the overall mental model to work with. The goal was to have stakeholders first empathize with the current user experience (Figure 2-9).



FIGURE 2-9. Using a mental model diagram in a workshop with stakeholders. (The author is pictured with expert UX researcher Amber Brown.)

We then brainstormed concepts using scenarios around the “future of work.” To do this, we presented each group with key trends about the future of work taken from industry reports. At each section of the diagram, we posed the question to the group, “If each trend came true, what must we do to support customers and ultimately to evolve as a company?”

To help socialize the outcomes of the workshop, we created an infographic summarizing the main conclusions. We printed this graphic on a single sheet of paper, had it laminated, and sent it by regular mail to workshop participants. A year or more later, it was still possible to see this infographic on teammates’ desks.

2. Map concepts to diagram.

After the workshop, we updated the diagram with comments and input from stakeholders. We then mapped various concepts back to the diagram below the support towers. This resulted in an extended map and composite picture: the user’s experience on the top, the support we currently offer in the middle, and future enhancements and innovations at the bottom (Figure 2-12).

But which gaps in people’s ability to collaborate should we aim to solve first? Jobs to be done (described above) then helped us focus on the concepts with the most potential.

3. Prioritize jobs to be done.

We prioritized the jobs represented in the diagram by two factors:

- The level of importance associated with getting the job done
- The level of satisfaction associated with getting the job done

Graphed on a chart, the jobs that are highly important but least satisfied have the highest chance of customer adoption (Figure 2-10). They fulfill an unmet need.

To find this sweet spot, we employed a specific technique developed by Tony Ulwick. For more on this method, see Ulwick’s writings, listed in the “Further Reading” section.

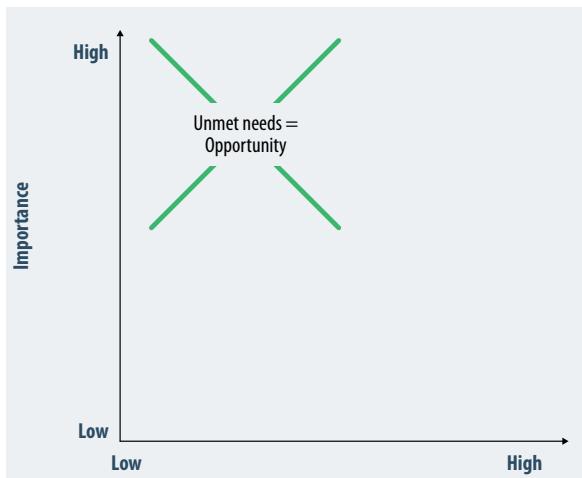
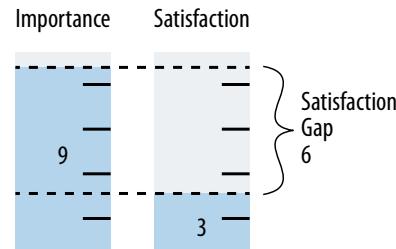


FIGURE 2-10. Solutions that meet unmet needs—or jobs that are important but unsatisfied—have a higher chance of succeeding.

The technique starts with generating so-called desired outcome statements, or the success measures for completing a job successfully. These were based directly on the mental model diagram.

Next, we launched a quantitative survey with the complete set of about 30 desired outcome statements. Respondents were asked to rate each desired outcome statement for both importance and satisfaction.

We then calculated the opportunity score for each statement. We determined this by taking the score for importance and adding the satisfaction gap, which is importance minus satisfaction. For instance, if for a given statement respondents rated importance 9 and satisfaction 3, the result is 15 for the opportunity score ($15 = 9 + (9 - 3)$). See Figure 2-11.



$$\text{Importance} + \text{Satisfaction Gap} = \text{Opportunity Score}$$

$$9 + 6 = 15$$

FIGURE 2-11. Opportunity scores for finding unmet jobs to be done.

Note that this score intentionally focuses on customer opportunity, not financial opportunity or market size opportunity. In other words, we were looking to solve for customer needs that would bring the chance of adoption by customers.

3. Focus innovation efforts.

The tasks in the mental model diagram, the opportunity scores, and proposed concepts were visually aligned, providing a clear picture of the opportunity space (Figure 2-12).

Efforts were prioritized against this information. This gave the team confidence that we were moving in the right direction—one that was firmly grounded in primary insights.

Product managers, marketing managers, and engineers found the information useful to their work. The prioritized list of people's needs turned out to be a highly consumable format for teams to engage with the research. One product owner said: "It's great to have this data to help make informed decisions. I'm looking forward to incorporating it more and more."

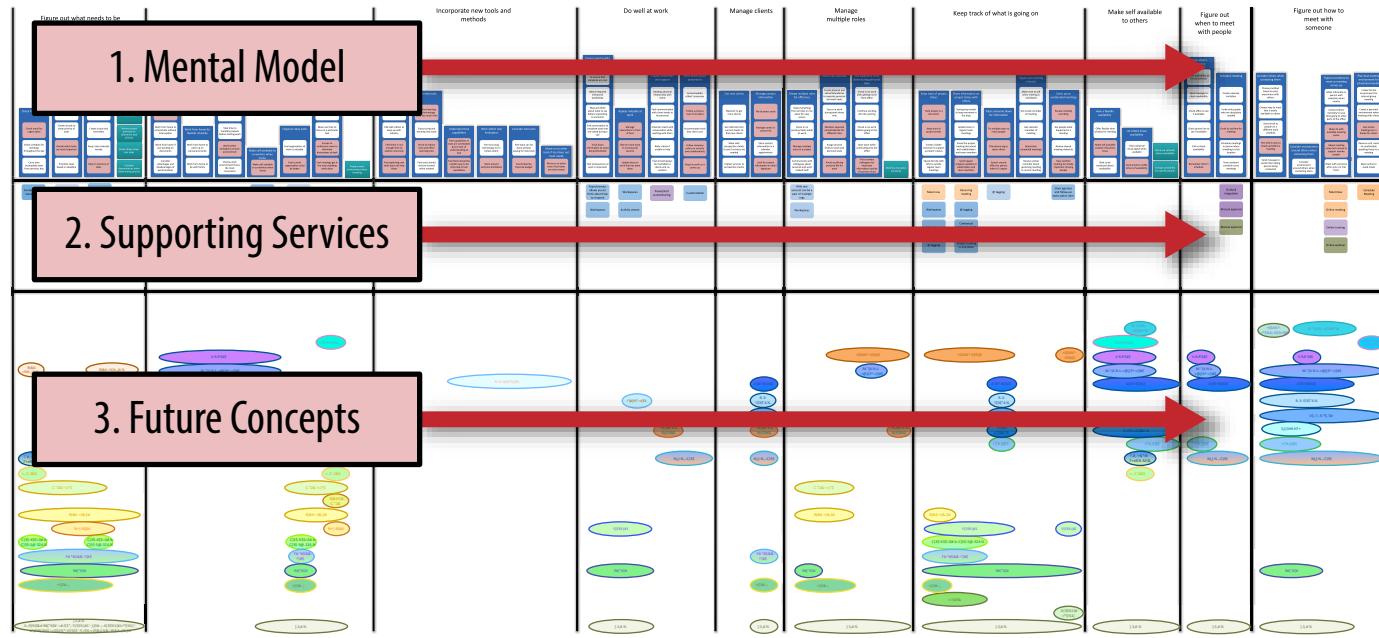
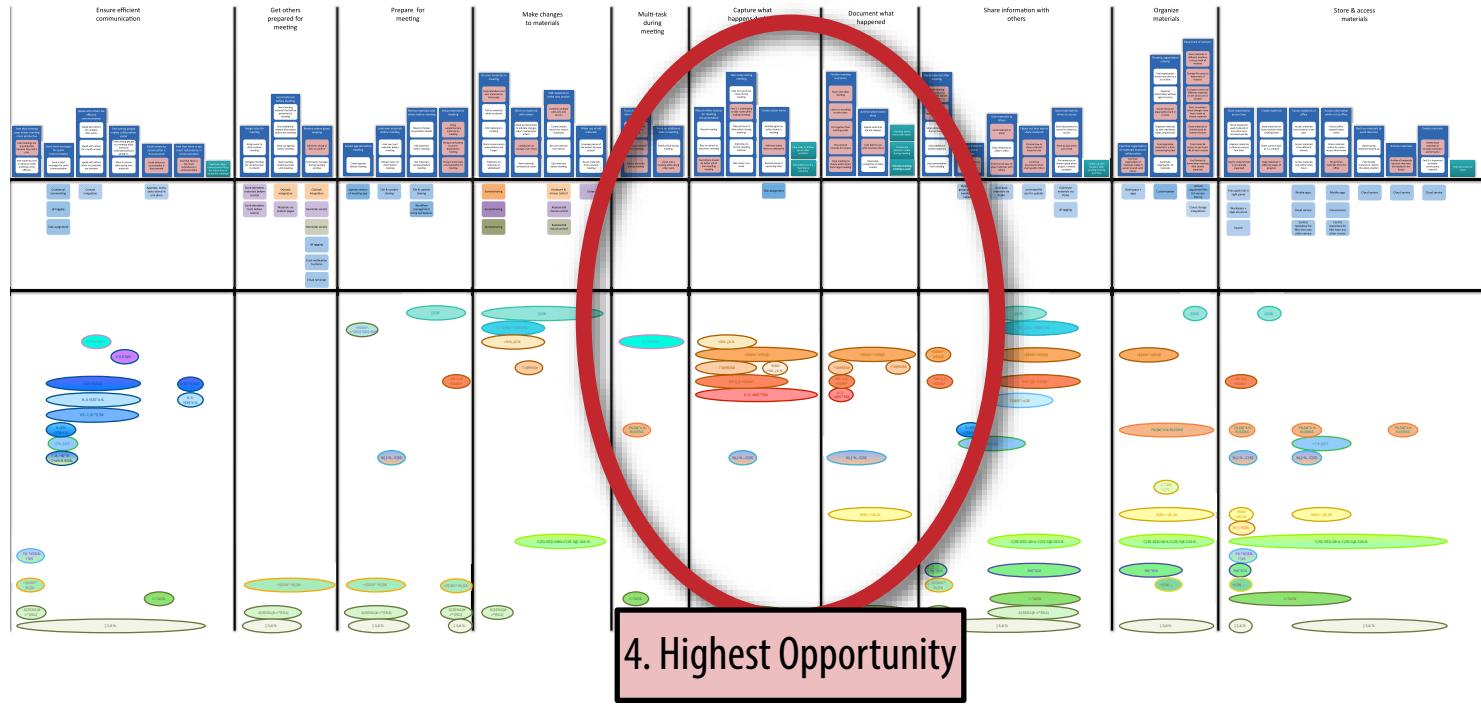


FIGURE 2-12. A portion of the extended mental mode diagram showing the highest areas of opportunity. Note that the resolution on this diagram is intentionally low to protect confidential information from being read. The point is to understand the alignment of four layers of information:

1. The individual's experience represented as a mental model diagram
2. Services that currently support their experience
3. Future concepts developed by the team
4. The areas of unmet needs reflecting the highest opportunity, determined by the jobs to be done research

Through these efforts multiple concepts have been prototyped and two innovations are being launched in the Apple Store, along with several patent submissions. Overall, the approach gave a rich, user-centered theory for service development. The

combination of the mental model and jobs to be done methods has served as a centerpiece in the process, fostering many conversations and gathering consensus.



Further Reading

Anthony Ulwick. *What Customers Want* (McGraw Hill, 2005).

Anthony Ulwick. "Turn Customer Input into Innovation," *Harvard Business Review* (2003).

Elizabeth Thapliyal is a lead UX designer coleading needs-based innovation projects at Citrix with an MBA in Strategic Design from the California College of the Arts.

Ryan Kasper is a UX researcher, currently at Facebook, and holds a PhD in Cognitive Psychology from the University of California, Santa Barbara.

About the Coauthors

Jen Padilla is an expert user researcher who has worked at software companies in the San Francisco area, including Microsoft, Citrix, and Cisco.

Diagram and Image Credits

Figure 2-2: Harry Beck's London Underground map, licensed from © TfL from the London Transport Museum collection.

Figure 2-4. Image of Booking.com, used with permission. See: Andre Manning. "The Booking Truth: Delighting Guests Takes More Than a Well-Priced Bed" (Jun 2013). <http://news.booking.com/the-booking-truth-delighting-guests-takes-more-than-a-well-priced-bed-us>.

Figure 2-5: 360° Touchpoint matrix Accelerom AG, international consultancy and research firm based in Zurich (www.accelerom.com), used with permission. Accelerom has been combining management practice, cross-media marketing research, and cutting-edge analysis and visualization technologies for over a decade. For more, see: <http://bit.ly/1WM1QyU>.

Figure 2-6: Touchpoint matrix created by Gianluca Brugnoli, used with permission, originally appearing in: Gianluca Brugnoli. "Connecting the Dots of User Experience," *Journal of Information Architecture* (2009). <http://journalofia.org/volume1/issue1/02-brugnoli/jofia-0101-02-brugnoli.pdf>.

Figure 2-8: Zero Moment of Truth from: Jim Lecinski. *ZMOT: Winning the Zero Moment of Truth* (Google, 2011). https://ssl.gstatic.com/think/docs/2011-winning-zmot-ebook_research-studies.pdf.

Figure 2-9: Original photo by Elizabeth Thapliyal, used with permission.

Figure 2-12: Extended mental model diagram created by Amber Brown, Elizabeth Thapliyal, and Ryan Kasper, used with permission.

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"In a quickly changing space, Scott Hurff shares an informed, actionable perspective."

—Randy J. Hunt, VP Design, Etsy

DESIGNING HOW GREAT DESIGNERS PRODUCTS CREATE SUCCESSFUL PEOPLE PRODUCTS LOVE

SCOTT HURFF

The Mechanics of Interface Design

The Push and Pull of Prototypes Versus Pixel Perfection

I keep a large number of details that will later go. I first do the animal with almost all its trappings. Then I gradually eliminate them...

—FRANÇOIS POMPON, FRENCH SCULPTOR AND ANIMALIER

BORN IN 1855, ONE of my favorite new artists, François Pompon, applied his coveted talents as a sculpting assistant for legendary artists Auguste Rodin and Camille Claudel in Paris. It wasn't until 1922 at the age of 67, however, that Pompon became famous for his own work.

Called *L'ours Blanc*, or *The White Bear*, Pompon's huge sculpture of a polar bear is something truly unique (Figure 6-1). It lacks any ornamentation or flourish. It eliminates every unnecessary detail. And it makes no attempt to be realistic. Without these elements, the viewer is struck by the raw presence and personality of the bear. Pompon eliminated the unnecessary details to help us focus on what makes the bear, well, a bear.

In this case, both the product *and* the process fascinate me. Pompon would actually sculpt his subjects (at this point in his life, they were mostly animals) with most of the details intact. Then, over time, he'd eliminate these details—the waviness of the fur, the texture of the

feathers, the sharpness of the claw—to focus on only the necessary aspects of the subject’s form. Without these details, he let the viewer focus on the purest elements of the animal’s character.

FIGURE 6-1

Pompon’s L’ours Blanc.

Photo by Rodney

(<https://flic.kr/p/4jq2HD>).



As product designers, our job in this phase is similar, albeit less physical. We’re gathering all of the information we can, completely immersing ourselves in the problems faced by our potential customers. We’re binging on current alternatives in the marketplace, sampling heavily to get inspiration for our own yet-to-be-invented solutions. Then, we’re iterating rapidly through the most plausible solutions to see what works best.

At this stage, we’re already moving along the process of stripping away the unnecessary. Increasing fidelity. Moving toward something we can *ship* (Figure 6-2). In Chapter 4, we created the copy for our product’s interface and began turning that copy into user flows and screens. In Chapter 5, we began morphing those flows into something tangible, something we could use to test ideas and start *feeling* how the product might behave.

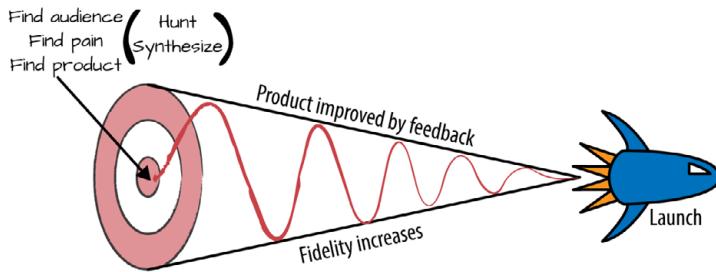


FIGURE 6-2

Remember the product creation model? We're moving toward launch, but we're still not quite there yet.

Now, we're finally going to refine these elements into the ingredients necessary for a badass user interface.

I think a lot of product designers make the mistake of jumping *directly* into Photoshop or Sketch or Illustrator. They misinterpret what it means to be *interface first*, and get caught in a loop of trying to achieve pixel perfection before really knowing which direction they're going.

Look, there's a push and a pull between all these axes. If interface copywriting, pixel-perfect mocks, and functioning prototypes were on a spaceship together, they'd be the directional thrusters responsible for lining up the ship for a clean seal on the airlock.

Like I said in Chapter 5, this push-and-pull depends on your time-frame, your internal audience, the required fidelity at any given stage, and your comfort with the tools you're using.

But at some point after you've written out your interface and its flows, you're going to have to deliver pixel-perfect mocks.

Here's why. See, regardless of the internal living document that is your product plan and milestones—call it a spec, call it a user story, call it whatever buzzword your people use—combined with the prototypes you create, you're still going to need the “hero” version of your product's interface.

Apple, unsurprisingly, takes this approach to the extreme. Called *10 to 3 to 1*, Apple product designers are expected to design 10 wholly different, high-fidelity mocks for each feature to be built. The 10 ideas are narrowed down to the best three, and then the team combines the best ideas of the best three into the final product.*

* <http://pragmaticmarketing.com/resources/you-can't-innovate-like-apple?p=0#sthash.JmgfLmPI.dpuf>

While this approach might seem too systematic or wasteful to some, it balances the pressures of creativity with a production mentality. It codifies the fact that most ideas will be left on the cutting room floor, but also sets limits on creative exploration. The goal is to drive a designer's imagination in the right direction.

Why? Because pixel-perfect mockups are the ultimate communicator, because they can be integrated into your prototypes and filled out with the real copy you've already created. Then, *boom*. Suddenly, you're fooling everybody that this is a real product. Disbelief is suspended, and true opinions flow out. On top of that, pixel perfection, combined with prototypes, are the ultimate guidebook for engineers.

So when the final product launches, nobody's going to be taken by surprise.

I'll take those benefits over a so-called *functional spec* any day.

But while pixel perfection is critical, it sure ain't easy. It takes a crazy amount of time. There are multiple screen sizes. Different platforms. Landscape mode. Portrait mode. Ergonomics to keep in mind. And five states for every interface.

But if you plan for these contingencies, the process becomes less overwhelming.

Let's start with the *UI stack*. In the next section, you'll learn how to avoid the pitfalls of what I call "awkward UI" by always remembering how the five states of an interface work together.

The UI Stack: Five States of Interface Design

Have you ever experienced a user interface that feels lifeless? Have you created a UI that just seems to be missing...*something*?

If that's the case, you've probably experienced a case of awkward UI.

Awkward UI is a missing loading indicator. It's forgetting to tell your customer where something went wrong (bonus points for doing so with a scary error message). It's a graph that looks weird with only a few data points. It's a linear *snap* into place when a new piece of data is introduced.

Still not clear about what awkward UI is? Here's a simple real-world example: I use Apple TV. A lot. (In fact, I have the latest episode of *Star Wars: Rebels* playing in the background as I write this.) Whenever I pull up my Purchased movies, I see the screen shown in Figure 6-3.

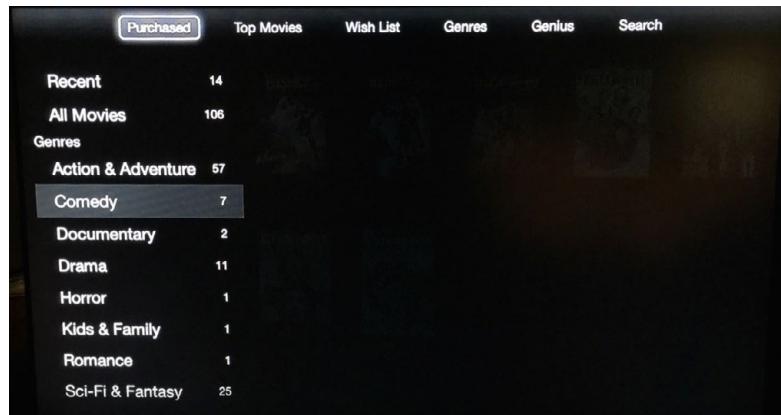


FIGURE 6-3

Apple TV's loading indicator for calling up a list of purchases is nonexistent. And it scares me. Every time.

For a second, I get scared. Every time. And I use this screen often. I know what to expect.

But why am I scared? What are the mechanics that cause my brain to think I'm seeing what the Apple TV intends for me to see?

There's no loading indicator. No sign of activity. So in the span of seconds, scary questions race through my head. Where are my movies? Are they lost? Deleted? Hijacked?

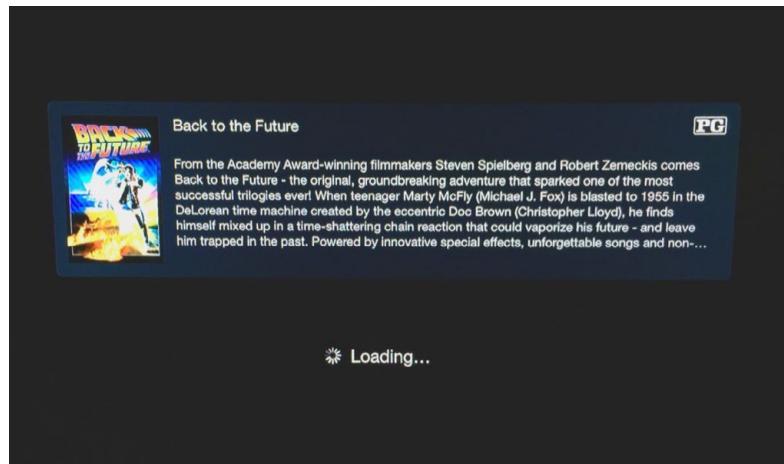
Then, after my heart stops racing, the movies I own suddenly and unceremoniously pop into place.

Man, that's jarring.

Contrast this with playing a movie. After clicking "play" on the Apple remote, I see a nice indicator that *Back to the Future* is getting ready to play (Figure 6-4).

FIGURE 6-4

The comforting signs of progress.



Notice the experiential difference?

Creating interfaces that are easily understood by humans puts us product designers right up against the sad fact that computers are lazy. They don't care about helping people understand what's new, what to do next, or how to react when something goes wrong.

In a computer's ideal world, all it would have to do is throw obscure error codes and scary-sounding alerts when something unexpected happens. Or, better yet, it would just talk with you in binary.

But we don't speak binary. We think in flows, and we're used to the physical world. When a door opens, it swings on an arc. When something travels, you can see it move. When something falls, you can see it bounce.

Awkward UI is when a product designer doesn't take these things into account. That means that somewhere along the line, some rules have been broken.

But which rules?

The rules of the *UI stack*. Let's talk about that now.

What's the UI Stack?

Every screen you interact with in a digital product has multiple personalities. Five, to be exact (Figure 6-5).

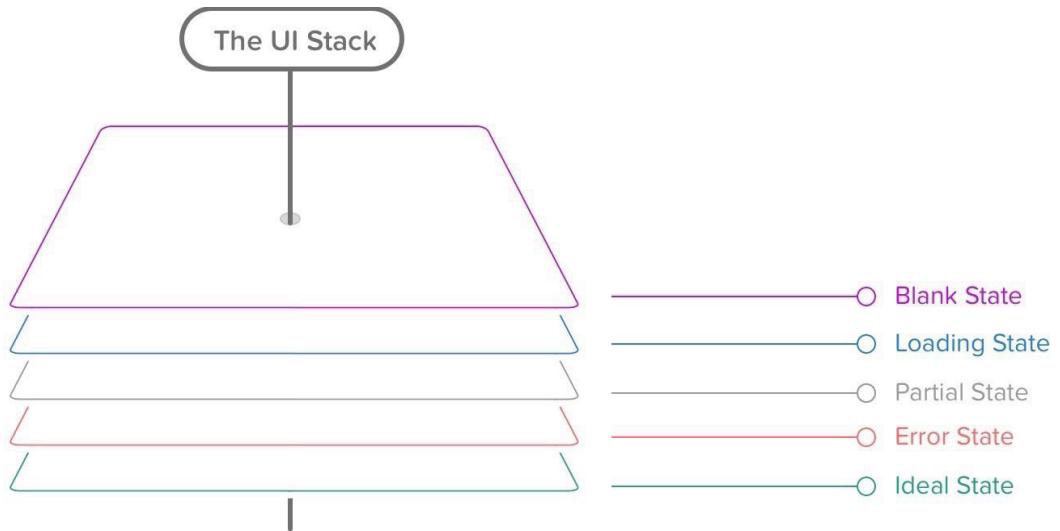


FIGURE 6-5

The UI Stack consists of the five states of a single screen's user interface, as well as how the user moves through those states.

Depending on the context, these personalities are revealed to your customer. In designer-speak, we call these *states*. And you should consider these states for every screen you make.

That's because following the rules of the UI stack and the five states helps you create a cohesive interface that's forgiving, helpful, and human.

Be honest with yourself. When's the last time you created a screen that had only one state? Even if you're creating weather apps (cue Dribbble joke), one state won't cut it.

The reality is that the world in which we live isn't perfect, and things go wrong. Servers take time to respond. And your customers won't always use your product the way in which you intended.

So, as a product designer, you've got to take these realities into account.

That's why every screen you'll design for your product can have up to five states:

- Ideal state
- Empty state, including first-time use

- Error state
- Partial state
- Loading state

As your customer moves through your product’s flows, they’re also going to move seamlessly between each state within those flows. In other words, each state in the UI stack is built with the notion that *UI states smoothly transition from one to another*, and as many times as necessary. We’ll explore this notion together in the section “A Hypothetical Example” of this chapter on page 152.

But first, a brief interlude into Internet history. Back in 2004, Basecamp, the company formerly known as 37signals, wrote, in my humble opinion, a groundbreaking piece entitled *The Three State Solution*.* (And no, this isn’t a plan to end the Israeli-Palestinian conflict.) They outlined that every screen should consider three possible states: “regular, blank, and error.” This blew my mind. And changed how I thought about design for the Web forever.

But things change on the Internet. First, there was the AJAX revolution (coinciding with the rise of *Web 2.0*, as it was then known). Then came mobile apps. Next came the mass consumerization of mobile and tablets and the Web in general.

Demands and expectations for UIs changed. And so the UI stack is my adaptation of the decade-plus idea from Basecamp.

With that noted, let’s talk about the ideal state.

IDEAL STATE

This is the first state to create, since it’s what you want people to see most often. Aptly named, it embodies the zenith of your product’s potential—when your product is providing maximum value and is full of useful, actionable content. It’ll serve as the foundation for every other state you’ll create for this screen. Think of this as the quintessential marketing page or mobile app store screenshot.

Let this state set the tone of each of the other states. Because as you iterate on your core interface, this UI could change completely over time. That’s both the beauty and the risk of iteration.

And this has vast consequences for all of the other states.

* https://gettingreal.37signals.com/ch09_Three_State_Solution.php

All UI states lead to the ideal state. So start with this first, and let all of the other states fall into place as your designs get closer to solving your customer's problem.

Still not sure what I mean by the ideal state? Let's take a look at some examples to clarify (see Figures 6-6 through 6-8).

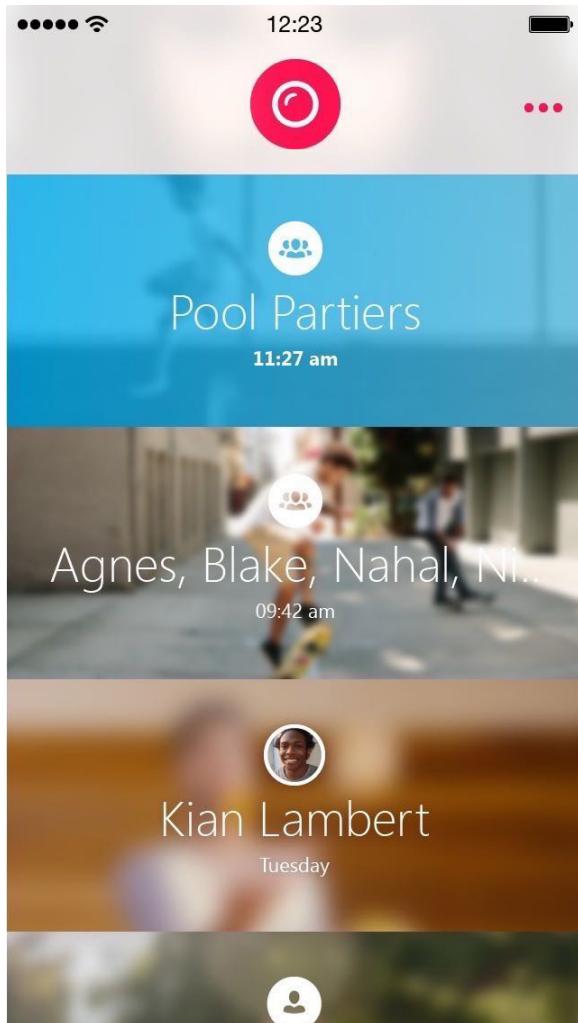


FIGURE 6-6

A picturesque view of the ideal state for Qik, Skype's standalone video app. Here, we have many groups from which to choose, with active users ready to receive your compelling video messages.

FIGURE 6-7

Tinder works best when there are new people to meet. Here, we see the dating app's ideal state—a customer you haven't seen before, with many more options only a swipe away.



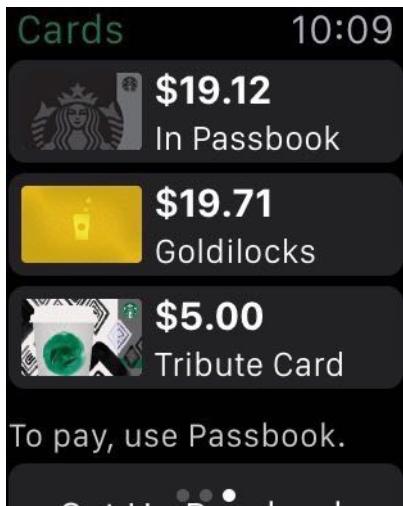


FIGURE 6-8

The ideal state of Starbucks's app, which shows one's various cards and their relative balances. The only sad part is that keeping my balances this high on a weekly basis requires a significant investment. At least it's a relatively cheap addiction.

EMPTY STATE

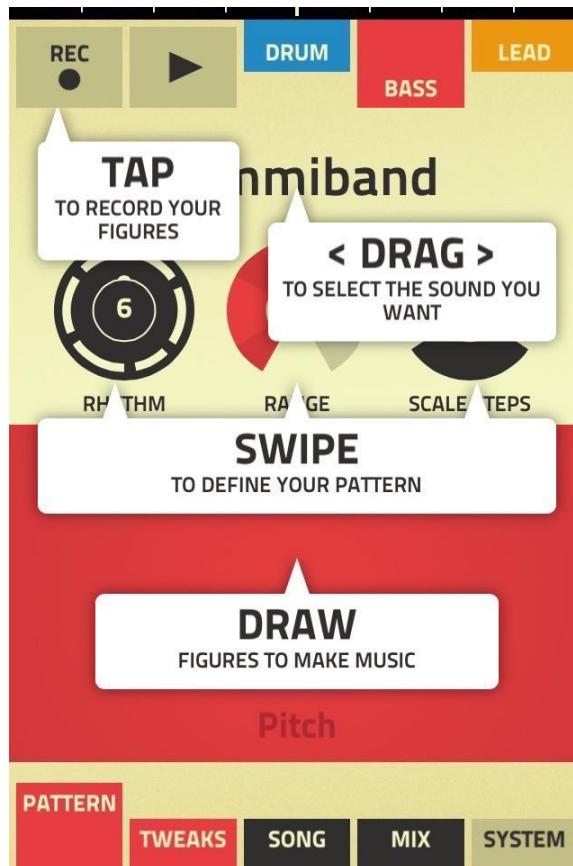
An empty state really is bigger than just one screen. It's about providing your customer an incredible first impression as you introduce them to your product—to spur them to action, keep them interested, and remind them of the value your product's going to provide.

There are three broad versions of the empty state. The first is what's seen by your customer the first time they use your product. The second is what's seen when your customer voluntarily clears existing data from the screen, like when you attain the exalted "Inbox Zero," for example. And the third is what happens when there isn't anything to show, say, for a search result.

Broadly speaking, the risk with empty states is that it's easy to tack them on as an afterthought. Most of the time, doing this either creates an overwhelming experience (see Figure 6-9) or a cold, impersonal one.

FIGURE 6-9

As George Takei would say: "Oh, my..." While I love Propellerhead's beat-making app Figure, the coach marks are oppressive and overwhelming. Where does one even start? How am I going to remember all of this?



Coach marks—or instructional overlays—are, in my opinion, the best examples of an underthought first-time experience. They place a burden of learning on the customer that includes more interface and more memorization, all done with a pretty big mental interruption. What a buzzkill.

Let's explore the first-time use state more in depth.

First-time use/onboarding

If a customer is using your product for the first time, this state is your one shot to describe what your customer will see when data exists. It's your opportunity to encourage action, to help them understand the value they're going to get out of this screen. First impressions happen only once, and this is your chance to make a great one.

I liken this state partially to what's known in the literary and screen-writing world as the "hero's journey" (Figure 6-10). Introduced by Joseph Campbell in his amazing work *The Hero with a Thousand Faces*,* it's the foundation of mythological stories found throughout the world, from *The Odyssey* to *Star Wars*. Here's the basic premise:

A hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man.

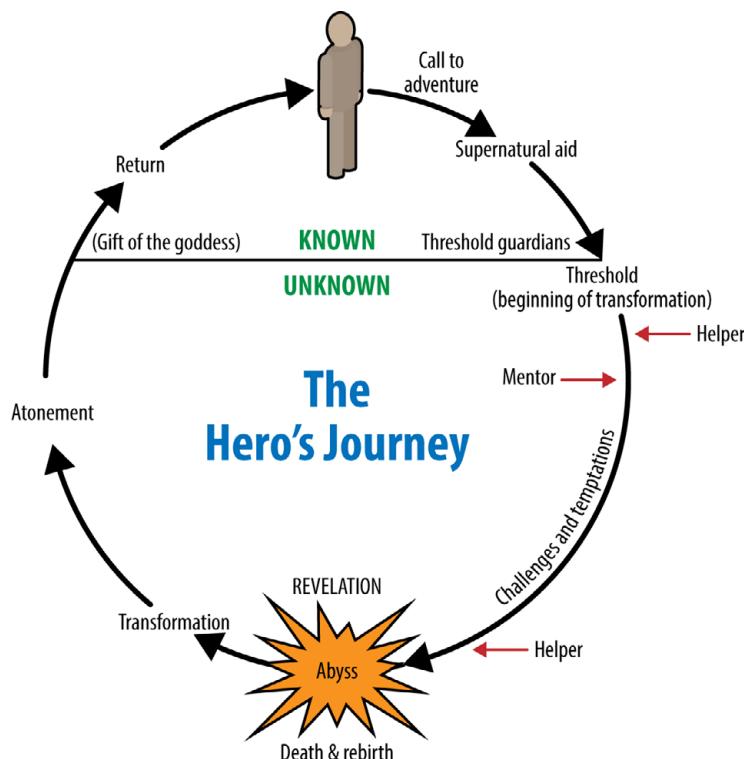


FIGURE 6-10
The hero's journey.

Propel your customers down the hero's journey with the empty state. Call them to adventure, take them through known challenges and the temptations of the abyss, and transform them into more powerful individuals.

* <http://amzn.to/1C6SgTo>

But how? Some ideas:

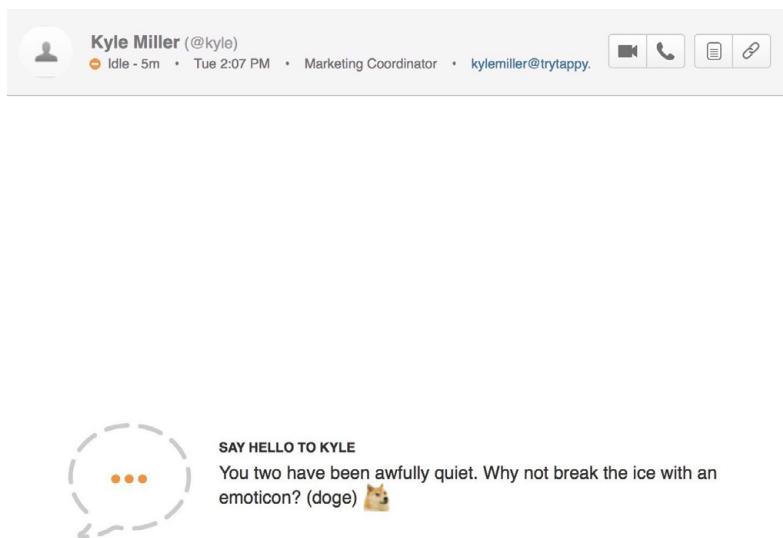
- Lead a horse to water. Be encouraging and uplifting in your copywriting, and speak plainly about what to do. For example, saying things like “Nothing to see here” really says nothing about what your customer should expect, and it’s a bit depressing that this would be the first thing they’d see. Instead, telling your customer the exact button to press and why they should press it is a much more helpful prospect.
- Use your product’s content to instruct your customer about what to do. For example, if you’re building a messaging product, your first-time experience might automatically include a message in the customer’s inbox. The subject line could say “tap to open me,” while the text within the message discusses more about how to manipulate and reply to a message.
- Offer an example screenshot of what the screen will look like in the ideal state. It brings a bit of hope to your customer that they’ll achieve something similar while showing off how potentially useful your product can be.
- Monitor your customer’s progress and respond accordingly. If they pause too long on a certain screen, for example, you could message them with a live chat asking if they need help.

FIGURE 6-11

Hipchat comes right out and tells you what to do

while hinting at some fun, extra functionality that’s hidden beneath the surface. This state reminds you of the product’s purpose and, hopefully, demonstrates its value by getting you a response back in real time. One critique is that the copy isn’t aware of the fact that Kyle is currently idle, what this means, and that he may not respond immediately.

Figures 6-11 through 6-14 show a few first-time-use empty states that I love.



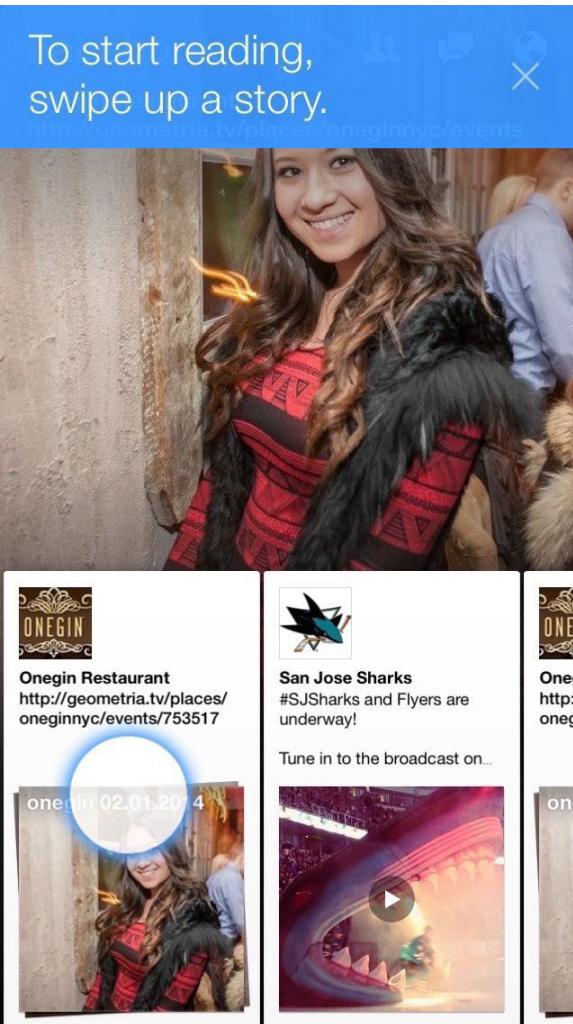


FIGURE 6-12

Facebook Paper gradually introduces you to its functionality while teaching you key gestures. My critique of this flow is that, while beautiful, it's triggered almost immediately after I sign up, giving me little time to grasp the product. And having to tap the X to exit the "tutorial" can be annoying for some.

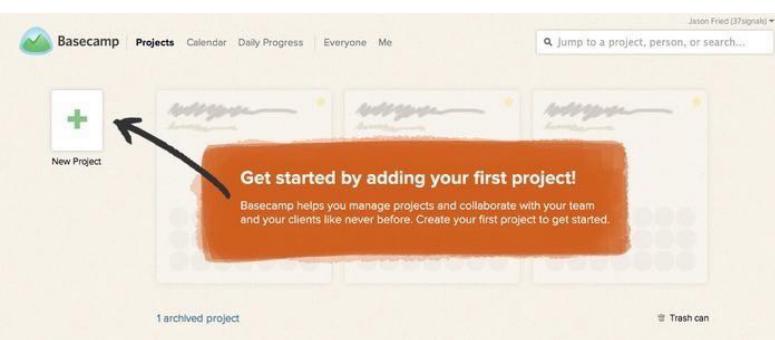
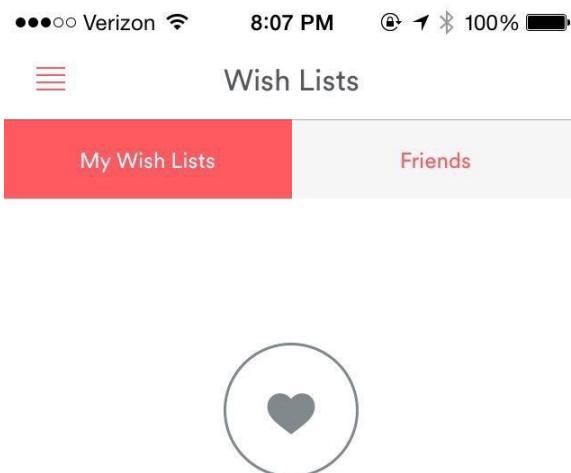


FIGURE 6-13

Basecamp has no content to show you—but instead of filling the screen with nothing, it places stand-in content for you to visualize the product's potential. The completionist in me wants to create projects so I can see this screen full of utopian productivity.

FIGURE 6-14

Tapping into Airbnb's Wish List for the first time gives you this stylishly simple empty state. What I love about this design is that it doesn't try too hard (fitting with Airbnb's design language), but it also has a very clear call to action to get you to start gathering data.



Your Wish Lists will live here

Explore thousands of fairytale destinations and add your favorite spaces from around the world.

Start Exploring

The subject of onboarding and first-time states is a topic big enough for another book. And it just so happens that one exists. If you want to jump into the user onboarding pool, I highly recommend Samuel Hulick's excellent *The Elements of User Onboarding*.*

User-cleared data

The second type of empty state is the case where your customer has voluntarily removed data from the screen. An example of this would be if your customer completed all of the items on their to-do list, read all of their notifications, archived all of their emails, or finished downloading all of their music.

* <https://www.useronboard.com/training/>

These types of empty states are great opportunities to reward your customers or to spur further action (Figure 6-15). Achieved “Inbox Zero”? Great! View this amazing photo. Downloaded all of your music? Good—now go listen to it. Sifted through all of your notifications? Here’s something else you might want to read.

A customer clearing data is a customer who’s engaged with your product. Keep them in the flows your product has in place by doing the work for them. Don’t put the onus on your customer to make the next leap.

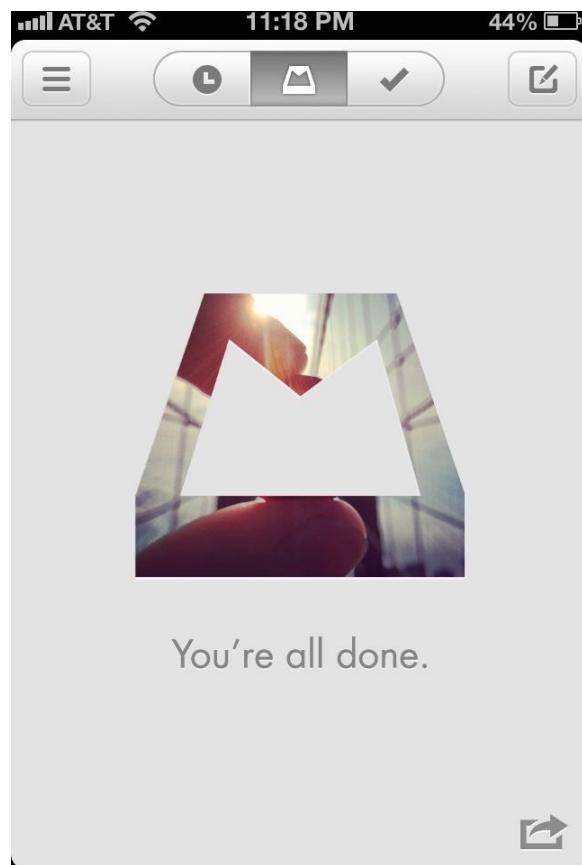


FIGURE 6-15

A vintage screenshot from iOS 6, yes, but one that still illustrates the slight dopamine drip that comes with achieving Inbox Zero. Your reward is a hand-selected Instagram scene from somebody’s coffee shop or sunset—and you can share it out, where you’ll celebrate your Inbox Zero and also advertise for Mailbox. Triple win!

No results

In cases where your customers are browsing or searching for a piece of data in your product, there’s a chance that they won’t find what they’re looking for. These scenarios are amazing opportunities to infer what your customer intended to find and to make intelligent suggestions.

Amazon employs one of the best examples I've seen of this technique. Accounting for misspellings and similar searches, Amazon's search rarely gives you an empty result (Figure 6-16). Instead, it'll give you the closest matching result while showing which terms it didn't match.

FIGURE 6-16

The example where I finally reveal my love
for metal, and for Metallica. Oh, well,
it had to come out sometime.

A screenshot of an Amazon mobile search results page. The search bar at the top contains the query "metallikka". Below the search bar, a message says "Showing results for 'metallikka'. Did you mean: metallica". A link "See more results for 'metallica' in All Departments" is present. The results list three items:

- Metallica**
by Metallica
Audio CD
\$9.00 ✓Prime
Get it by Tuesday, Mar 31
62 offers from \$4.37
★★★★★ (1528)
- Master Of Puppets**
by Metallica
MP3 Music
This item is not available for purchase from your device.
★★★★★ (1477)
- ...And Justice for All**
by Metallica
Audio CD
\$9.20 ✓Prime
Get it by Tuesday, Mar 31
50 offers from \$4.81
★★★★★ (997)

As for Pinterest (Figure 6-17), well, not quite the same results as Amazon, but this is Pinterest, after all. Based upon how their search parsed my query, it should be relatively easy for a customer to adjust their search terms to get what they want.

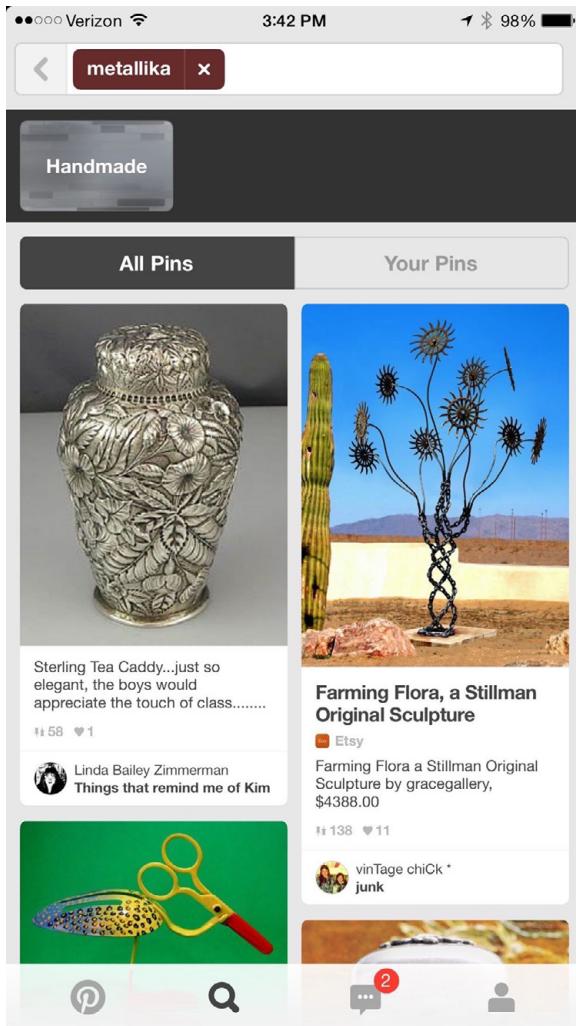


FIGURE 6-17

Notice the search results are categorized ("Handmade"), and the search term is turned into a pillbox for easy deletion.

The lesson: don't just drive your customer off a wall in this state. Give them something they might be able to work with, or suggest an alternate path.

ERROR STATE

This is the screen when things go wrong. Typically, this is more complex than just one screen, since errors can occur in surprising combinations. Error states can include anything from missing or invalid form data; an inability for your app to connect to the server; the app trying to move forward to the next step without finishing an upload, leaving a page without text submitted; and more.

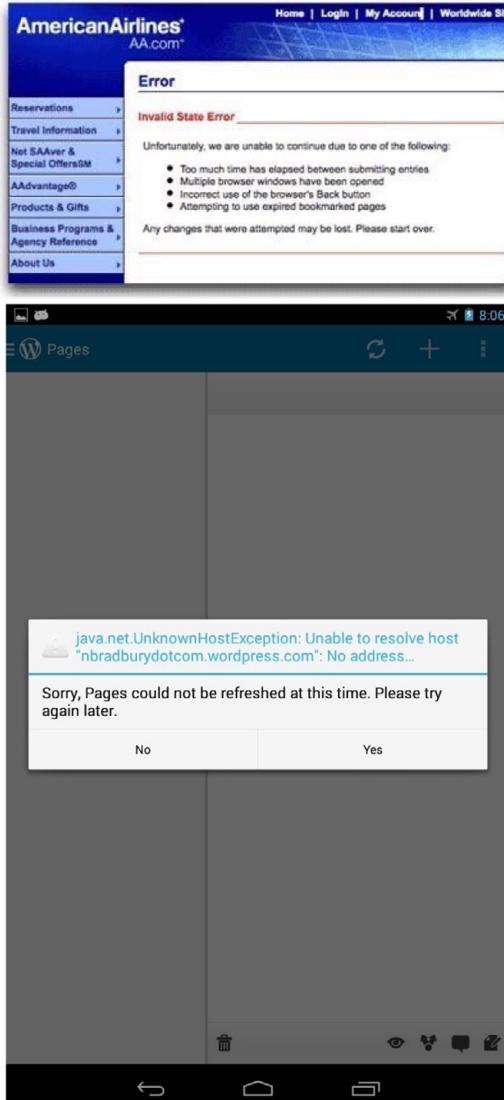
Error states should also be comforting in the sense that your product keeps all user input safe. Your product shouldn't undo, destroy, or delete anything entered or uploaded by your customer in the event of an error.

It's apt to paraphrase Jef Raskin, creator of the original Macintosh and author of *The Humane Interface*. He writes:

The system should treat all user input as sacred and—to paraphrase Asimov's first law of robotics, 'A robot shall not harm a human, or, through inaction, allow a human to come to harm.'
*The first law of interface design should be: A computer shall not harm your work or, through inaction, allow your work to come to harm.**

This advice could be well heeded by some particularly vile offenders of this rule: airline websites. Missing a tiny form field for a credit card security code, for example, frequently results in a page reload that blows away all of your meticulously entered details while highlighting the missed field with an offensive red hue (Figure 6-18).

* Jef Raskin, *The Humane Interface* (Boston: Addison-Wesley Professional, 2000), 5.



No! Yes! Maybe?

Ah, finally, a contextual error message we can follow. Bonus: we get a little sense of humor to humanize it (Figure 6-19).

FIGURE 6-18

American Airlines has learned better by now—and I’m sure WordPress has, too. But freaking people out with gibberish-laced error messages or apocalyptic-like reasoning for blowing up one’s work is simply unacceptable.

Just last week, 5,535 companies signed up for Basecamp.

- Prices start at just \$20/month. [Jump to the full price list.](#)
- Every customer gets a **no-obligation, 60-day unlimited-use free trial**.
- No credit card required. Just fill out the form below and you're in!

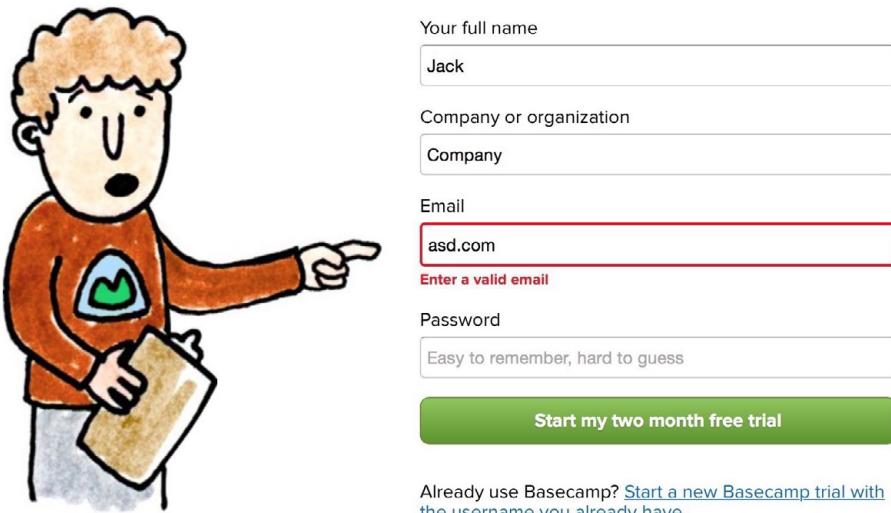


FIGURE 6-19

Basecamp's delightful, human, and highly specific error message upon signup for a new account.

Ideal error states, like Basecamp's, occur dynamically without destroying any data input by the user. If a page or screen reload must occur to detect an error, please do everyone a favor and save whatever data—however flawed—was input into your product. Typically, though, reloading a page to detect an error is a sign of laziness. For the sake of your customers, ensure you and your developers go the extra mile to handle errors in graceful and accommodating ways.

Additionally, error states shouldn't be dramatic, nor should they be vague. Remember the "Blue Screen of Death"? The Mac's "Kernel Panic"? Or—for those computing veterans—"Abort, Retry, Fail"? Each of these error states, by necessity, marked a significant system error requiring a computer reboot or retry. But to this day, each is well remembered because of the shock, fear, and confusion it conveyed to the end user.

Microsoft's Blue Screen of Death (Figure 6-20) became so infamous because it simply freaked people out. The blue screen—while better than a red one—was out of context, abrupt, and filled with scary-sounding jargon, even if it was useful in debugging the problem.



FIGURE 6-20
The legendary
Microsoft Windows
“Blue Screen of Death.”

That's because error states must incorporate concise, friendly, and instructive copy as to what to do next. Vague error codes, hexadecimal numbers, and confusing advancement options are only going to scare and frustrate the people who experience these errors.

Of course, your product's audience might consist of rocket scientists or computer engineers. That's a case when these highly technical error messages may be well suited to your customer. But as most of the world adopts software in their everyday lives, these types of error messages become less and less appropriate.

Generally speaking, great error messages are:

- Written with your specific customer in mind.
- Constructive, clear, and helpfully specific.
- Positive—not intimidating or overly dramatic.
- Presented with the core of the error first, and, if possible, an inferred solution.
- Specific about exactly what is in error.

- As timely as possible.
- Written in grammatically and thematically correct language, without jargon and excessive abbreviation.
- Offered with clear paths or options to resolution, and without excessive requirements (especially in the event of password security).

The error state is such a widespread occurrence, and one of the least desirable states for which to design. But I promise that if you put as much care into this state as you do into the previous two states, your product will be infinitely more joyful to use—and, more helpful, as you'll have thought through common customer pitfalls and solved them in advance.

PARTIAL STATE

The difference between an error state and an ideal state is like night and day. But how does the screen look when there's only one row of data? A few photos? A half-completed profile?

The partial state is the screen someone will see when the page is no longer empty and sparsely populated. Your job here is to prevent people from getting discouraged and giving up on your product.

This is a great opportunity to design micro-interactions to guide people toward the full glory of the ideal state. It's a journey on which you take your customers to help them realize the true value of your product. This implies an accomplishment—that your customer has spent some time in your product to see a glimpse of its potential. Keep them hooked.

Some game design principles can be useful here. I'm not referring to the scourge-like yet addictive practice of making your customers gather crystals to advance à la *Clash of Clans* (Figure 6-21), but instead building what is called *acceleration* into this state of your product.

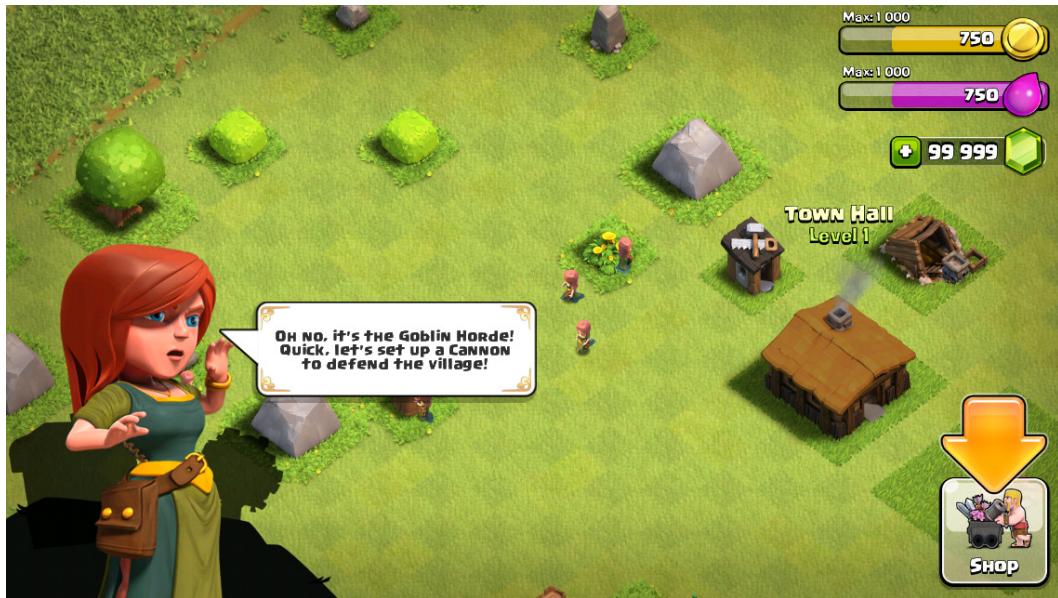


FIGURE 6-21

Big, huge arrows in Clash of Clans lead me to build a cannon so I can expend more crystals so I have to buy more crystals. Yep!*

Acceleration helps a player visualize how they'll be more powerful in the future, guiding them along a predefined series of tasks to complete to achieve this vision. The trick is to make the player not realize they're performing what could be perceived as tedium in order to extract the maximum value from your product.

Players entering [an acceleration phase] aren't thinking about the tedious repetitions they have to perform in order to level up, they're just doing them, and enjoying the accelerating rate of the results... Rather, those players are caught up in a future in which their character(s) will be powerful in a way they can't even understand yet. To put it more technically, they're inferring an exponentially increasing power structure that vanishes beyond their player prediction horizon. It's not exactly the same as traditional flow, but the exhilaration of the players is subjectively very similar.[†]

* http://clashofclans.wikia.com/wiki/Flammy%27s_Strategy_Guides/Total_Newbie_Guide

† http://thegamedesignforum.com/features/acceleration_flow_1.html

Figures 6-22 through 6-24 are some great examples of the partial state in the wild...

FIGURE 6-22

LinkedIn's famous "Profile Completeness" bar, encouraging you to perform exact tasks to achieve 100 percent. Completionists cheer.

Flow achieved.



FIGURE 6-23

Dropbox shows you how close you are to achieving some extra storage space, which is a major attractor for most Dropbox customers, I'm sure. Not only does Dropbox show you how many steps you have left to complete, but these steps also have the side effect of making customers more valuable through education and activation.

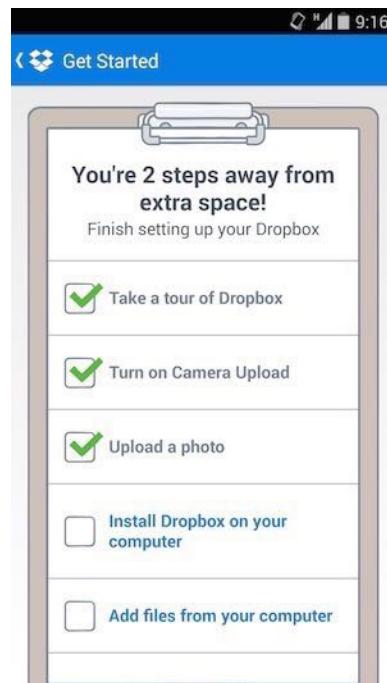




FIGURE 6-24

Apple Watch and its fitness app. Its entire goal is to get you to “fill up” the activity circles.

LOADING STATE

It's easy to overlook this state, and many product designers insert it as an afterthought. But there's a very real burden that comes with setting expectations. When your app is loading data, waiting for an Internet connection, or transitioning to another screen, you must take great care to be mindful of how you represent situations where you're fetching data. This can consist of an entire page takeover, lazy loading of content panes, or inline loading, potentially used when one might look up username availability from a form field.

And the perception of loading is equally important. Too often designers simply fill their screens with whitespace and spinners, placing a massive burden of responsibility on the content that isn't there. This,

in turn, encourages your customers to figuratively watch the clock—putting the focus on the indication of progress versus actual loading progress being made.

Such is the belief of Luke Wroblewski, a product design expert that's led design teams from eBay to Yahoo! to Google, where he now resides after selling his mobile polling startup Polar.

Wroblewski and his team discovered that after they implemented a series of loading spinners for each poll, Polar customers began complaining that the app seemed slower, saying things like "There seems to be an excessive amount of waiting around for pages to refresh and load—it doesn't seem as quick as the previous version."

Wroblewski realized that:

*With the introduction of these progress indicators, we had made people watch the clock. As a result, time went slower and so did our app. We focused on the indicator and not the progress, that is making it clear you are advancing toward your goal not just waiting around.**

Skeleton screens

This realization directly resulted in the creation of what Wroblewski calls "skeleton screens" (Figure 6-25). They're a technique that's been co-opted by at least Pinterest and Facebook in both their web and mobile versions.

Skeleton screens are an innovative take on the loading state—they place the focus on the content as it loads versus the fact that the content is loading. They accomplish this by displaying the basic structure of the page and gradually filling in the missing pieces as they download. The beautiful thing about this technique is that it can eliminate spinners completely. And it can increase the perceived performance of your product.

* <http://www.lukew.com/ff/entry.asp?1797>

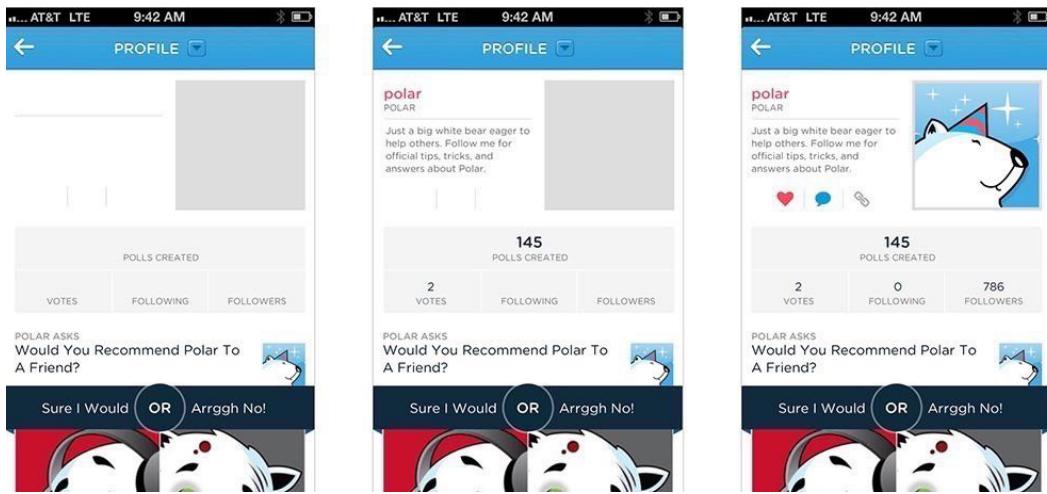


FIGURE 6-25

Luke Wroblewski's app, Polar, and its pioneering skeleton loading screens in action.[†]

Pinterest, while employing the use of the skeleton screen loading state concept, put a unique twist on its implementation: deriving the “average color” of the pin’s image and using that color to fill in the pin’s background. So before the pin’s image loads, you feel like you get a preview of what the pin will be. This technique is now used in Google Image search results, too.

Facebook invented a similar technique, used in their mobile app Paper and later implemented in their web version (Figure 6-26). The Facebook experience displays a stylized skeleton screen with shapes resembling content. And to communicate that the content is loading, the shapes will pulse with what Facebook calls a “shimmer effect.”

[†] Ibid.

FIGURE 6-26

Facebook invented a loading screen technique similar to Wroblewski's "skeleton screen" concept. They combined this technique with the "shimmer effect," which pulse the shapes to indicate loading activity.



Assuming success with optimistic actions

"Nobody wants to wait while they wait," said Instagram cofounder Mike Krieger in 2011 as he described how his engineering efforts achieved the app's perceived speed (Figure 6-27).*

Krieger, in fact, pioneered the notion that actions should be performed "optimistically" by a product. When an action's success is assumed, actions appear to take place much faster.

* <https://speakerdeck.com/mikeyk/secrets-to-lightning-fast-mobile-design>

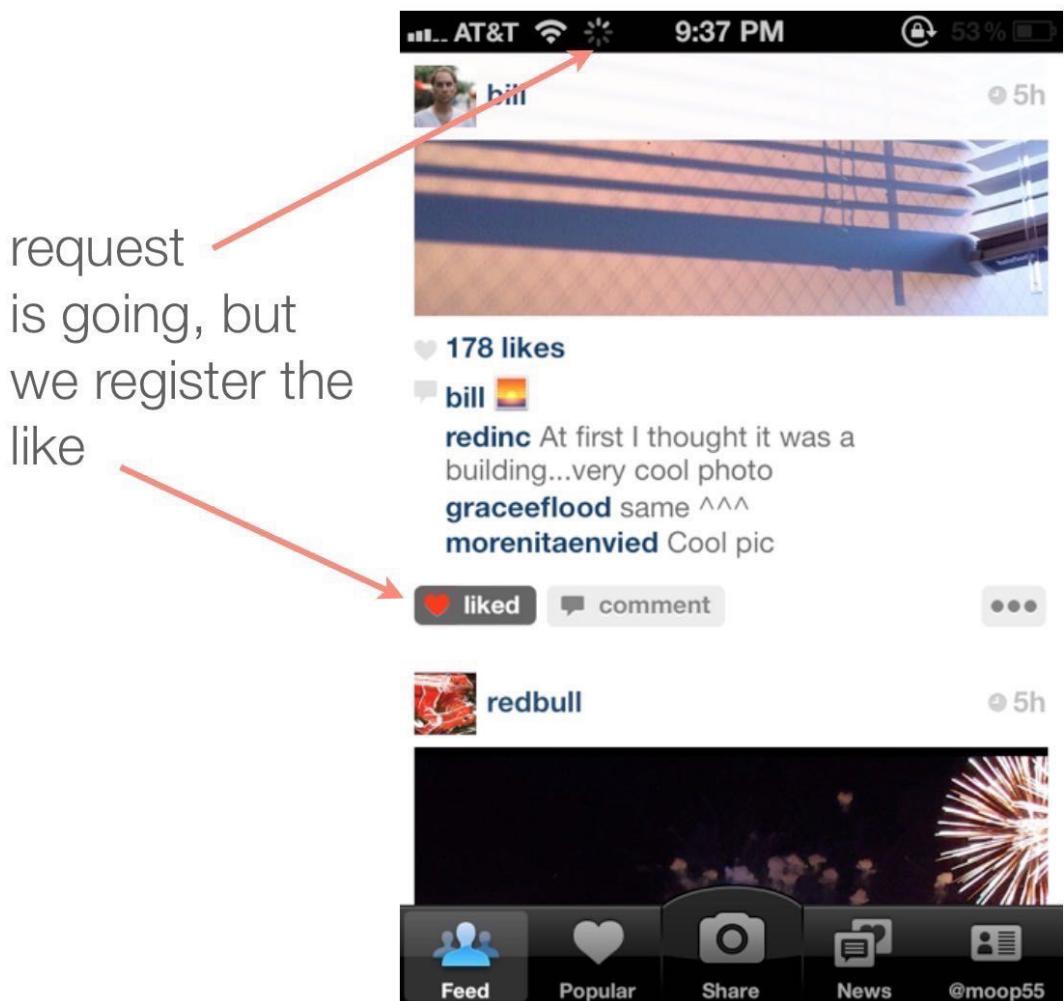


FIGURE 6-27

Optimistic success in action in an early version of Instagram.

Take the case of “liking” a photo or leaving a comment. In both cases, the action is registered as completed instantly from the perspective of the customer. And in the background, the product is making server requests to actually complete the action.

Optimistic actions can also greatly help to reduce the perceived speed of uploading media. Instead of uploading when a user taps “Done” at the end of the photo upload flow, Instagram starts uploading the photo immediately after a filter is selected. While it’s not an optimal

engineering solution—and data might get thrown out if your customer backtracks—it makes uploads appear to happen very quickly. Following the “move bits when no one’s watching” mantra can help make your product’s speed one of your assets.

A HYPOTHETICAL EXAMPLE

You’ve seen a number of examples of the UI stack and its five states in isolation (Figure 6-28). But how would they work together? How does the UI account for the transitions between each state?

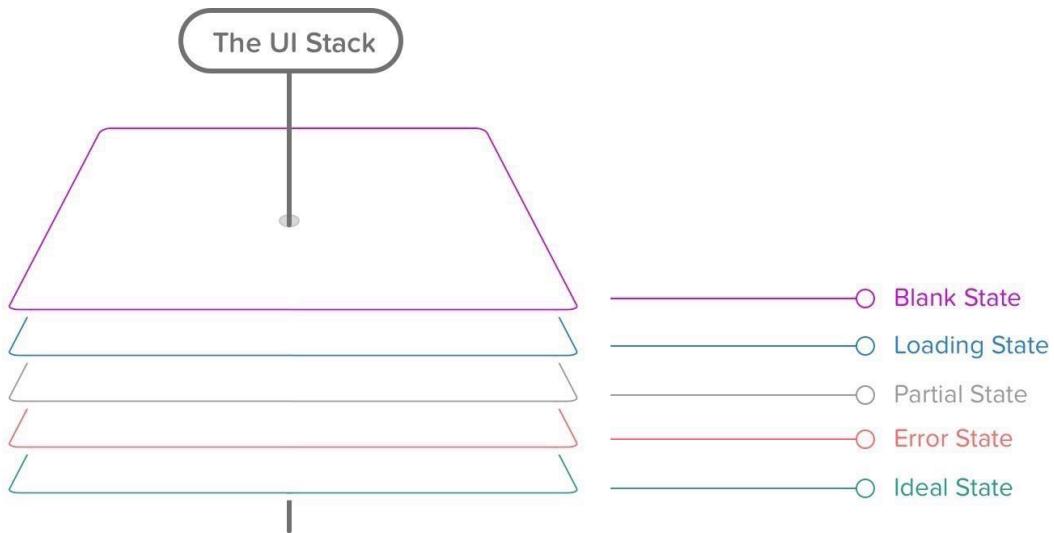


FIGURE 6-28

A reminder of the UI stack and its elements.

That’s the power of the UI stack. These states don’t exist in vacuums. They exist on a vertical axis that can be called at any time by the product. It’s your job not only to account for each of these states, but to dictate how the screen *moves* between each state.

I’ve created a hypothetical messaging app to illustrate these ideas.

Why a messaging app? Because it's not an immediately obvious example of these states at play. But I think it's a great example of how even temporal UIs like messaging interfaces follow the rules of the UI stack. And, even further, it's an illustration of how immense our responsibility is to ensure that each screen's states flow smoothly from one to another.

So what do we have to deal with in a messaging app?

We have to account for when there's no messages. This is our blank state.

Our partial state is when only one party has sent a message.

Then, there's receiving a message—the typing indicator. This, in other words, is our loading state.

But wait. There's another series of loading states—when *we* send a message out. And then there's the delivery confirmation.

An error can happen along the line, too. That's when our message fails to send.

And you can't forget the mechanism by which we recover from an error, and attempt to send again. There's *another* version of the loading state.

Finally, we reach our ideal state: when messages turn into a conversation.

Our hypothetical messaging app

Let's say Marty and Doc just exchange numbers and Marty wants to message Doc about what he's just seen at Twin Pines Mall.

Since there are no messages, we have an opportunity to exploit the empty state and encourage the customer into acting how we want them to act—in this case, that's sending a message (Figure 6-29).

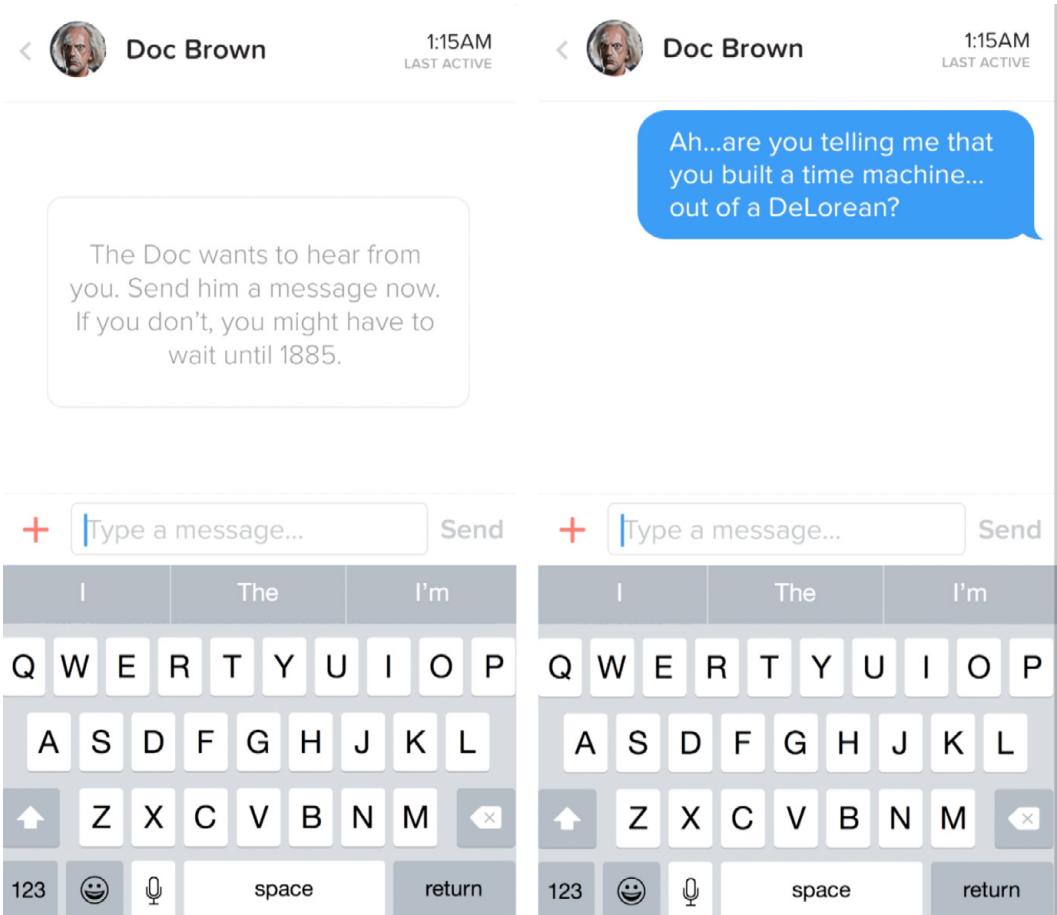


FIGURE 6-29

The blank state transitions into the partial state.

But what happens to this state when a message is sent? We need to gracefully wash away the empty state and shift it into a partial state: in this case, that's when Marty sends only one message.

Let's fast forward to when Doc has responded (Figure 6-30). He's sent one message—but he's not done yet! Hence the typing indicator, another form of a loading state.

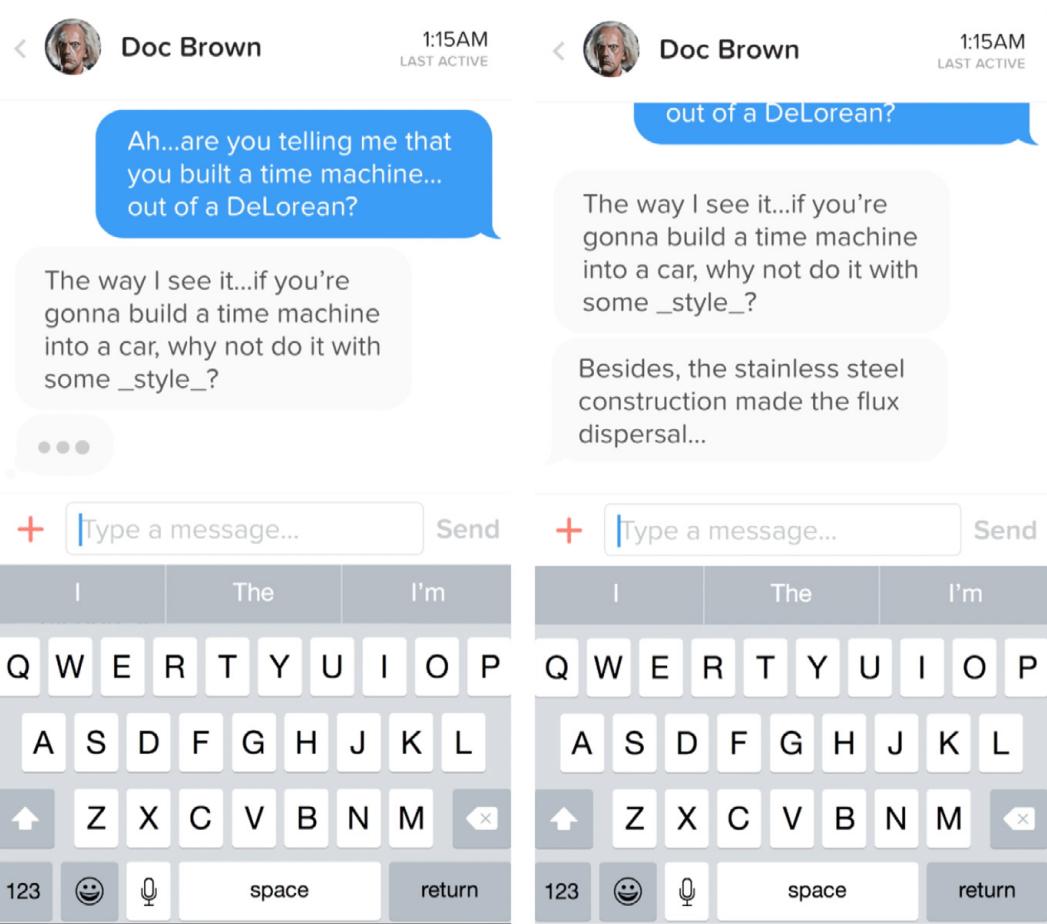


FIGURE 6-30

The loading state—in this case, the typing indicator—transitions into a new incoming message.

Once the typing is done and the message is sent, we transition out of the typing indicator and bring in the new message, pushing the others out of the way.

But what about when Marty wants to reply back (Figure 6-31)? First, we have to show some state awareness when there is text in the field—notice how the “Send” button turns from grey (a disabled state) to blue (an enabled state). Then, once we send the message, *another* loading

state occurs for our send process. We keep the message dimmed during this time because there's not a successful delivery yet—until the “delivered” stamp tells the customer that all is well.

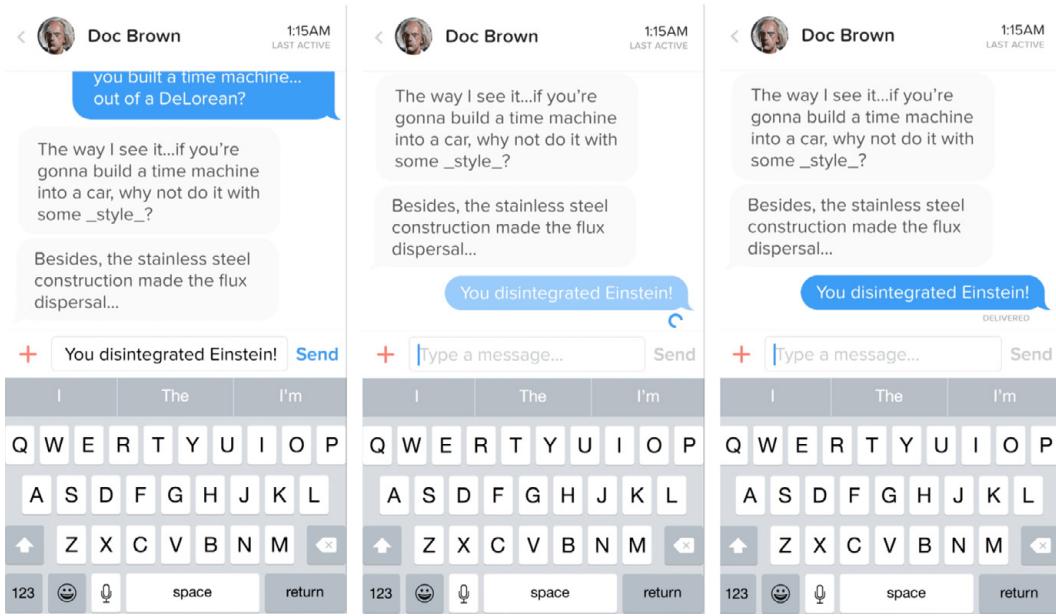


FIGURE 6-31

Sending a message requires state awareness changes on the “Send” button, as well as a series of loading states and a delivery confirmation.

But what happens if the message isn't successfully delivered (Figure 6-32)? Here comes our error state. The red marker replaces the loading spinner, and we're left with a message in the “undelivered” dimmed state. Tapping (or, in this case, clicking into the Quartz Composer prototype) on the undelivered message retries the send. We're in luck this time, and the message fills in after the angry red “!” disappears and we can register a delivered indicator.

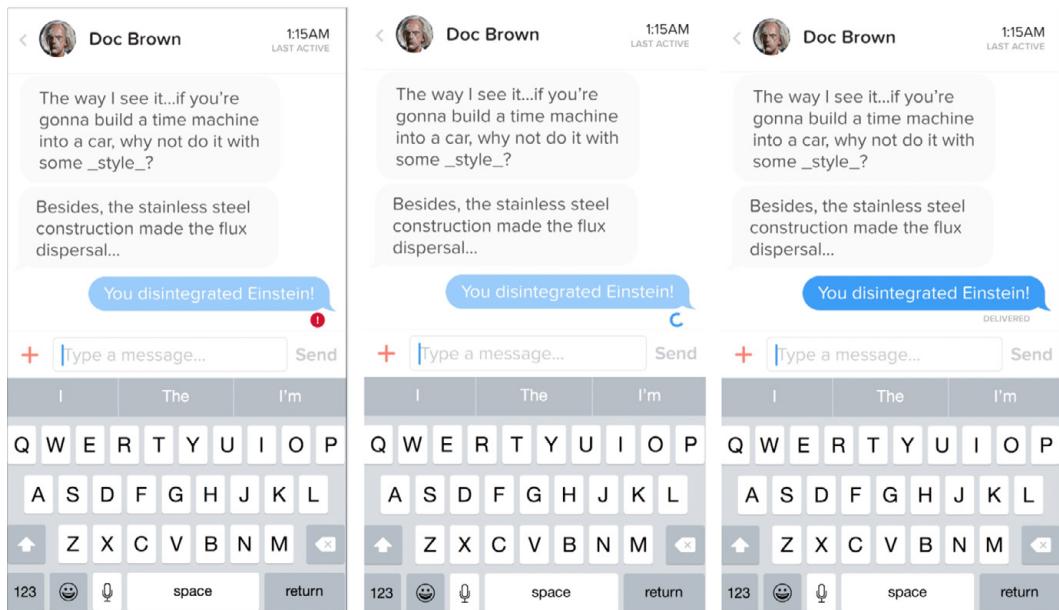


FIGURE 6-32

Retrying a message delivery after a failed attempt. Getting out of the error state requires some careful considerations.

And that, my friends, is the UI stack in action.

It's the five screen states and the seamless transitions between them. Without these transitional elements, we risk confusing or surprising our customers as new states appear and disappear. Making people uncomfortable and confused isn't exactly in our job description, now, is it?

Speaking of comfort, let's shift over to the ergonomic considerations UIs need to consider in this world of touch screens and wearables.

Ergonomics: Thumb Zones and Tap Targets

In the last section, we dove into the five states of a user interface: ideal, partial, empty, error, and loading. These constitute the UI stack. And they exist on every screen you design—these user interface states are universal, no matter the context. Desktop. Mobile. Tablet. Wearables. TVs. Cars.

Now, we're going to talk about how your interface should take into account the physical world.

No, we haven't suddenly jumped into the world of *Minority Report*, *Back to the Future* 2015 style, or gotten to play with those awesome holograms Tony Stark made with his friend JARVIS (or is he his friend? Hmm...)

We're actually going to be talking about natural thumb arcs and why they're important for touch screen design.

See, if you aren't designing yet for touch screens, you soon will be.

Don't believe me? Look at Figure 6-33. IT'S A BABY USING AN iPAD.

FIGURE 6-33

Babies using iPads.
Soon, dogs and cats
will be living together.
Mass hysteria ensues.



For the first time ever, a generation is growing up touch-screen-first. Let's just say touch-based interactions aren't going anywhere anytime soon. The mouse is becoming a relic of the past. We now must design for screens that can be tapped, pinched, swiped, zoomed, and more.

So how do we handle this?

Well, remember when we explored the history of product design in Chapter 1 together? We looked at the work of Lillian Gilbreth, Henry Dreyfuss, and Scott Cook. What was the big theme?

Research. Namely, we need to understand how people hold their phones, tablets, and wearables, and how they use touch-enabled desktops.

And we're in luck.

Mobile expert Steve Hoober conducted a study with 1,333 people in early 2013.* He discovered that people held their phones in the following ways (Figure 6-34):

* <http://www.uxmatters.com/mt/archives/2013/02/how-do-users-really-hold-mobile-devices.php>

- One-handed: 49%
- Cradled: 36%
- Two-handed: 15%

Handedness figures were also instructive:

- Right thumb on the screen: 67%
- Left thumb on the screen: 33%

Hoober notes that left-handedness figures in the population are around 10 percent. So the observed higher rate of left-handed use could be correlated with people doing other things at the same time—smoking, riding a bike, drinking coffee, eating currywurst, and so on.

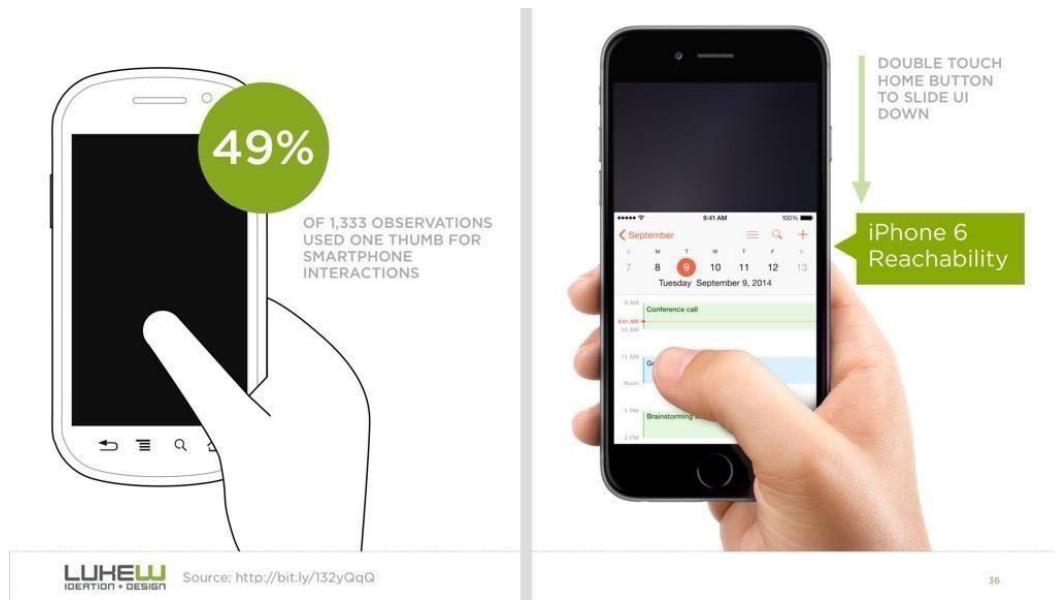


FIGURE 6-34

Steve Hoober's 2013 study found that 49% of those observed used their phone with one thumb.[†]

So it's looking like the 3.5- and 4-inch screens of yore will start their inevitable decline very quickly. That means that those of us who've gotten comfortable building apps, responsive sites, and mobile-optimized web views with the old ways in mind have to learn new tricks.

[†] <https://twitter.com/lukew/status/510442401736187904>

That decline is already in motion. Adobe's 2014 Mobile Benchmark Report claims that mobile browsing among phones with 4-inch screens or smaller was down by 11 percent in May 2014 versus a year earlier (Figure 6-35).*

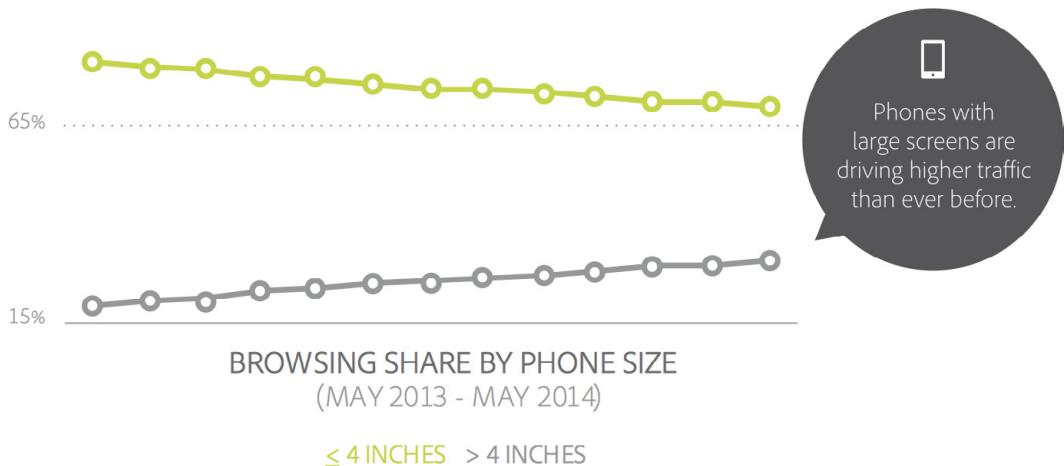


FIGURE 6-35

Adobe reported in May 2014 that phones with “large” screens (defined as being above 4 inches) are driving more Internet traffic than ever.

But this only accounts for phones sold up to May 2014. If you remember, Apple reported the most successful quarter ever of any company well...ever, in January 2015. Almost 75 million iPhones were sold, with the iPhone 6 being its most popular device.†

That means that learning how to design for thumbs is now more important than ever. Luckily, it helps that these phone display sizes are going to be practically universal. A cursory examination‡ of the most popular Android screen sizes points to a range of 5.1 to 5.7 inches.§

* http://www.cmo.com/content/dam/CMO_Other/ADI/ADI_Mobile_Report_2014/2014_US_Mobile_Benchmark_Report.pdf

† http://www.slate.com/blogs/moneybox/2015/01/27/iphone_6_shatters_sales_records_apple_has_a_great_first_quarter_in_2015.html

‡ <http://www.forbes.com/sites/gordonkelly/2014/09/04/samsung-galaxy-note-4-vs-galaxy-s5/>

§ <http://www.emirates247.com/business/technology/revealed-top-5-most-popular-android-smartphones-of-2014-2014-08-10-1.558896>

Apple's changes will make our lives easier as smaller screen sizes die off, since the iPhone 6 and 6+ clock in at 4.7 and 5.5 inches, respectively.

But why do we need to adapt our designs? As Hoober's research showed, people using their phones tend to switch their grip depending on the interface's demands. They seem to do this subconsciously, too, repositioning their hands or setting things down to take an action.

That sends up a red flag for me, though. Why should people adapt to your app? Why is your app special? Why not create app controls that are the most comfortable for most people's grips and thumb arcs?

Designing for Thumbs?

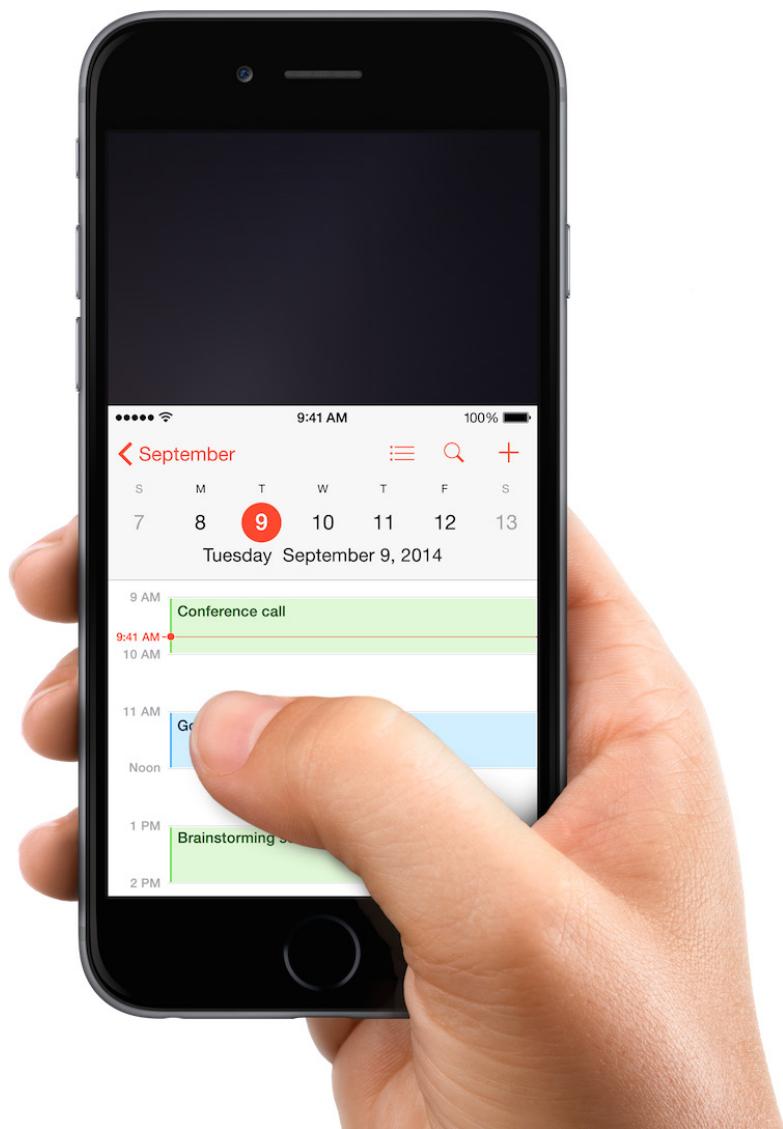
What does it mean to design for thumbs? It means building interfaces that are the most comfortable to use within our thumb's natural, sweeping arc.

But this gets complicated. Take touch screen mobile phones, for example. We unconsciously adjust the way we hold our phones to reach certain controls in various areas of the screen. During any given day, I'll wager that you stretch your grip, choke up on the phone, or angle it in ways that make reaching difficult areas easier.

But we have to start somewhere. Hoober's research suggests that most of us hold our phones in the following way—with the bottom of the thumb anchored on the lower-righthand corner (Figure 6-36).

FIGURE 6-36

Right-handed phone use means the natural anchoring of the thumb in the lower-righthand corner of the phone.



ENTER THE THUMB ZONE

This leads us to the idea of the Thumb Zone. It's a heat map of sorts—a best guess for how easy it is for our thumbs to tap areas on a touch screen.

Let's use Hoober's research to create a Thumb Zone map representing what seems to be the most common use case for touch screen use:

- One-handed use
- Right thumb on the screen
- Thumb anchored in the lower-righthand corner

Here's the Thumb Zone heat map applied to mobile phone sizes from 4 inches to almost 6 inches, measured diagonally (Figure 6-37).

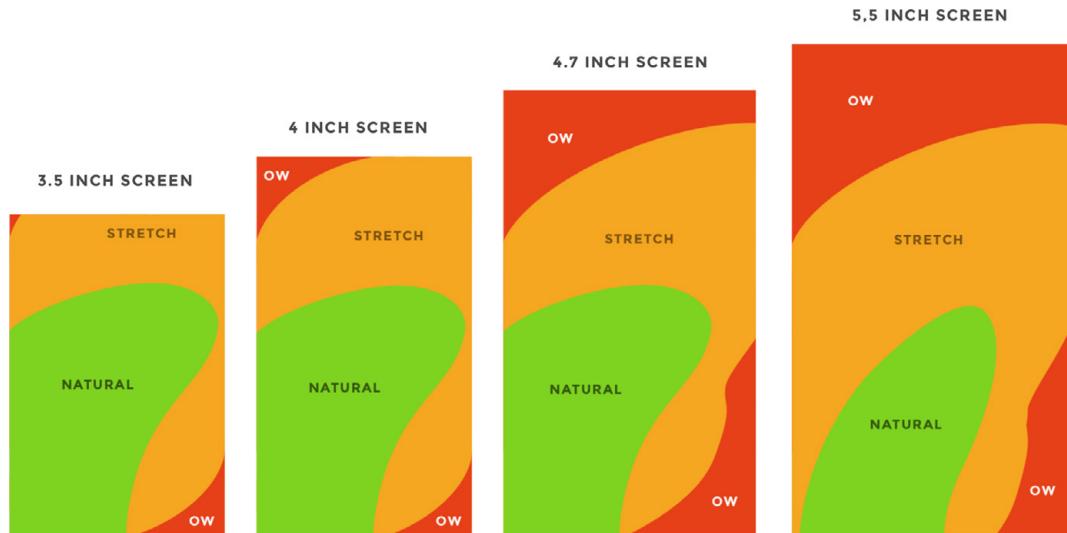


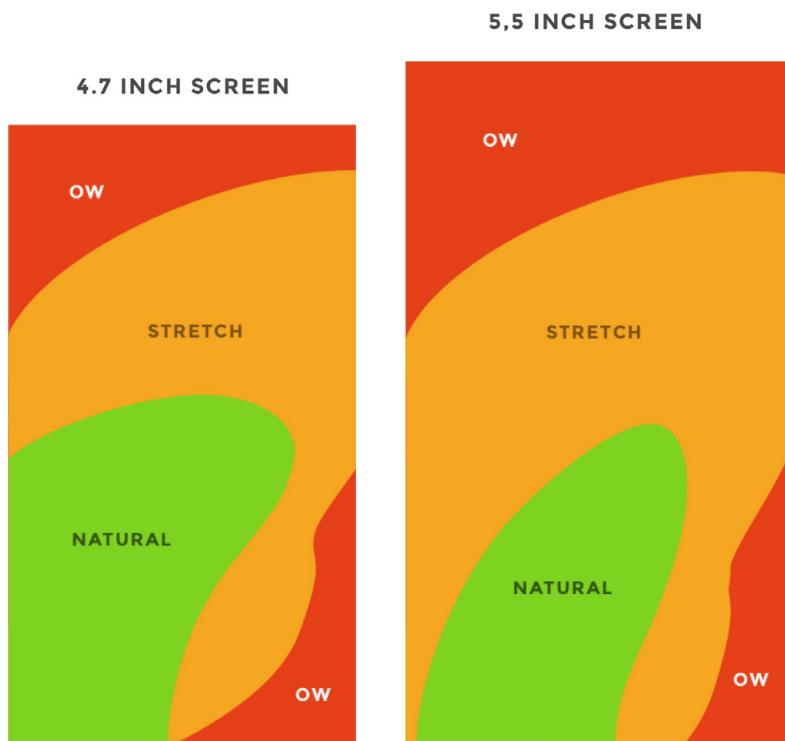
FIGURE 6-37

The Thumb Zone applied to screen sizes from 4 inches up to approximately 6 inches diagonally.

Here's a more direct comparison of large screens next to each other—4.7 inches and 5.5 inches (Figure 6-38).

FIGURE 6-38

4.7- and 5.5-inch screens with the Thumb Zone overlaid.



You'll notice that the “safe” green zone stays roughly the same (more on why the largest screen is different in a second). That's because our thumbs don't magically scale with the screen size. And that's also unfortunate, because I loved Dhalsim in *Street Fighter* as a kid (Figure 6-39).



FIGURE 6-39

Our fingers don't magically stretch the way Dhalsim's limbs did in *Street Fighter*.

But what changes is the sheer amount of “Ow” space, which becomes startlingly apparent with the 5.5-inch screen.

Furthermore, you’ll notice how the shape of the “Natural” zone changes for the largest screen. That’s because it requires a different type of grip due to its size, using your pinkie finger as a stabilizer. It surprises me how different the experience can be with less than an inch of added real estate.

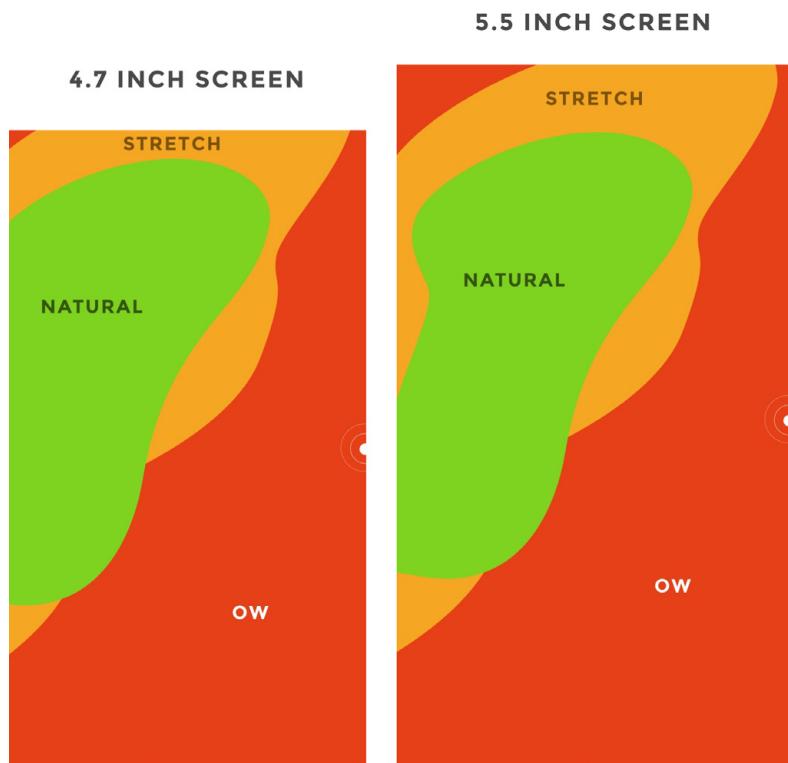
Choking up

Let’s analyze how the Thumb Zones change when you shift your grip. Sometimes you might be in a situation where it’s easier to tap the phone with your thumb’s anchor at the vertical midpoint. This is demarcated by the white dot on the right side of the Thumb Zone mockups.

Here’s an illustration of this in action for 4.7- and 5.5-inch screens (Figure 6-40).

FIGURE 6-40

“Choking up” moves the midpoint of your hand and significantly affects your thumb arc.



Notice how the larger screen actually gains natural thumb space because of its size. By comparison, the 4.7-inch screen just runs out of real estate.

Thumb-Friendly Interfaces in the Wild

Mobile screen sizes on the whole are becoming more similar, and that’s a good thing. But it also means that we can’t just treat screens above the 4.7-inch range simply as a scaled-up version of a smaller phone. Grips completely change, and with that, your interface might need to do so as well.

But how would that look? Let’s explore a few thumb-friendly interface ideas.

AIRBNB

After Airbnb’s rebranding, the home rentals app went through a redesign to place some primary actions near the bottom of the screen. Take a look at the two examples in Figure 6-41.

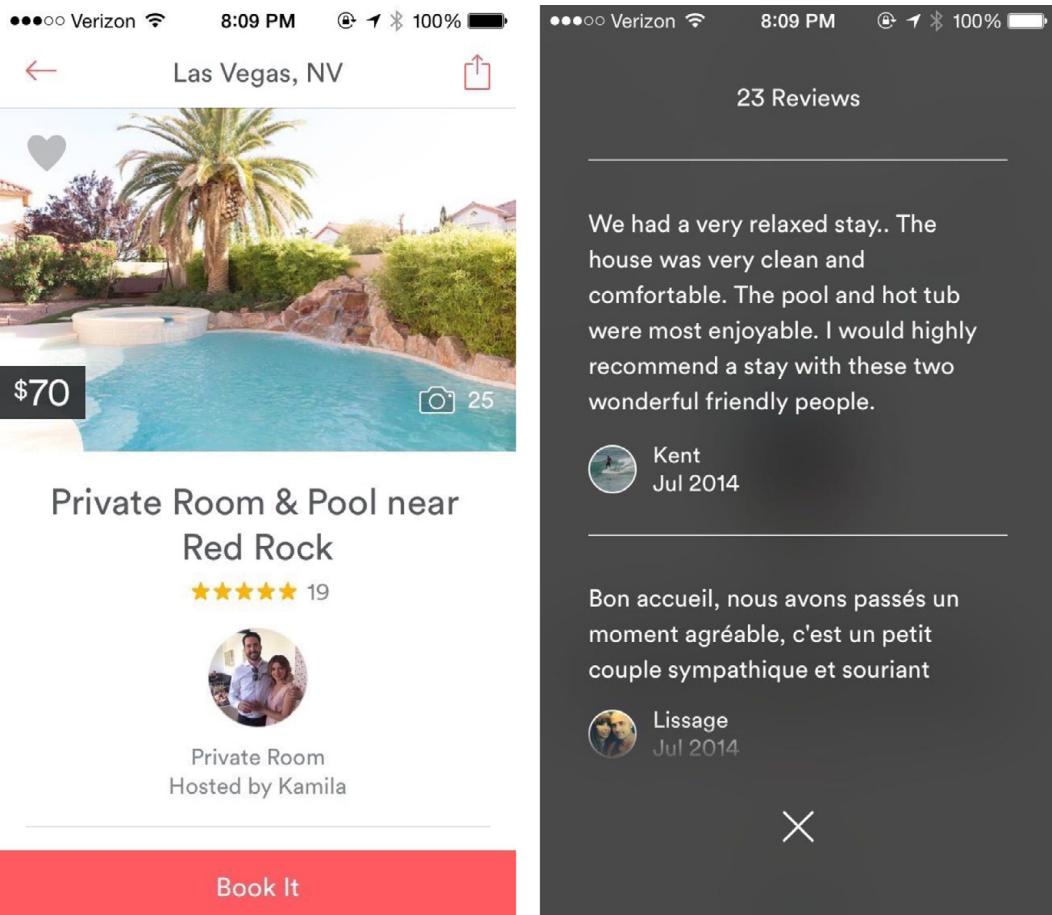


FIGURE 6-41

Airbnb's ergonomic design.

Both screens have obvious primary actions, and they don't depend on obscure gestures or OS-level controls—like Apple's “reachability” feature, which brings the top of the screen down into Thumb Zone green territory with the double tap of the home button.

Airbnb, however, does incorporate Apple's “edge swipe” to prevent needless hand stretching to reach the top back arrow.

TINDER

Tinder's primary controls are nice and obvious at the bottom of the screen, and well in the comfortable realm of the Thumb Zone. But what's even more fantastic is that swiping each card away (both "Like" and "Nope") lives in the green zone as well (Figure 6-42).

FIGURE 6-42

Tinder's a thumb heaven.



Finally, the app's been geared to respond to broader swipes for navigation—so swiping between Settings, Discovery, and your matches can be done with one hand. Beautiful.

In the end, placing controls closer to the bottom of the screen when designing for touch is a wise choice. This way, your controls are in reach of natural thumb arcs. And even if your customer cradles the phone with one hand and uses the other as their primary hand, your product will still be optimized for one-handed use. Don't forget, too, where device manufacturers place *their* primary controls: Apple's home button, Android's navigation controls, and Windows Phone's back, start, and search all rest at the bottom of the device.

Next up: how to design for an unlimited number of devices and their unique screen sizes, capabilities, and contexts.

Cross-Platform Design

There are now more mobile-connected devices than people on our planet.* And each device brings with it a series of constraints: screen sizes, input methods, hardware limitations, and more.

But it gets even more nuanced. We're using a more diverse set of devices on an individual level (Figure 6-43). In the morning, we might use a tablet, a mobile phone, and a TV. During the day, we might use a laptop, our smartwatch, and the onboard computers in our cars. And at night, we might be back to the mobile phone, tablet, and TV combination.

* http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper_c11-520862.html

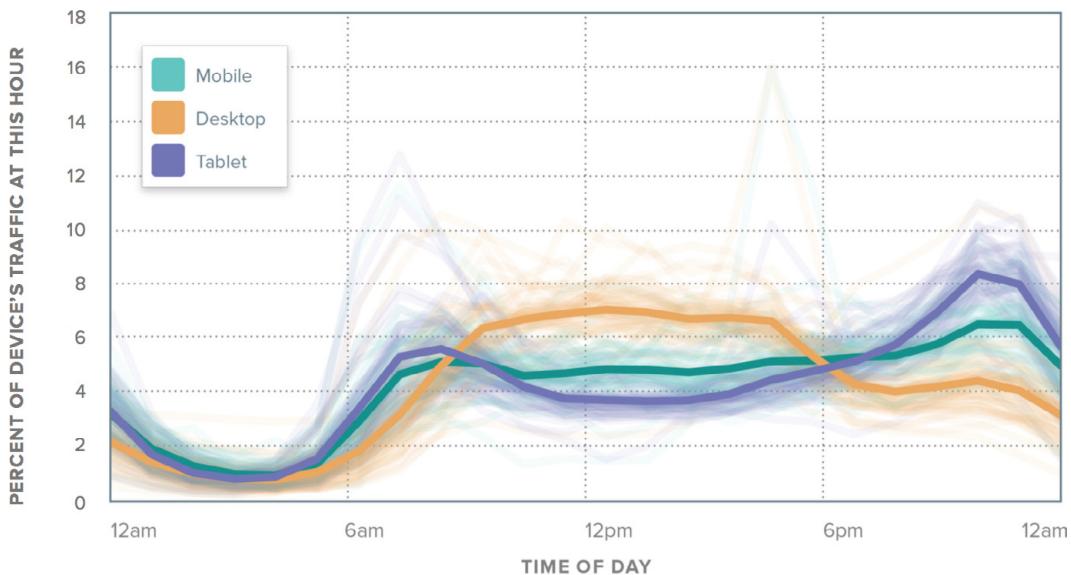


FIGURE 6-43

Charbeat's study of how device usage varies by time of day. Each type of device has a very specific usage pattern.*

With the onset of cheap, networked, and largely touch-driven devices, there's no way that we, as product designers, can predict the future. We live in a world now that already sees networked light bulbs, refrigerators, and toasters. Heck, my electric toothbrush even has a companion app. It tells me when to replace my brush head. Speaking of, I just got a push notification that I'm overdue for a replacement.

So when there's an endless constellation of devices for which we might need to design consistent experiences, how do we cope? How do we create products that are not only future-proof, but can still destroy our customers' pain on any device they decide to use?

This was a big question. And so I turned to Benedikt Lehnert, the chief design officer of successful cross-platform to-do company Wunderlist. Wunderlist spans a slew of platforms from desktop to iOS to Kindle Fire, including iPhone, iPad, Apple Watch, Mac, Android, Windows Phone, Windows, and the Web. Wunderlist was acquired by Microsoft in June 2015.

Lehnert had a few messages for us on this topic.

* Charbeat Quarterly, vol. 1 (Fall 2014), <http://bit.ly/1GKe9dq>.

What Do Your Customers Need and Expect?

“We want people to feel that Wunderlist helps them get stuff done and keeps their life in sync,” Lehnert said in our interview. That’s the core task that Lehnert instilled in his product team when setting out to build a cross-platform experience. It’s “the most important thing to formulate, communicate, and instill in your team...how it feels for people to interact with your product.”

Lehnert’s statement reflects the spirit of what we’ve been talking about from the start in Chapter 1: your product exists to find a customer, and it stays alive by solving their pains. Living on a new platform doesn’t change this unbreakable rule.

At Wunderlist, everything flows from here. “From there, you start and go into specific UX definitions and spec for each of the functionalities...we want every interaction to be as lightweight (fast and simple), easy (obvious and clear), and fun (delightful and human) as possible. The values that are formulated in our UX vision for Wunderlist shape every decision we make on flows, colors, language, iconography, etc.”

The Berlin-based company—consciously or unconsciously—infuses their product’s behavior on every platform with the things that their customers care about. Speed. Clarity. Simplicity. A little humanity. These are the commonalities a customer can expect to encounter when using Wunderlist, from iOS to Kindle Fire.

What’s Specific to the Platform?

Just because a customer might expect to have a consistent experience with your product across multiple platforms doesn’t mean that you can ignore the specifics of each operating system.

“A cross-platform product experience has to be both consistent with the core product experience as well as the platform paradigms of each operating system,” Lehnert said. “So, as a designer your job is to know and understand those paradigms in order to navigate your way through them.” Building a product for multiple platforms means that you have to respect the norms. On Android, for example, system controls are at the bottom of the device, versus a single home button on iOS devices. This significantly affects how you approach a product on mobile phones and tablets.

It's the same with every platform. Designing for set-top boxes? You'll need to know the capabilities of each remote control or controller—Roku, Apple TV, Google Chromecast, Xbox, PS4, and so on—they each have their nuances. Being intimately aware of these nuances and incorporating them into your product is an essential responsibility of a product designer.

But there's a limit. "Knowing when to follow the guidelines of the OS and when to break those guidelines in order to ensure consistency across platforms needs a certain level of experience and design mastery," said Lehnert. Ultimately, we're building a product for our customers. What are their needs? If the guidelines of the platform for which you're building come into conflict with those responsibilities, what should you do?

"Whenever we find conflicting interactions across platforms, we try to come up with a better solution," said Lehnert. "It's easy to follow guidelines. It's harder to know when to break them. We want to encourage all developers and designers to question existing paradigms and push boundaries with the end goal of making products easier and more enjoyable to use."*

One example of this is the pull-to-refresh gesture versus the refresh button introduced by Loren Brichter in Tweetie, and since incorporated into Twitter's app after Tweetie's acquisition (Figure 6-44).

* <https://www.wunderlist.com/blog/break-rules-to-design-better-products/>

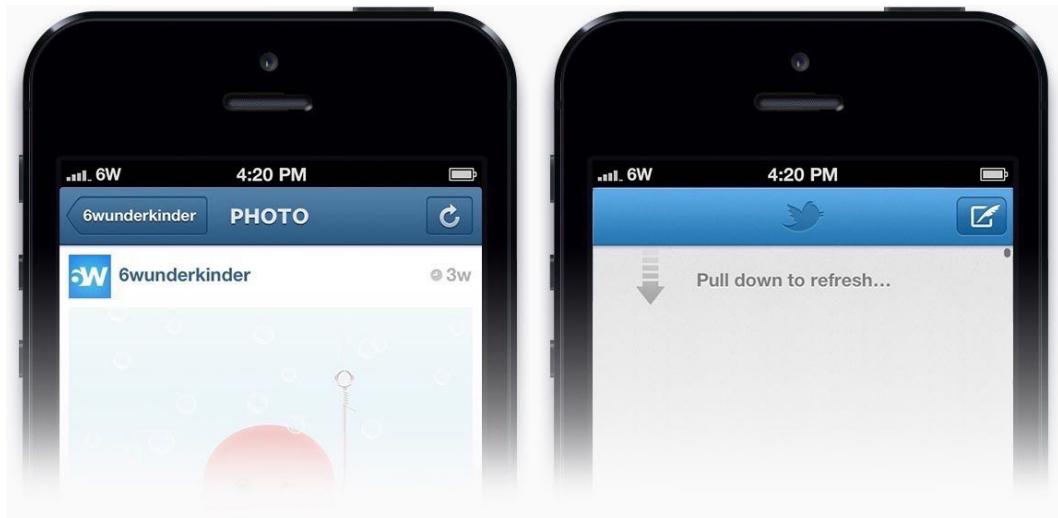


FIGURE 6-44

Lehnert compares the elegance of the pull-to-refresh gesture introduced in Twitter versus the refresh button, seen here in a previous version of Instagram.[†]

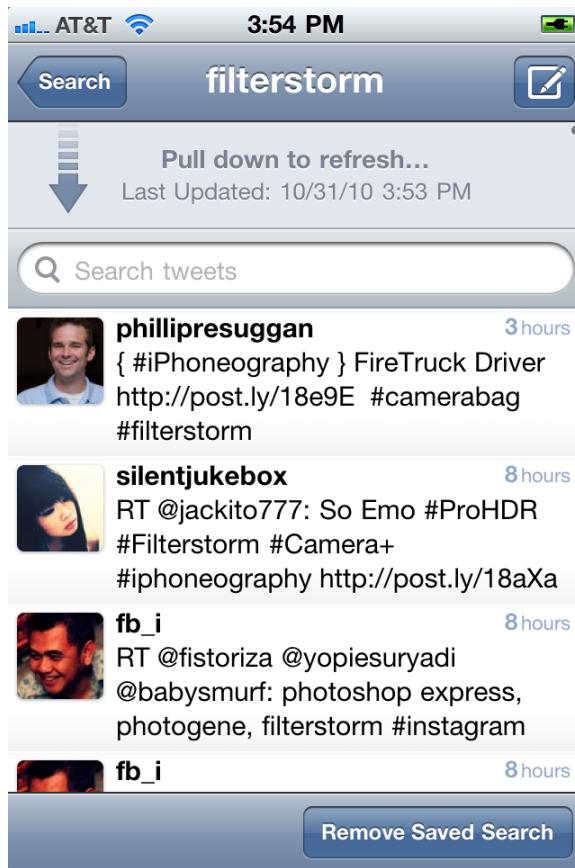
This is the perfect example of a UI evolution driven by platform constraints: in Tweetie 1.0, a refresh button would sit at the top of a user's timeline. This was borne of necessity at the time—Brichter couldn't fit a refresh button into the navigation bar. For the next version, he sought to correct this. "Why not just make refreshing part of the scroll gesture itself?" he asked himself. And so pull-to-refresh was born (Figure 6-45).[‡]

† <https://www.wunderlist.com/blog/break-rules-to-design-better-products/>

‡ <http://www.macstories.net/news/loren-brichter-talks-about-pull-to-refresh-patent-and-design-process/>

FIGURE 6-45

The pull-to-refresh in action in Tweetie.



What Are the Use Cases for Each Device?

The same version of your product isn't going to exist on every platform. What are people trying to accomplish on their devices? When are they using them? A product that's tone deaf to these considerations can easily blow it.

I love how Lehnert characterizes this notion. "Wunderlist is a part of our user's life on multiple devices and platforms every day," he said. "Our goal is to escalate Wunderlist from mere software to a character, a helpful friend, that is there when our users need or want it. An authentic character that is opinionated and infused with our values and which evolves over time in the way it looks, works, and speaks. That's what inspires people and makes them fall in love with our Wunderlist."

He knows the expectations that his customers have for Wunderlist in each unique situation, and they build the product on each platform to meet those expectations. “We want to get a deep understanding of what needs and demands people have in certain situations, and how we can cater the product best to their needs.”

So that’s why, for example, there’s not a full-fledged, bloated version of Wunderlist running on the Apple Watch. Instead, it’s a stripped-down, lean piece of software that tells someone only what they need to know, when they need to know it (Figure 6-46).



FIGURE 6-46

Wunderlist’s contextual Apple Watch app in action.

“One of the most exciting things about Wunderlist for Apple Watch is the hands-free experience in situations where you would have had to juggle your phone,” Lehnert wrote. “Whether that’s going through the supermarket and checking items off your grocery list or, soon, using smart voice input to add to-dos for tomorrow’s meeting.”*

* <https://www.wunderlist.com/blog/designing-wunderlist-for-apple-watch-from-benedikt-lehnert/>

Remembering what your customer expects, respecting—and breaking, when it matters—a platform’s paradigms, and understanding the specific use cases of each platform are principles that are going to benefit any product in the coming years. The number of screens, devices, and contexts is only going to increase.

That concludes our exploration of the mechanics of interface design. Let’s review what we’ve discussed and move onto what goes into the psychology of an experience.

Shareable Notes

- There’s a push and a pull between interface copywriting, pixel-perfect mocks, and functioning prototypes. If they were all on a spaceship together, they’d be the directional thrusters responsible for lining up the ship for a clean seal on the airlock.
- Eventually achieving pixel perfection in your mocks—or whatever you call them—is still a requirement. You’re still going to need the “hero” version of your product’s interface, regardless of the internal living document that is your product plan and milestones—call it a spec, a user story, or whatever buzzword your people use.
- Pixel-perfect mockups are the ultimate communicator, because they can be integrated into your prototypes and filled out with the real copy you’ve already created. Suddenly, you’re fooling everybody that this is a real product. Disbelief is suspended, and true opinions flow out. On top of that, pixel perfection, combined with prototypes, is the ultimate guidebook for engineers. But don’t forget: these are most effective after you’ve written out the user flows and created working prototypes. Otherwise, you heavily risk a flow that falls flat. Too many of these, and you risk a *product* that falls flat.
- “Awkward UI” is a missing loading indicator. It’s forgetting to tell your customer where something went wrong (bonus points for doing so with a scary error message). It’s a graph that looks weird with only a few data points. It’s a linear *snap* into place when a new piece of data is introduced.

- Awkward UI can be alleviated with the UI stack. The UI stack is a combination of five states of interface design—ideal, empty, error, partial, and loading—and how a customer moves seamlessly between each state.
- Design for ergonomics with the Thumb Zone. It's a heat map of sorts—a best guess for how easy it is for our thumbs to tap areas on a touch screen.

Do This Now

- Which pieces of your product's interface are jolting and scary? Apply the principles of the UI stack to every screen of your user flows. See what you're missing, and what you can make more communicative.
- Apply the Thumb Zone overlays to your product's designs. How many of your product's primary controls rest in the easy-to-reach areas?
- Rethink what you know about layouts. Adapt them to the various devices used by your customer base. Refer to Luke Wroblewski's excellent "Responsive Navigation" piece for inspiration.*
- It might be worth conducting your own study of your customer base. How do you observe them holding their phones? What's the context in which they'll be using your product, and what are their hands doing?

* <http://www.lukew.com/ff/entry.asp?1649>

Interview: Diogenes Brito

Diogenes Brito is a product designer and a developer who's worked at Slack, LinkedIn, and Squarespace. He can be found at <http://uxdiogenes.com> and on Twitter at <https://twitter.com/uxdiogenes>.

I just wanted to start out by talking about a post you wrote awhile ago entitled “On Being a Designer and a Developer: Not Quite Unicorn Rare.”^{*} You have this very lucid, clear way of breaking down what can be fuzzy, multidisciplinary roles required of a designer and a developer.

Obviously people are very interested in this intersection between design and development. I wanted to ask you what led you to your conclusions, where you talk about how good designers and good developers have a lot in common. I would just love to walk through that thought process.

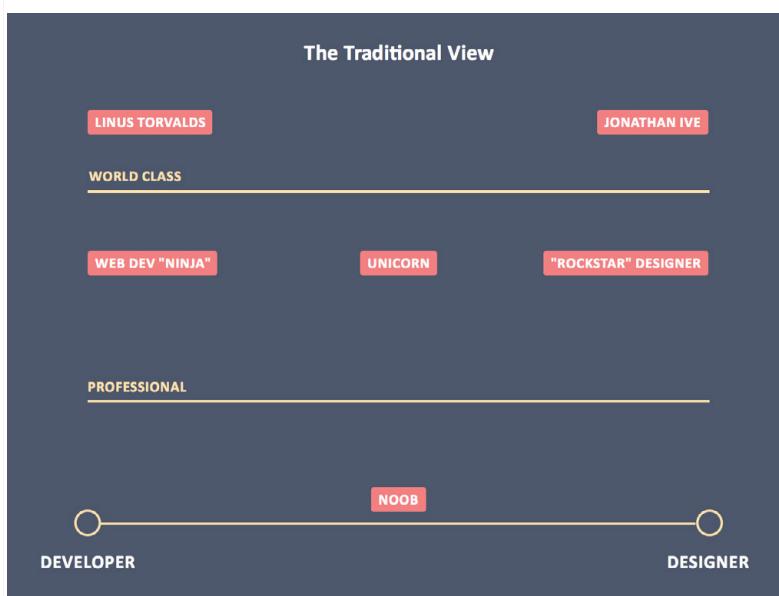
Sure. It's something that I've been thinking about for a long time, albeit not super clearly, I would say. Partially because I'd always wondered if it was an OK goal, because I was on the fence between design and development. I wanted to do design, but the only way to really accomplish that was to build these things myself.

When you're a freelance web developer and you're a one-stop shop for a client, you have no choice but to do both sides. Once I had that skill set, I was thinking, am I allowed to pitch myself this way? Is that something that even, people will respond to, or they just won't believe me out of hand? It's not a real thing to be both designer and developer.

It's been a struggle, of course, but I think what really cracked it open for me, I'd say, was that Austin Bales talk that I referenced actually in the post.[†] I had this idea, actually—the diagram came way before the post. The post grew around the original diagram, which is this spectrum.

* <http://uxdiogenes.com/blog/on-being-a-designer-and-a-developer-not-quite-unicorn-rare>

† <https://vimeo.com/61113157>

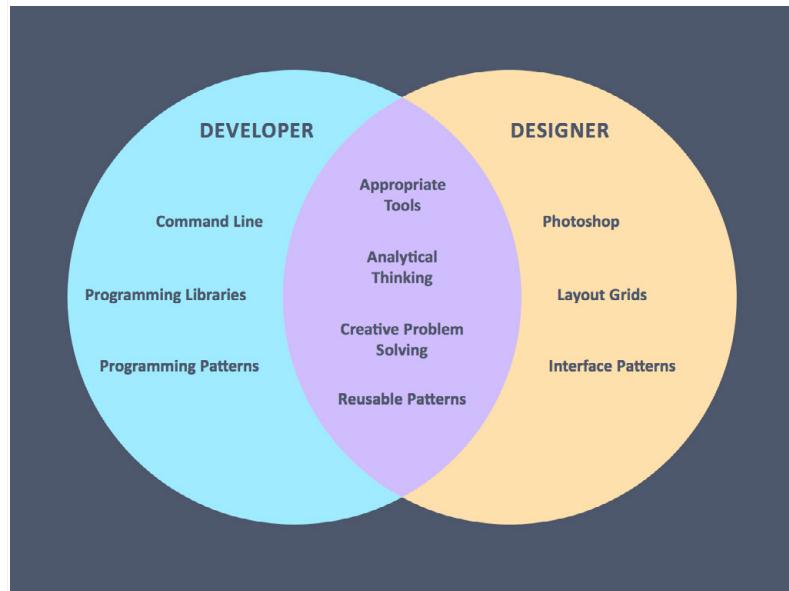


I was thinking what is true about the way people consider design and development being diametrically opposed.

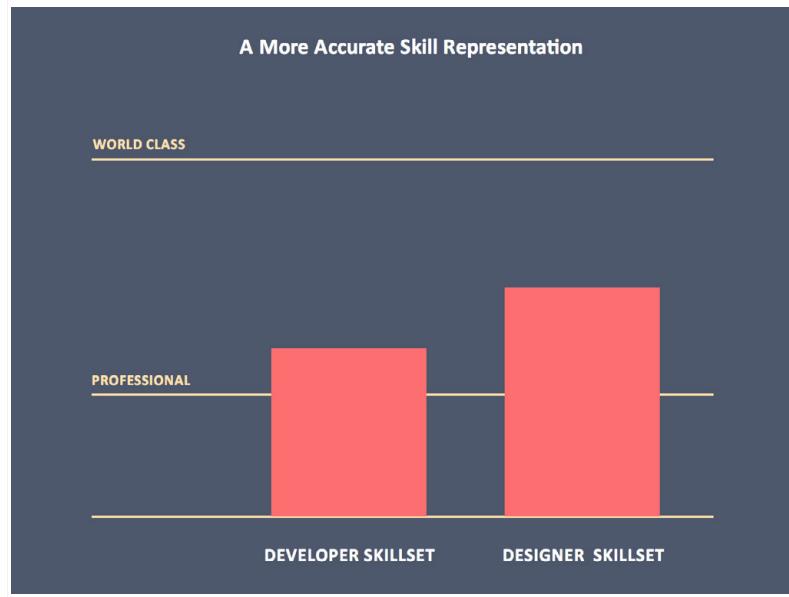
I think that it's like he said, that in some cases it is an artist versus, I don't know—I can't come up with a good example. What did he say? He said barista and rocket scientist, I think...

Because all the examples I could come up with actually still had stuff in common. I was about to say an artist or blacksmith or something. That doesn't actually apply, because a blacksmith is both.

After just listening to his talk, I was thinking yeah, the reason you can be both is not because you can be two people—because you can't. There's a limit to how much time you have and how good you can be at anything, really. But because there's so much overlap, and I think of the skills required of making you a good, professional-level designer and developer, because they overlap so much, I think you can do both. It's to your benefit if you can do a little bit of both.



Then I think that leaves the last problem of getting other people to believe, or seeing how that fits in the general marketplace. Because part of the problem is you can only be both of these people when you're in a small development shop, a small startup, a one-man operation.



Each person has a certain level of skill in the designer and/or developer subject areas, where many of the skills and habits that would make you excel in either area would help in both. People may have a tendency to lean towards one area over the other, but no one has a “type” that would prevent them from learning and improving as a designer or a developer. What matters is the time and effort put into learning.

Once you get into a larger company where people start to specialize, it's not something you can really pull off successfully as far as selling to other people.

Yeah, and that last point's interesting, because I've always had an urge to be like “Oh wait, no, no, I can do both.” Is there a point where you have to be boxed in? How do you deal with that?

See, that's the thing. The way I see it is the reason I put that professional level and that world-class level on there was because I think you can get to a professional level, and you can be really good at both. But if you want to be really world-class, you have to skew in one direction.

That's because world-class musicians, they have one instrument. You know what I mean?

They can play multiple ones, but they're known for this one instrument. I think it's the same deal with being a designer or developer. To really get to a really, really high level, you need to have an in-depth knowledge of your medium.

There's the principles and all that stuff, and a lot of that overlaps, but to be really, really good, you have to know your medium. You have to be in that community. You have to stay up on the latest trends and this, that, and the other. It's pretty difficult to do both of those things at the same time.

You can be professional and you can even do both at work, but I would say I started more as doing frontend stuff actually at Squarespace, and not as much design stuff. Now I've flipped the ratio.

It is difficult to switch modes mentally, from more convergent thinking to divergent thinking. You need time when you're doing design. How do I describe it?

Some things are different enough that it's difficult to switch back and forth or do both simultaneously. Both of these skill sets can be stored in the same person, but you're going to be using each, you're going to be using only one at a time, and then switching back and forth as you go.

The things that'll make you good at one will also make you good at the other. What I mean there is, think of the example of something like staying up late and coding. You can hammer on a problem and just keep going into all hours of the night, and work on this development problem. It's totally the opposite, I think, for design. Where you have to be in a sort of mindset where staying up late or doing any of that isn't really going to help you past a certain point.

I guess the same is true in some respects about development. You're putting yourself in a different place creatively when you're working through a design problem versus working through a development problem.

Switching back and forth between those two kinds of problem solving is, a single person can do it, but in order to do both of those things well—for example, at your job, on a continuing basis, you have to do a couple days of one and then a couple days of the other. Not "I do this for an hour and do that for an hour" kind of thing.

You've definitely got this thirst for research, real raw research, about behavior and the effect of aesthetics on trust and even usability. What are you dialing into these days? Or do you have any authors or professors or thinkers that you like to track? What kind of areas do you spend time investing in and soaking up?

Part of this is a result that psychology was part of the curriculum, but once you know a couple of these basic sorts of heuristics and tendencies that people have, they come up again and again in design. You've got to keep your eyes open for other indications of that same sort of thing happening.

It is a good idea to keep an eye on, I guess, published psychology journals. Really, a good way to get overviews actually of what you might want to read more into is some of those pop psychology books like Malcolm Gladwell.

I think I started back in the day with Don Norman's *Emotional Design*, and that really got me thinking of how some very basic animal tendencies we have should inform the way we design.*

It's like what makes economics interesting. If you make the assumption that humans are rational, there's a bunch of conclusions that follow. Real life will show you, and any economist will tell you, that humans aren't rational. There's loss aversion, and there's all this not mathematical stuff that we do because of how we feel emotionally.

* <http://amzn.to/1IViojz>

[I was reading Jim Collins's *Good to Great*, where] he talks about the Hedgehog Concept—which is this one vision to align the company with, but it's not really just the fact that there's a vision to align the company with, but the fact that there's this vision you actually can execute, and you guys are passionate about it and this, that, and the other.

It's easy to see how that idea connects to what you would find in a normal design process when you're searching for insight about what you should do with a particular feature. Like what does the product that this feature's going to be in represent to the user? What can be the best connection between this new feature and what already exists in the product and what people are familiar with?

It all wraps together. It's like different facets of the same idea, trying to figure out what people are about and what they're motivated by. Reading any of those books in general that are informed by—they have good analysis, but they also have good data. That just does, I think, wonders for your ability to think about the craft.

That reminds me of another book. It's a book called *The Humane Interface*, by Jef Raskin.*

What he says, basically—what the whole book is really about—is that an interface should be humane. Humane means that it is considerate of human frailties. It's responsive to human needs and considerate of human frailties.

One thing that he says in the book somewhere, it's like, "consider your users smart but busy." He also says that you should always be focusing your design efforts on intermediates, because everyone goes towards intermediacy. Beginners don't like to feel like beginners. No one likes to feel incompetent, like they don't know what they're doing.

They want to quickly blast by being "noobs" to knowing what's up, being intermediate. Then experts, you need to be able to do expert things, and if you use this thing every day all the time, you need to be able to do things quickly. Really, most people are going to be somewhere in the middle.

Even if you're an expert, the minute you start spending time away from this thing and doing something else, you don't use it for a while, you regress back into being an intermediate. That's where your main design efforts should be.

* <http://amzn.to/1fjCtWj>

He's got so many great things in there, but that is a guiding principle I always think of. Making the interface humane, such that yes, your users are smart, but no, they're not always paying attention. They're not always ready to commit X part of their life to this random application. Maybe they have children, or they have so many more important things in the grand scheme of things.

You need to be OK with that. Sometimes you have to let some decisions that you like go. I don't know what a good example is, but sometimes, you want to make this whole thing a little bit more aesthetically pleasing, so you're going to remove the text and just have this icon that's abstract there.

It'll probably work fine, and people will try it out. They'll figure out what it does. The other option is, don't do that. It may be a little bit more on the interface, but it's perfectly clear; they don't have to think about it. They don't have to wonder what's going on. You don't have to give them that feeling of them not being good at using this interface by just putting this label there, and letting them [flounder].

There's a fine line, I guess, between not patronizing someone, but also realizing that they're not necessarily a student of interfaces, or interested in learning at all. Because they just want to get X thing done before they move on with their life.

The thing to focus on is that 100 percent of your users are humans. While technology is changing really, really rapidly, human motivations basically haven't at all. Like Maslow's hierarchy of needs, that's still the same.

Designing around that, the closer you are to the base level of what humans desire, the more timeless it'll be. This idea of immediate feedback of some sort with tactility and the idea of affordance where something, while looking at it, it tells you what it does, that's so basic that the better it is at doing that, the longer it'll last.

I love that quote: the more you focus on human desire, the more timeless it'll be.

The closer [your product] is to that, fulfilling some sort of basic human need, the longer it'll last. And it's funny, because you see the same design thing happening over and over again in each new technology.

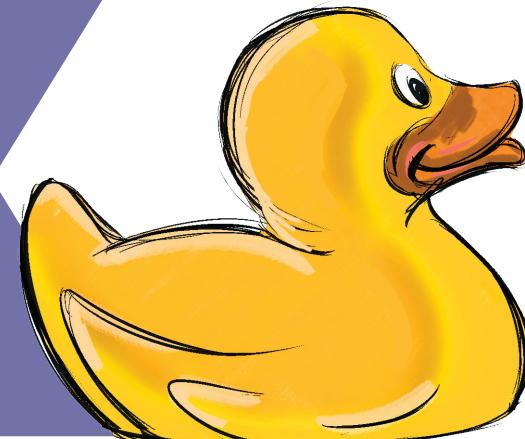
This interview has been edited for length, and you're missing out on thousands of words of insights. To read the interview in its entirety, go to <http://scotthurff.com/dppl/interviews>.

"Joel Marsh bends the UX learning curve back to earth, providing practical lessons that will give you a solid start in UX design."

—Aarron Walter
VP of R&D at MailChimp, Author of *Designing for Emotion*

UX FOR BEGINNERS

A Crash Course in 100 Short Lessons



JOEL MARSH

VIII

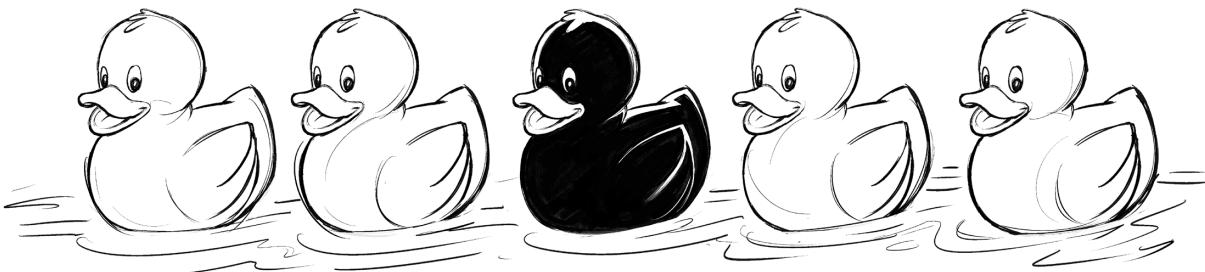
Visual Design Principles

Visual Weight (Contrast and Size)

This lesson is the first of five visual principles that will help you direct the user's attention. Some parts of your design are more important than others, so we have to help users notice the important stuff.

The idea of visual weight is fairly intuitive. Some things look "heavier" than others in a layout. They draw your attention more easily. And that idea is valuable to a UX designer. Your job is to help users notice the things that matter. And it is equally important not to distract the users from their goals.

By adding visual "weight" to certain parts of your design, you increase the chance that a user will see them and you change where their eyes will go next. Remember: visual weight is relative. All visual principles are about comparing a design element to whatever is around it.



THE CENTER DUCK DRAWS YOUR EYE MOST. CONTRAST EFFECTS VISUAL WEIGHT.

So, without further ado, I would like to introduce you to the stars of the UX Crash Course: The Rubber Ducks! *applause here*

Contrast

The difference between light things and dark things is called *contrast*. The more distinguishable a light thing is compared to a dark thing, the "higher" the contrast.

In UX, you want to give important things higher contrast, like the duck in the center. In this case, most of the image is light,

so a dark duck is more noticeable. If the image were mostly dark, the lighter duck would be more noticeable.

If these were buttons, more people would click the dark one than if all the buttons were the same color.

Depth and Size

In the real world, we notice things that are close to us more than things that are far away.

In the digital world, bigger things are perceived to be closer, like the middle duck in the second illustration, and something that is smaller is perceived to be farther away (like the blurry duck in the back.) If the ducks were all the same size, you would probably look at them from left to right (assuming you read that way).

If you use blur effects or shadows it just makes the perception of depth more realistic. Size has this effect even if your design looks "flat."

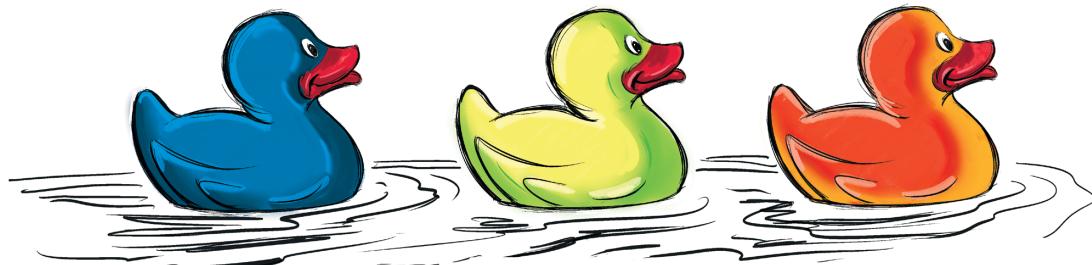
As a general rule, you want more important things to be bigger than less important things. This creates a visual "hierarchy" on the page and makes it easier to scan, but it also allows you to choose what the user notices first. That's why it's wrong to "make the logo bigger," unless you want users to stare at your logo instead of buying something.



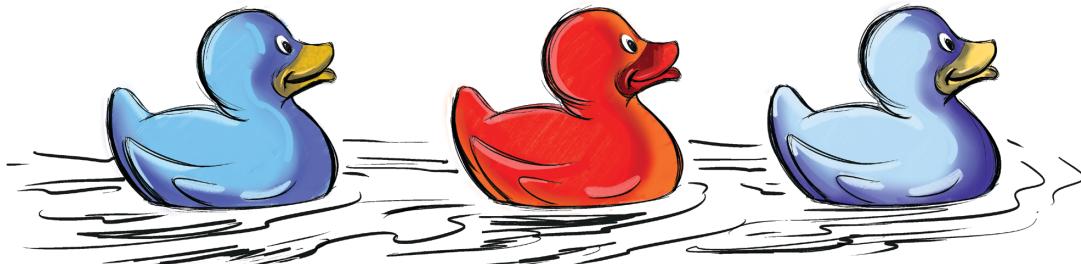
THE FRONT, CENTER DUCK ATTRACTS MORE ATTENTION. DEPTH AND SIZE CHANGE VISUAL WEIGHT.

Color

Real life is full of sunlight, artificial light, heat, cold, clothing, brands, fashion, and a million other things that affect the way we perceive colors. As a UX designer, we might not care about Pantones and brand guidelines, but we definitely have to learn about color.



WHICH DUCK LOOKS COLD? OR LIKE A WARNING? COLOUR HAS MEANING.



WHICH DUCK SEEMS TO COME FORWARD? COLOUR CAN REcede OR ADVANCE.

There are a few things we can learn about color from the Technicolor rubber duckies on the preceding page. As UX designers, we usually rock the wireframes in black and white. And that's a good thing! We focus on the function, while the UI designers can focus on the look, feel, and style. However, sometimes color is function. Like traffic lights, or making the color of a popsicle match the flavor. You know, important shit.

Meaning

In the first illustration in this lesson, we see three ducks in different colors: blue, yellow, and red. They're so handsome. Immediately, these ducks seem to have different tonality, and it is easy to imagine how the colors can change what each duck "means."

If the ducks were buttons, they might be "confirm," "cancel," and "delete." If they were indicators on a fuel tank, they might represent "full," "half," and "empty." Or if they were on a stove: "cold," "warm," and "hot."

You get the idea: the ducks are identical, but colors change the meaning. If you don't need to indicate something like that, let the UI designer choose colors. But if you do, let your wireframes do the talking.

PROTIP

Don't argue with other designers about the specific shade of color. In UX, pale red and primary red are both red. That's all you care about.

Recede or Advance

The other thing to keep in mind is that colors can be "loud" or "quiet." The second image in Lesson 52 shows a red duck and two blueish ones. The red duck almost looks a little closer, doesn't it? It's not. Something like a "buy" button should have a color that makes it jump off the screen. More people will click a color that "advances" (comes forward).

On the other hand, sometimes we want things to step back so they are visible, but not too distracting, like the two blueish ducks. They "recede" (sink backward). This is good for something like a menu that is always on the screen. If it is always yelling at you, that's unnecessary and it steals focus from more important things.

Keep Wireframes Simple

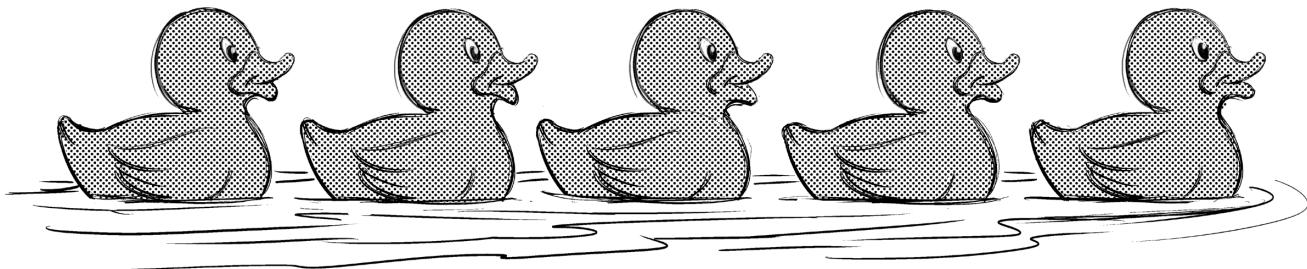
Colorful wireframes just get in the way of the functional details. Use colors where they matter, but don't make your wireframes blue like blueprints, or dress them up for clients. It makes all discussions about color confusing: "No, the website won't be blue..."

Combine Visual Principles

Color can work really well with the previous lesson about Visual Weight. Something big is noticeable, but you can't miss something big and red! Make your errors and warning labels red and high contrast. Or, if you're just confirming what the user did, something a little smaller in a receding green might be perfect.

Repetition and Pattern-Breaking

One important visual design principles involves the creation of patterns to move the user's eyes to important things. And like all good rules, patterns are made to be broken.



THESE DUCKS CREATE A PATTERN. REPETITION CHANGES PERCEPTION.

Who knew we could learn so much from rubber ducks?!

Human brains have a particular talent for patterns and sequences. Whenever something in nature happens over and over, we will quickly notice. In fact, we don't just notice, we think about those things differently.

The first image shows five identical rubber ducks in a row. We don't see five individual ducks though, we see a row of ducks. We treat them as a group or a sequence, and if you live in the

Western world, you will probably look at them from left to right because that's how we read. If that row of ducks were a menu or a list, we would do the same thing. Therefore, you could expect more people to click the options on the left, and fewer people to click the options on the right.

Breaking a Pattern

The second image shows the same five rubber ducks (still lookin' good, aren't they?) but this time one of them has gone solo. We'll call her Beyoncé.

That changes everything. Now we see a row of four (jealous) ducks, and Beyoncé is alone, in the spotlight. She woke up like that! It is hard not to focus on Beyoncé, even though all five ducks are equally majestic creatures.

Now, if that were a menu, the middle option would get far more clicks than before because our eyes fixate on it. Also, those clicks would be stolen from the left options, so the left options would be less popular than before (although probably still more popular than the far-right option).

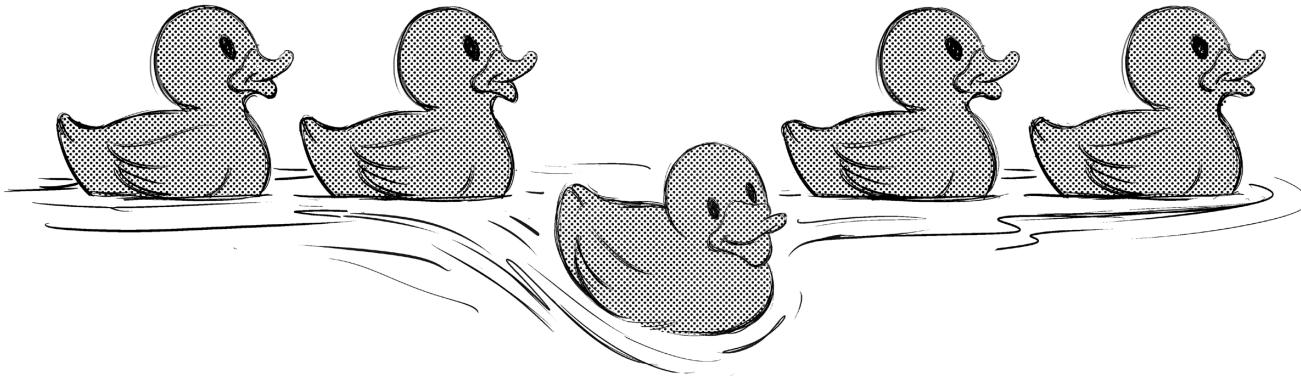
That's a powerful thing to know.

This might seem simple and obvious, but when you apply that principle to your designs—or your dance routines—it can make people notice the important buttons, options, or pop stars.

Be careful: pattern-breaking can also lead the user's eyes away from other important things. Before you can break a pattern, you have to make one.

Combine Your Principles

To make a pattern or a sequence, keep visual weight and color consistent. The user's eye will start at one end and follow the pattern to the other end. To break the pattern, just switch it up in the place where you want to add focus. Make the "Register Now" button an unexpected color, size, shape, or style, and watch your clicks go up overnight!



WHEREVER A PATTERN IS BROKEN, THAT'S WHERE WE FOCUS.

Line Tension and Edge Tension

Repetition, as we learned in the last lesson, creates a pattern. However, certain types of repetition can also create the perception of shapes that affect where the user's eyes will go.



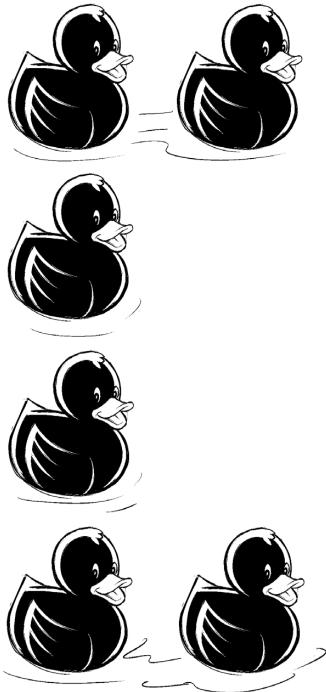
YOU SEE A LINE OF DUCKS WITH A GAP. WHY DON'T YOU JUST SEE 8 DUCKS?

Are you tired of the ducks yet? I didn't think so.

Visual "tension" is a concept that seems very elementary, but you'd be amazed how useful it can be. Our brains are a little too good at seeing patterns where they don't exist. As a designer you can use that.

Line Tension

The first image shows eight ducks in a row. We don't see eight individual ducks; we see a line. That's line tension. The perception of a line or a "path" when there isn't one. Our eyes will follow the path to see where it goes. Super useful.



DO YOU SEE 12 DUCKS, OR A BOX MADE OF DUCKS? THAT'S EDGE TENSION.

If we break that path—like any broken pattern—the gap steals more focus.

Edge Tension

So far, we have assumed there is only one line. But what if we create line tension using more than one line?

The result can be “shapes.”

In the second image, I have arranged the ducks so they appear to form the corners of a box. You could see 12 ducks, or four groups of 3 ducks, but your mind really wants to see the box, so it does. Furthermore, now we can put things “inside” the box (like more ducks!), or in the spaces between

the corners. Similar to line tension, edge tension brings focus to the gaps.

Layout-wise, this can be an excellent way to put more focus on something small, like a label. Or you can create visual paths leading to the button you want people to click. Vintage ads use this technique often to put a small logo in focus. And conveniently, it makes a layout feel simpler and more cohesive because a path or a box is only one mental thing, but 12 separate ducks is too much awesome to handle.

Combine Your Principles

In this lesson I have left the “tension” gaps blank, but you don’t have to. You can also use color to create a path like a gradient on a list of items. Or you can add visual weight to a group of elements by treating them like one shape instead of separate pieces. It’s a great way to direct the user’s eyes without adding any more things to a layout!

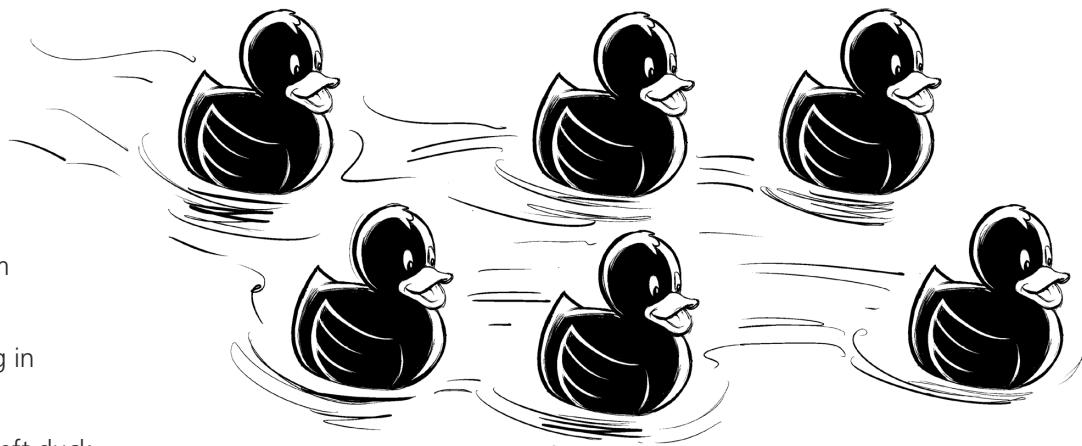
Alignment and Proximity

The last design principle you will learn about is how to add order and meaning to elements of your design without adding any more elements. It might sound subtle, but it affects everything you see, every day.

Alignment

In the first image you see a group of six stunningly beautiful ducks, but you also see a lot of relationships because of the way they are aligned:

- We see two rows.
- The far-left and far-right ducks seem to be separated.
- The two center ducks seem the most organized.
- All ducks seem to be going in the same direction.
- If you see motion, the far-left duck might be falling behind.



- If you see motion, the far-right duck might be leading.

Those six ducks are identical. Only the alignment creates these perceptions. Buttons with similar functions can be aligned.

Different levels of content can be aligned. Information can be in a grid of rows and columns like a spreadsheet to create complex meaning.

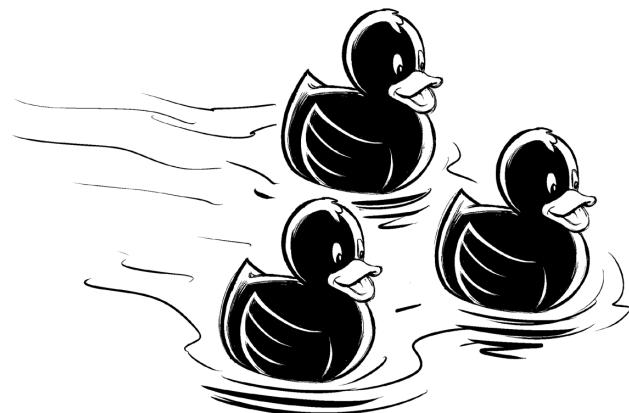
Proximity

The closeness or distance between two objects creates a feeling of those objects being related or unrelated. That distance is called *proximity*.

In the second image, you see six identical ducks that are not aligned horizontally or vertically, but you definitely see two

groups. The ducks in each group seem together, like a team or a family. The only thing creating that perception is their proximity.

In your designs, put related elements closer together and unrelated elements farther apart. For example: a headline, a block of text, and a button that are all related to one action—like a purchase or an app download—are usually designed like a “package.” That allows the user to understand that they go together without reading anything.



THE CLOSER THE DUCKS ARE TO EACH OTHER, THE MORE RELATED THEY SEEM.

Using Motion for UX

In digital design, it is becoming more and more common to include animation or motion design as part of the UX. It's a stylish detail, but in UX, you care about more than style. Motion is a tool.

If Motion Makes People Wait, It's Bad

Before you start designing amazing transitions between screens, and smooth animated buttons, and parallax gravity in your scrolling, think about the user. If the user is trying to navigate, or if they know what is coming, or if they have to see this animation a hundred times every time they use your site or app, you might be doing more harm than good.

Animations take time to show, and making users wait quickly gets frustrating. Even worse than waiting, sometimes animations make things hard to read, or they distract users from the content and buttons you want them to read and click.

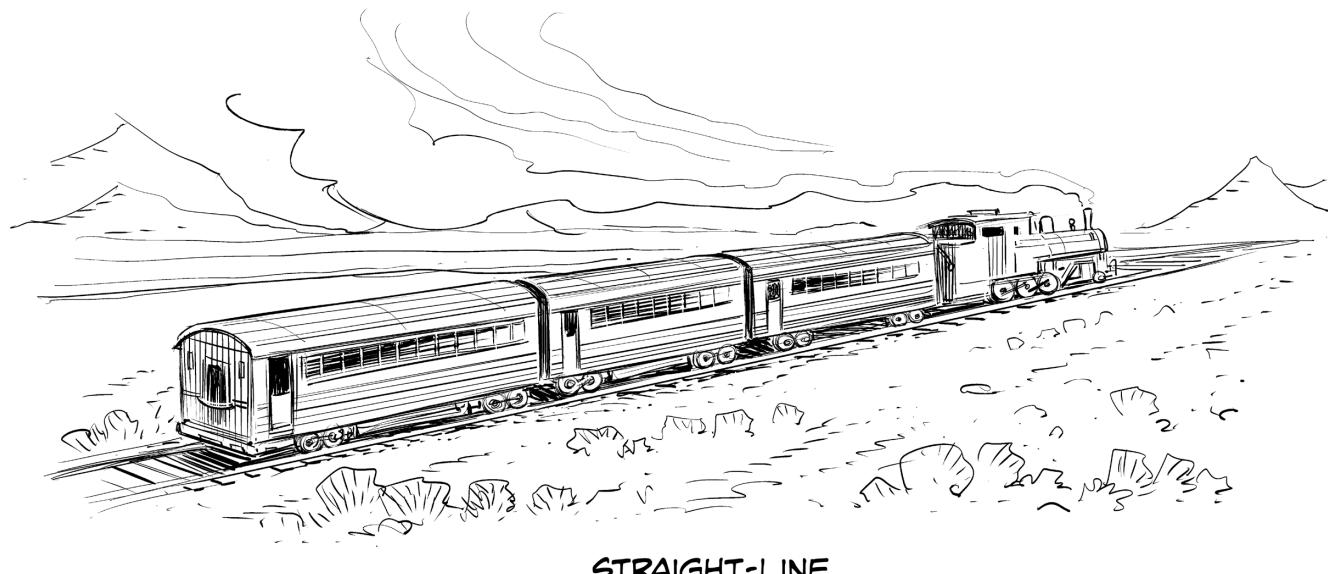
Motion Is Noticed First

If you have ever been disturbed by a vibrating banner or a jumping button, then you understand how motion can draw your attention. If you made a list of the things your brain notices, in order of priority, motion would be first. But, a little goes a long way. If you make a vibrating banner or a jumping button (which are really annoying to click, by the way) I will hunt you down and... well... let's just say it won't be pretty.

Straight lines point in a direction

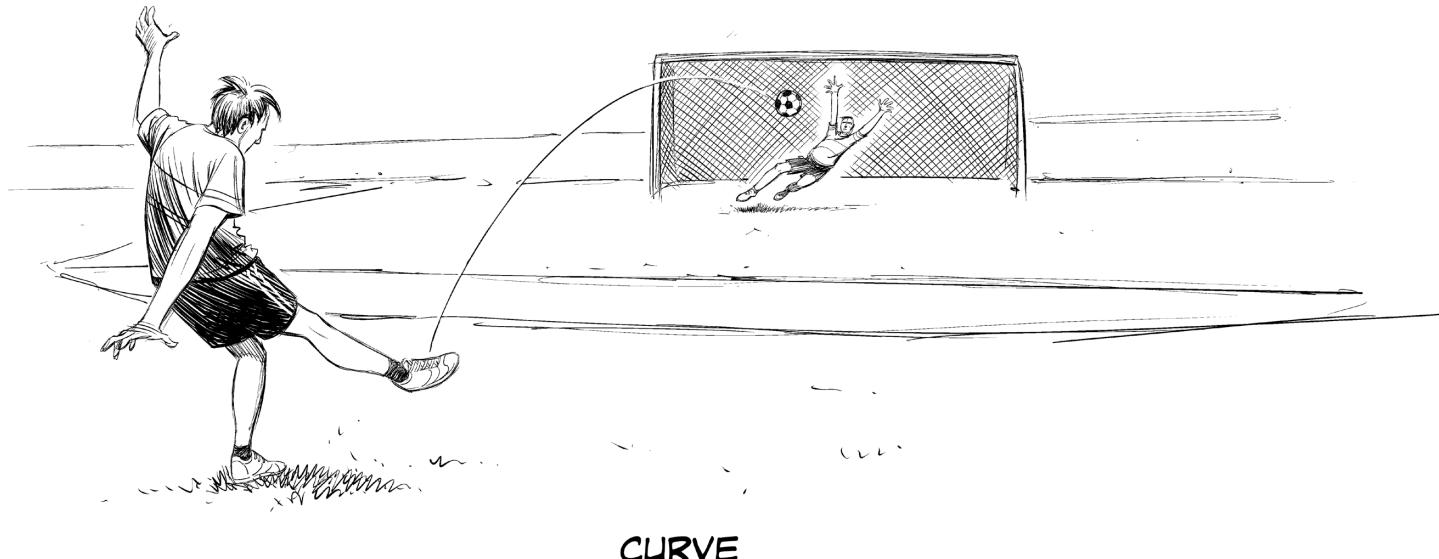
Different types of motion will do different things to the user's eyes. If you make something move in a straight line, the user's brain will anticipate where it's going and the user will look at

the "end of the line." If you are using motion to highlight key features or tell users where to go, straight lines are a good choice.



Curved lines make people follow the curve

However, if you want to lead users around the screen—like when you’re explaining your app for the first time—curved motion will make their eyes stick to the path and stop where the animation stops.



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THIS IS SERVICE DESIGN DOING.

Marc Stickdorn
Markus Edgar Hormeß
Adam Lawrence
Jakob Schneider

1. Why service design?

Service? Product? Experience!

Many folks make a big fuss about the difference between services and products (or goods), and where exactly the distinction lies. “If my company offers it, it’s our product” says one. “It’s only a product if you can drop it on your foot”, says another. Within service dominant logic¹ you will hear that tangible products are merely a form of services - they have been called “service avatars”. Or the Jobs to be Done approach suggests that customers “hire” a certain product or service to get a specific job done².

What all these discussions about products and services have in common is that customers don’t give a hoot. They pay money (or spend time, or give attention, or exchange something else they value, like data or permission) and they want us to help them, to solve their problems, to realise their goals and to give them a great experience.

The digital revolution has made customers’ demand for valued experiences even more powerful. Where they were previously often forced to take what they could get locally or find in the newspaper, customers now have a huge choice. Indeed, it is often easier to buy from the other side of the planet than from the store across town. They have many channels for information or for purchase, even within one provider, and will switch between them at their convenience. They have more information, with price comparisons, alternative sources, trusted reviews and a wealth of other data just a screen away.

Social media amplifies this change, as customers seize the opportunity to share experiences with potentially millions of others. And they trust the words of peers far more than expensive advertising campaigns. In a Forrester study, 73% of customers trusted the recommendations of friends and family, while only 19% trusted direct communication by organizations³. Business-to-business services may be less sensitive to social media, but word of mouth fulfills the same task here, with some sources describing WOM as the dominant factor in as much as a 91% of purchasing decisions.⁴ So when an organization gets it wrong, the world will be told - and believe what they hear.

¹ Vargo, Stephen L.; Lusch, Robert F. : Evolving to a new service dominant logic for marketing. *Journal of Marketing*. Vol. 68 (January 2004), p. 1.

² Footnote: Christensen, C. M., S. D. Anthony, G. Berstell, and D. Nitterhouse. "Finding the Right Job for Your Product," *MIT Sloan Management Review*, Spring 2007 2--11.

³ Forrester, Consumer ‘Ad-itutes’ Stay Strong”, 2012

⁴ GreenTarget, “Word of Mouth Marketing: The Bad, and the Ugly”, 2012

This makes a difference to the bottom line, as plenty of studies have shown; in 2013, Forbes estimated that poor customer experiences led to 83 billion dollars of lost business in the US alone⁵; companies who excel at customer experience outperform the market⁶, are more likely to be recommended by customers and more likely to see customers return and buy again⁷; and most customers are willing to pay more if they are sure of a better experience⁸. It's not hard to understand - with two coffee shops in your street selling the same coffee at the same price, the one with the better customer experience gets your regular custom.

It seems obvious that customers know what they want, so why do so many organizations get it wrong? They are made up of intelligent people who are doing good jobs, so why do they infuriate, anger, confuse, disappoint or simply fail to impress customers?

They trip up because for years they have been focusing brilliantly on the wrong part of their value proposition. To understand this, we have to understand that an experience is made up of many layers.

In your childhood, you might have played a party game called "Pass the Parcel". Before the party, a mystery gift would be wrapped in gift paper, then wrapped again and again. Layers of paper would be added until it became impossible to guess more than the basic form of what was inside. The excited kids playing the game would unwrap layers and layers, until one lucky child revealed the contents.⁹

The offerings made by organizations - the products and services we want - are wrapped in much the same way (Figure 1-1). The outermost wrapping is the behavior, manner and tone of the staff member (or technological interface) we are dealing with. Under this is a layer of subject and system expertise made of the knowledge and experience of that person. Then there is a layer of processes carried out by front-line staff, for example the sales or refund routines. Next we have the systems and tools run by the organization - logistics systems, billing, Point of Sale systems. And at the core is the offering itself, like a telephone contract or a pair of running shoes.

As a customer, you are like the children playing Pass the Parcel. The only way to get to the offering you want is through all those layers - they all contribute to your experience.

Disinterested staff, misinformed employees, byzantine processes or clunky systems can all make it less satisfying to buy or interact with the offering, making it simply less valuable to you.

But companies are traditionally focused heavily on the content at the core of the parcel, and perhaps the few innermost layers which let them deliver it. They concentrate on technical and operational excellence and they want to "get it right". To them, their job is to optimize the nuts and bolts of their activity - like the hamburger restaurant who invests heavily in new recipe

⁵ Forbes 2013

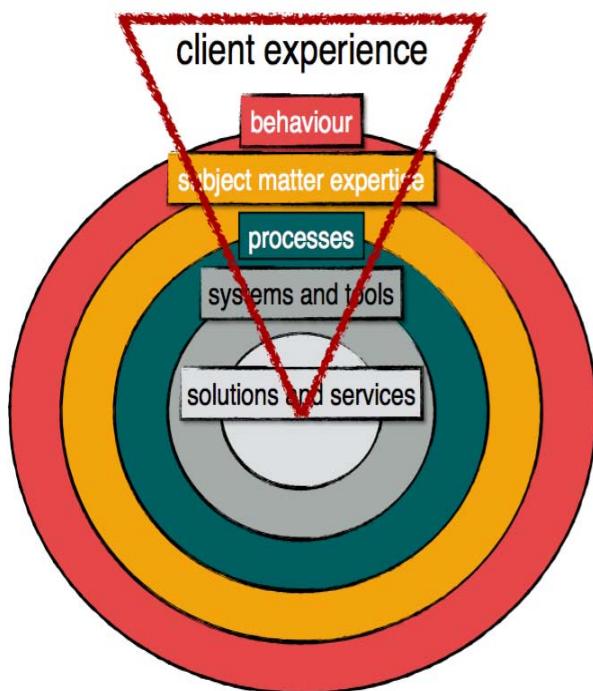
⁶ Watermark Consulting "7 year stock performance of customer experience leaders vs laggards", 2014

⁷ Temkin Group, "The ROI of Customer Experience" March 2012

⁸ RightNow Customer Experience Impact Report, 2011

⁹ 6-level diagram based on "5 Step" model by Swisscom, eg <http://www.stimmt.ch/2011/05/05/customer-experience-wie-vermittle-ich-das-meinen-mitarbeitenden-cen-xchange-mai/>

development. Or they work hard at sales, pushing the message that they have just what the customer needs to solve his problem - like the bank who works hard presenting a consistent image of trustworthiness.



factor with any relation to healing was at position 14, and that was the very experiential issue of pain management.

Of course if someone did not experience a good medical outcome, the situation might be different. When you get sicker, the medical part of the experience becomes imminently important. But until then, it seems that the core competency of the hospital - healing - was taken for granted by the patients.¹¹ It's not hard to imagine this other situations. You don't talk about your hotel room having a door, window or bed until one is missing. You don't rate your bank on their arithmetic skills until they mischarge you. And at that point, it becomes an issue. But otherwise, customers measure us on other factors.

So at the hamburger restaurant, eaters actually care *more* about a warm greeting than an exciting new burger recipe. At the bank, clients worry *more* about the awful log-in process at

But is this core offering what the customer really cares about? In a huge study in the early 2000s, researchers asked thousands of patients to list the factors which led to their hospital stay being satisfying or dissatisfying¹⁰. Now, most of us would expect the "medical outcome" - the successful healing of the complaint - to be one of the most important things to patients. After all, "healing" is the key value proposition of hospitals, it's why people go there. But in the study, all the top ten satisfaction factors were non-medical. Each top factor was experiential, ranging from things like information flow to complaint handling, empathic and polite nursing staff, patient inclusion in decision making, a pleasant hospital environment and - top of the list - having the feeling of being cared for by a well motivated team. The highest

¹⁰ Press Ganey 2003 - full reference needed

¹¹ This phenomenon is well documented and researched since the 1960s, e.g. Herzberg's theory on motivators and hygiene factors: Hygiene factors only contribute to dissatisfaction if they are missing, but do not contribute to satisfaction while motivators do contribute to satisfaction if hygiene factors are fulfilled. Source: Herzberg, F. (January–February 1964): "The Motivation-Hygiene Concept and Problems of Manpower". *Personnel Administrator* (27): 3–7.

the website than about trusting the institution¹². It seems that we are less influenced by the core offering, but more by the layers of experience around it. So how can we make that experience better?

Silos

Since industrialization, through movements like Taylorism¹³ and TQM¹⁴, organizations have focused on operational excellence and efficiency. In a mechanistic paradigm, they have understood their activities as a series of operational process, and looked at optimizing each individual step, usually in terms of costs. Whole organizational units (we often say "silos") have been constructed around work functions which make sense to the company, with a dedicated set of business tools set up to understand, track and manage these functions. It sometimes seems that anything outside the basic offering and the processes necessary to deliver the core value is mostly seen as an overhead, a cost center, or as a "soft factor" - something to be streamlined, cut away, perhaps left to chance or the nice guys in advertising and HR.

So these organizational silos reflect many of the "layers" of experience discussed above, putting them in the hands of separate teams. For example, when I buy my running shoes the process the salesperson guides me through might be designed by the Sales department, and her soft skills and specialist knowledge trained by an education system run by HR. She will use sale and stock systems developed by IT, explain a returns procedure drawn up by Legal and finally sell me a pair of shoes designed by R&D or bought in by Purchasing. The situation becomes even more knotted when my relationship with the company grows longer and more silos come into play.

All these people are good at their jobs, so their work inside their silos becomes more efficient from year to year while helpless customers bounce between them. Of course, there are calls and efforts to work together - but how exactly should this happen? People in the different sub-organizations have their own viewpoints on what is important, their own measures of success, their own KPIs (key performance indicators). There are tools like process diagrams which can indicate the contributions of different departments to the process, but these generally only show the customer if he is necessary for part of the process, or even miss him out completely. They can be used to promote efficient cooperation between silos, but not the understanding of the effect on the consumer. And crucially, there are many parts of the customer journey that are important to the customer, but which do not appear at all on these visualizations. These are the parts of the journey which are not directly influenced by the organization, but which are an

¹² Burger and bank examples both from "The First Key to Creating a Great Customer-Inspired Experience" by Jim Tincher, HeartoftheCustomer.com, posted April 2013 at cxpa.org.

¹³ A production efficiency methodology from the early 20th century. Taylor divided work into the smallest meaningful subdivisions, each of which could be measured and optimised to ensure the perfect flow of actions by the worker.

¹⁴ Total Quality Management, a business methodology famous in the 1980s and 1990s that attempted to continuously improve the quality of products and services using feedback loops and the systematic analysis of work processes.

important part of the customer experience - like waiting, third party reviews, or discussions with friends.

So, put a cross-functional team in a room together, and where should they start? Usually the basic tool of such cooperative attempts is meetings, and the teams are faced with the colossal task of reconciling different worldviews and different languages by basically talking about it. It is no wonder that cross-functional cooperation is extraordinarily difficult, as each delegate honestly argues for his own point of view using his own specialized language.

How can we make it easier for these people to cooperate and create value together, so that each department sees the results as their own and is invested in their success? And how can we help them to orchestrate experiences across their silos, working together to create real satisfaction?

Innovation

Most organizations see innovation as something which is both necessary and desirable. It is often closely linked to generating a USP (unique selling proposition), but the innovation might be in terms of creating unique offerings, in the internal processes which enable those offerings, or even in the business model of the organization. Whichever of these is true, the need for innovation is driven by a changing (business) world, and a general ubiquity of technology and information which makes it easier than ever to copy. If my offering has value and is easy to reproduce, then it will be copied directly or indirectly, legally or illegally by people who have not had my development costs and can therefore offer it cheaper. Even if they offer it at the same price, the result is the same - commoditization. There will be two or more similar offerings on the market, and a price war will loom.

In various models of customer satisfaction¹⁵, it's clear that aspects of an offering which are initially seen as delightful soon become expected. One vivid example is wireless internet in hotels in developed countries in the early 21st century. Initially, travellers were surprised and delighted to be able to use wifi in hotels and were happy to pay for it. Soon, they expected to find it in every hotel, and began to grumble that the price was higher than at home. As we write, with wifi available for free in coffee shops, cabs and budget buses, hotel guests "compare Wi-Fi to hot water, electricity or air"¹⁶ and are often annoyed or angry to see a charge for it on their hotel bill. An *excitement* or delight factor (according to followers of the Kano model (Figure 1-2)) has degraded to a performance factor and then a basic or *threshold* factor.

¹⁵ eg Kano 1984 or Expectation confirmation theory by Oliver (1977, 1980)

¹⁶ NYTimes July 6, 2015, accessed at <http://www.nytimes.com/2015/07/07/business/free-hotel-wi-fi-is-increasingly-on-travelers-must-have-list.html>

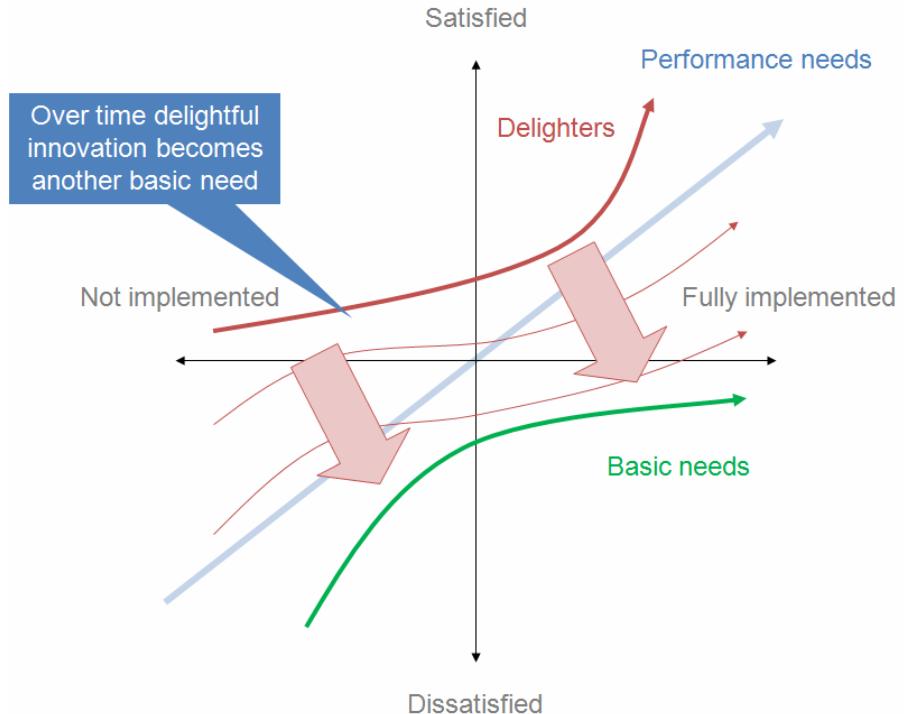


Figure 1-2 Graphic, Kano model - placeholder from Wikicommons

All this means that many organizations prioritize innovation as a key success factor in their work. The innovation might be evolutionary (incremental) or revolutionary (disruptive), and we need techniques for both of these. And as service becomes more and more visibly important for every firm, the focus of innovation turns that way. So today's companies look for ways to understand the needs of their customers in a way which will provide useful insights and spark interesting ideas. And they need a way to work on those ideas in cross-silo teams, diversifying, filtering, testing and evolving them until they are implemented as innovations - to the offering, the operations or even the business model.

What are organizations doing about it?

Many companies today understand the importance of customer experience to their success. And this awareness is growing fast. A study by Gartner Research predicted that 89% of companies expected to compete mostly on the basis of customer experience by 2016 – in comparison to meager 36% in 2010.¹⁷

One of the first things which organizations do when they understand the importance of customer experience is to take measures to track it - or rather, to track customer satisfaction. The most visible tools used are online and offline surveys or the Net Promoter Score (NPS) in particular,

¹⁷ Sorofman, Jake (2014): "Gartner Surveys Confirm Customer Experience Is the New Battlefield", Gartner for Marketing Leaders, online: <http://blogs.gartner.com/jake-sorofman/gartner-surveys-confirm-customer-experience-new-battlefield/>

with thousands of organizations regularly asking “*How likely is it that you would recommend our company/product/service to a friend or colleague?*” This is a valuable metric, but it has the challenge of so many quantitative measurements: when your NPS slumps, it tells you that you *have* a problem, but it does not tell *why* you have one. It tells you how big your problem is, but not how to fix it or how to innovate.

NPS and similar metrics can surely help show problem areas, and especially show that silo thinking is a factor in many poor experiences. But there is an old adage that “weighing the goose will not make it fatter”. Organizations are now looking for new, reliable and scalable ways to move beyond measurement and innovate experiences strategically across silos. Increasingly, they turn to what we call service design.

Why a service design approach?

There are many ways to create or improve the value generated by an organization. People working on this challenge might call what they do service engineering, or marketing, quality, or simply management. A few of them - a growing minority - refer to this work as service design. They share a certain outlook and often a common toolset (see chapter X).

Strictly speaking, service design is a particular approach to working with services (and products within service ecosystems) which adopts the mindset and iterative workflow of the design process, combining an active, iterative approach with a flexible and relatively lightweight set of tools borrowed from marketing, branding, user experience and elsewhere¹⁸.

It is this patchwork background which makes service design powerful. As a design discipline it is focused on solving the right problem, so it starts by investigating the needs of the user or customer. It is inquiring and inquisitive, using a range of mostly qualitative research methods to explore the “how and why” of the opportunity space. Understanding needs, instead of jumping straight to a “solution”, makes true innovation possible¹⁹.

Next, service design uses a prototyping approach to test possible solutions quickly and cheaply while generating new insights and ideas. With this strong emphasis on iterations of research and prototyping, service design projects have a firm foundation in reality. They are built on research and testing, not on opinion or (rapidly outdated) authority. And the iterative approach makes decision-making in service design a low-stakes activity. Instead of worrying about getting

¹⁸ TEXTBOX: Why I chose service design - ““Service design applies design thinking to services and focuses on doing (not just talking)”. Julia Pahl-Schoenbein, senior project leader for business development, Germany

¹⁹ TEXTBOX: Why I chose service design - “I got interested because Design Thinking & Service Design put customers and users at the center of their methodology and framework - they provide a holistic view of the solution and make it easy to identify gaps in the experience”. - Musa Hanhan, executive at a business software company, USA

it right first time, we can evolve a range of options, and rely on the structured process of prototyping and testing to judge and improve our work²⁰.

Many organizations are looking for an effective way of working which makes it easy for people with different backgrounds and responsibilities to work together meaningfully and productively.²¹ They are looking for a “silo breaker”. Because the tools of service design have been filtered through a design mentality, they are visual, fast, lightweight and easy to grasp. They form a common language for collaboration, so cross-functional teams can quickly pick them up and get on with it.²² The tools can look very simplistic at first sight - they make no effort to encompass the entire complexity of a service system (there are already excellent tools for that). Instead, they filter complexity through the lens of various customer experiences²³. This makes the approach very powerful: even complex multichannel services become manageable for the team when they can understand them on both a practical and a human, empathic level.²⁴

Service design is an intensely practical activity, and this makes it inherently holistic. To create valuable experiences, service designers must get to grips with the backstage²⁵ activities and business processes which enable the front stage success, and address the implementation of these processes. They must tackle the end-to-end experience of multiple stakeholders, not just individual moments. And they must find a way to make it pay, considering the business needs of the organization and the appropriate use of technology.

²⁰ TEXTBOX: Why I chose service design: “I love the fast iterative cycle of the process, and that you don't need to get it right the first time. “Sh!tty first drafts” are powerful!” - Soo Ren Chang, HR professional, Malaysia

²¹ TEXTBOX: Why I chose service design: “Service design skills are useful because they can transform employees and managers to be truly user-centered.” Julia Pahl-Schoenbein, senior project leader for business development, Germany

²² TEXTBOX: Why I chose service design: “My challenge was how to collaboratively generate service ideas that work; and how to guide/facilitate that process. Service design meets these challenges.”- Carola Verschoor, creativity and change professional, Netherlands

²³ TEXT BOX: Why I chose service design: “Many service design tools are mind hacks that help us reframe problems in a way humans are built to deal with. We shape clouds of slippery data into human forms and into visual stories which we can understand from any viewpoint - whether technical, specialist or simply empathic. Instead of designing complex systems directly, we try to answer simple questions of “how might we...?” And rather than trying to interpret each other's words, we communicate and advance on multiple channels through building prototypes. All these hacks make it easier for us to concentrate on the content instead of the tools, and open up our work to a wider group of people and their insights. The result is better services.” - Adam, coauthor

²⁴ TEXTBOX; Why Service Design?: “The challenge I was facing was to build a coherent multi-channel service. I needed a way to visualise the stages and parts of the service in order to identify and communicate the issues, as well as trying to improve matters for all concerned. Service design answered all of this through its tool set, specifically service blueprints, user journeys and stakeholder maps, and allowed me to bring others in to understand the overall picture. Service Design also helped set a base for research that was needed and then provided guidance on how to distill that information to a manageable format.” - Stuart Congdon, infrastructure systems executive, UK

²⁵ “Backstage” refers to processes or action which are normally not visible to the customer, such as checking in the store room or emptying the trash. “Frontstage”, then, refers to the parts of the process which a customer can see.

With these characteristics, it is no wonder that many organizations are implementing service design methods under whatever name, and that many more are employing service design agencies. Examples include household names like McDonalds, Coca Cola, Lufthansa and Volkswagen; professional services providers like Accenture and PWC; banks like Capital One or Barclays; energy providers like E.ON or British Gas; and public services like the BBC and Victorian Government.

Summary

Service design is a way of working which can help organizations provide better end-to-end customer experiences across multiple channels. This improved experience often leads to success. Service design's iterative approach uses research to focus on user needs, and prototyping to test and evolve possible solutions before making large investments. It balances the experiential, operational and business needs of an organization in a robust but approachable manner, offering a common language and toolset which can be used across whole organizations.



UX Research

PRACTICAL TECHNIQUES
FOR DESIGNING BETTER PRODUCTS

Brad Nunnally & David Farkas

2

Good Research = Good Questions

I don't pretend we have all the answers. But the questions are certainly worth thinking about. – Arthur C. Clarke

Research has always been a part of product development and design, as showcased by the previous chapter. In today's world, the products being developed no longer are restricted to a single community, population, or geographical location. Modern products span the globe, sometimes in very unexpected ways. A product that starts as a game can, in a year's time change an entirely different business like how teams collaborate and communicate. For products that have to operate at this scale, research is a core component to both short-term success and long-term growth.

For teams to not only conduct meaningful research, but also collect data that will allow a team to quickly iterate their product, they need good questions to ask. If you've ever had to learn something from another person, you know that asking a "good" question is more craft than science. In the following chapter, we will discuss this craft and provide methods you can use to create questions that help you learn specific topics, remove factors such as personal and unconscious bias, and provide a quick exercise you can perform to quickly iterate through potential questions that can be asked about how someone might want to interact with a product.

Why are good questions so hard?

Researchers always struggle when it comes to writing down the questions they need to ask their participants. Sure this gets easier over time and as you gain experience, but the act of writing an interview guide or test plan never gets "easy". At the end of the day we are all human and we are susceptible to our own weakness and limitations.

The deck is stacked against us when you start to consider social, personal, professional, and sometimes logistical factors that can inhibit our ability to have a conversation with someone else. Predicting all these factors before research even starts is no small feat. This in turn makes writing down lines of inquiry that will result in good data that the team can

use seem daunting. But, you have to start somewhere and iterate as you learn what questions work and which fall flat. To help with this, first we need to understand what role questions fulfill when conducting any type of research.

Introduction to the role of questions in research

It's hard to conduct research when you don't know what question needs to be answered. Every research effort starts with you needing to know why something happens, what people do in certain circumstances, and how they perform key tasks. To find answers to these questions, we must find people to talk to and ask them things that get to the heart of the matter. Without this, we would be making wild guesses and shooting in the dark. While often tempting, this degree of freedom leads to failure and your product never seeing the light of day.

How good questions go wrong

We can't tell you how many times we've written a question down and thought "This is it! This will get us some awesome information from people" and have it fall flat during a session. This happens to all researchers and it will happen to you. And that's ok! Bad questions can be mitigated through the planning phase if you know what makes a question go bad. The following are types of questions that can lead any research astray.

Leading Questions

It's easy for you to get caught up in the excitement of research and getting a chance to hear from real people about how they want to use your product or what they think of it. This excitement can trick you into asking questions that give participants a clue, or directly point them, at the type of answer you're looking for. These are called Leading Questions, and they can really hamper not only your research session but also the data you collect. Research participants want to be helpful and they know they've been selected out of a pool of people to provide some kind of value to you and your team. Since they are already primed to help, if you ask a question that implies the type of answer you want from them they are more likely to give you that answer, even if it isn't something that doesn't really apply to them.

Shallow Questions

One of the golden rules of research is never ask yes or no questions. When you're trying to create questions for the first time for an upcoming research effort you'll find that not asking these types of questions is really hard. These types of questions are harmful to your research because it gives participants an easy out. Participants don't have to think too deeply to provide you with a response and in their minds they are giving you some sort of confirmation that may be of use.

Personal Bias

We all have our own personal beliefs about how products work, or how they should work. These personal beliefs can sneak into the questions. The only way to avoid this is to be removed from the research. While strict practice may suggest not conducting the research yourself, we instead recommend developing questions from the point of view of the product, the customer, or even from stakeholders of the product. The less "you" there is in the interview the better the data will be that you will collect.

Unconscious bias

Our brains make tons of decisions for us every day, many of which we aren't even aware of. These decisions can be influenced by social norms, personal history, past experiences, or expectations. These types of bias are also the hardest to catch. The danger of unconscious bias is taking for granted that the world might not be how we expect it to be and actively find ways to question it. You can't take things at face value, you have to dig deeper no matter how uncomfortable that might make you feel. For instance, gender bias exists within the workplace because most people aren't aware that the bias exists in the first place.

Knowing when to break the rules

If you're just getting started building out your research skills, it's important to avoid the aforementioned questions. However, once you get a few studies under your belt and the art of crafting and asking questions becomes more natural you'll find that you can use leading questions and shallow questions in strategic ways. You can even use a participant's personal and unconscious bias to drive to a deeper conversation about people might use a product and that product might impact a person's life.

Leading – These are best used when you suspect the response will be opposite to the hints you provide in your questioning. You can use leading questions to help build trust with a participant and to validate previous comment they might have made that maybe wasn't totally clear.

Example: How much do your friends and families appreciate photo albums when you make one for them?

Shallow – When you start a research session, sometimes participants aren't the most comfortable and they need to get used to talking with you and answering your questions. Shallow questions give participants that opportunity and can help ease someone into the activity so you can get to the good stuff.

Example: How many times do you log into Facebook in a day?

Personal Bias – There is something to be said about being a good devils advocate, someone who can take the opposite view of a conversation to spark additional thought or comments. You can use your personal thoughts and opinions to get to deeper conversation by giving the participant something to disagree with.

Example: Do you think the Cubs actually have a chance at the World Series this year?

Years of practice and failure to master

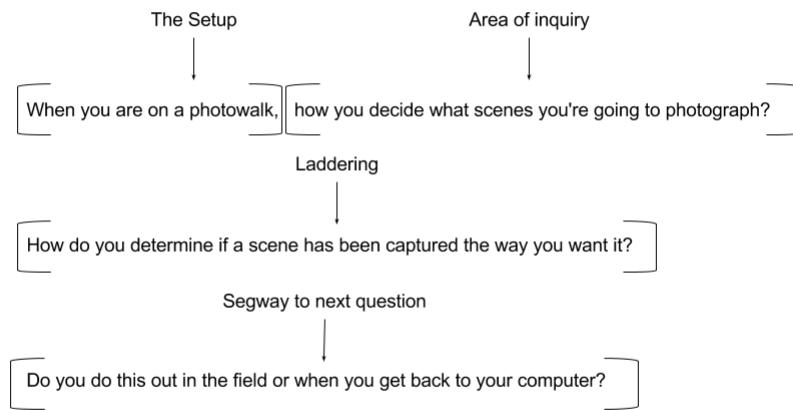
The only way to practice doing research is by finding people to talk to. The first few studies you run won't be the best, and that's ok! You will learn something after each session, even if every question you ask isn't the best version of that question. The goal is to improve your line of questioning and to find ways to hold a meaningful conversation with someone rather than treat research like a verbal questionnaire.

Both authors have had their fair shares of failing during our early years as a researcher. We asked overly leading questions and missed important areas of discussion because we didn't know what we were looking for. But, thanks to mentors providing their feedback

and guidance we eventually overcame these failings. Still today we make mistakes, and that's going to happen, but as long as you have a consistent feedback loop in place you too will continue to improve and eventually master the art of research.

The basic structure of a question

Now that you know what kinds of questions not to ask, let's dive into how to write questions that do work and will get you the information you want. To start off, we are going to cover the overall anatomy of a question and different forms questions can take to drive conversations.



The Set Up

Every question starts off with a purpose. This takes the form of what (description), why (explanation), how (process), when (situation), and where (context). It gives the participant an idea of the type and, more importantly, the length of response you expect out of them.

Area of inquiry

This is going to be the subject of what you want to learn about. Is it about your product or something about how the product impacts or influences someone life?

Laddering

Some responses to your questions will have an automatic “Why?” behind them. Asking for a participant to go into more detail or to explain the rationale behind their response is known as laddering, and it’s an aspect of a question that helps you get to deeper information and potentially impactful stories.

Segway to next question

The best research sessions are really just a focused conversation between yourself and a participant. The best way to make an interview or study session feel more comfortable and conversational is to string questions together so the whole session has a beginning, middle, and end. While it is helpful to think how each question could set up the following question, it is important to keep the discussion fluid, something we will address more in Chapters 8 and 9.

Writing your questions

It's time to put the pen to the paper and start generating the list of queries that'll guide your investigations. To begin, we're going to reach out to our friend Colin MacArthur on how he creates questions to learn about broad and ambiguous topics.

Voice from the Streets



Colin MacArthur
UX Designer and Researcher

IN A FEW WORDS, DESCRIBE YOUR JOB

I try to figure out how the federal government can better serve its people. Often that starts by conducting interviews with people who do (and don't) use government services.

HOW DO YOU BALANCE SPECIFICITY AND AMBIGUITY IN RESEARCH?

I spend many of my days planning and conducting interviews with people who use government systems, data and services.

Figuring out what we want to learn is the easiest part of my day. The hard part is translating our big research questions into good interview questions. We're often trying to answer abstract questions (like "What's hard about interacting with the government"), but abstract interview questions aren't fruitful. If I ask "What was hard about your last interaction with the federal government?" I'll get some confused states, some answers about state governments and a lot of unelaborated "It was OK."

When we want get at abstract questions, we give interviewees "handles" that make them more concrete. A common tactic is asking people to think about a recent, significant life change. As they describe what happened, interviews ask follow up questions that focus on what we're interested in (interactions with the government). Another approach is giving people specific scenarios and asking them to respond. For example, instead of asking people how they feel about the government collecting health data, we might provide a couple scenarios for discussion.

The challenge is making handles useful, but not leading. If we started questions with very specific questions about particular life events, we could narrow conversations and miss unexpected topics. We try to balance making questions open (and non-leading) with making them easy to answer. That's a hard balance to find, but the best approach is iterative. Repeatedly asking questions to friends and then asking them how hard they were to answer helps me. At the end of the day, I've succeeded when our questions both surface interesting questions and don't put an enormous burden on the interviewee.

Relate back to research goals

Every question that finds its way into your interview guide should tie back to why you're doing research in the first place. Remember, every study seeks to learn more about a few key topics or events that relate to your product. If a question won't, or doesn't seem to, provide information that helps you understand these goals it's vital that you remove it from your line of questioning.

Example– Learn about how people determine which photos to share with family and friends.

Bad Question – How to do you ensure that you get good composition when you're out taking photos?

Revised Question – When you're out taking photos, how do you know a particular shot is worth sharing with people?

Opens up additional areas of discussion

There are a lot of assumptions made when planning out the questions and discussion guide order. Some questions are designed to uncover rabbit holes, lines of conversation that diverge from the current topic. These are moments where you'll go offscript and improvise the discussion. Rabbit holes are good to explore as long as you're getting good information from them

Example – Learn why photography matters to the participant.

Unhelpful Rabbit Hole – My mobile phone just made it so easy to take photos, so I just started taking snap shots throughout my day. – Not much here aside from ease of access and a low barrier of entry to taking photos.

Helpful Rabbit Hole – When I was a kid, my neighbor was a photographer and he would let me help out in his dark room to develop his shots. – Lots of potential stories that include mentorship and how the participant developed a love for photography.

Progresses the overall conversation

We've talked about the importance of research sessions feeling more like conversations than having someone respond to a verbal questionnaire. To ensure this happens, your questions should build upon each other and help guide the participant through a series of topics that comes at a natural pacing. Stark changes in conversation can be off putting and be harmful to the information you are able to collect.

Question 1 – What kind of moments do you try to capture when you're out taking photos?

Question 2 – Which kind of moments do you treasure, or hold dear?

Question 3 – When do you decide to print a photo for display?

Question 4 - How often do you change the photos you display?

How to use different types of questions

Recall the basic set up of a question – they typically take the form of what (description), why (explanation), how (process), when (situation), and where (context). Each of these serves a different function and you should have a balanced mix planned across the interview guide.

Process

Process oriented questions are great openers to research sessions or when you're switching topics. It gives the participant a wide-open area to talk about something they have done and how they did it. The benefit to you is that you can produce an impromptu checklist of things you want to learn more about.

Example – How do you design a photo album for a friend or family member?

Explanation

People say the most interesting things and it's rare for you to know why they said them. By requesting the participant to explain their previous comment using the ladering method described earlier, you get a deeper view into their world. This is where you can find really valuable information. This information could be unexpected and surprising, or it could give you insight into exactly why people do certain things with your product.

Example – Why do you feel that photo albums are still a treasured keepsake in today's world where more and more are digital?

Description

We all know everyone has her own unique way of looking at the world. Research is one of those activities that allow you to collect these points of views and add them to your own so you can look at product features and roadmaps from a whole new perspective.

Example – What makes a photo worthy to go into a photo album?

Time based

The moments a participant might use your product can have a lot of influencers. During an interview, you can ask the participant to explain what kind of triggers exist for them that gets them to pick up your product. You can also get insight into how long people tend to spend performing certain actions and how much tolerance they have when something goes wrong.

Example – When do you think photo albums are most appreciated?

Frustrations/Hurdles

The motto of a good researcher is “there is no such thing as user error.” One thing you’ll learn as you go out and study how people interact with products is many will put the blame onto themselves. These are moments of exploration because you can get to the source of why errors are made and what potentially were the cause of frustration that people experience when things don’t workout for them.

Example – What do you do when you don’t have enough photos for an album that you’re trying to create?

Ideals/Dreams

Some say that everyone is a designer these days, but not everyone can design. However, the solutions and ideas that participants share with you can give you insight into the hidden problems that you didn’t know existed. Problems are hard to describe, and harder to identify. Half-baked solutions are the non-designers way of expressing the problems they experience though, and you can collect pseudo-solutions to use as inspiration and guidance for your own product.

Example – If you could, how would you incorporate videos and other forms of media in the photo albums you create for your friends and family?

How to practice asking questions

You don’t want your first time saying research questions outloud to be in a live research session. This is a common mistake made when starting out, but luckily it’s easily avoided. You can quickly practice and iterate your questions by performing a few dry runs with people around the office.

Co-workers & Dry-runs

It’s always a good idea to validate your interview guide with your product team. From the product owner all the way down to the engineering team. These are the folks that are putting their time and energy into building a product and the feedback you get from them will help you refine and potentially shift your lines of questioning. It’s also important to reach out to co-workers that may not be directly involved with your product by conducting a full dry run of an interview with them. Dry runs give you the opportunity to

get used to asking your questions, but they are also situations where you can collect constructive feedback that won't negatively impact the data you collect during a session.

Exercising Curiosity

Before we move on, we want to provide you with an exercise we use when creating our own questions. This is a quick activity that will allow you to get a ton of questions out of your head and allow you to spend more time on the flow of the interview and areas you want to explore.

Step 1 – Grab some sticky notes!

Sit down somewhere quiet with a wall that supports sticky notes (white boards or any other flat non-glossy surface) and just start writing down things you'd like to ask about. These could be general topics or specific questions, the important part is you want to get as much out of your head as possible without regard of research goals, project needs, product strategy, or personal curiosity. Timebox this activity to 5 – 10 mintues, or until you've stared at a blank sticky note and no new questions come to mind.

Step 2 – Challenge each question

Get all your sticky notes up on the wall so you can see them in one spot. For each sticky notes, ask yourself why you need to ask that question, how does it tie back to your research goals, what's influencing you to inquire about it. Also ask what else could you explore that you haven't considered. Grab new sticky notes and write down anything that comes to mind and add it to the wall. If you determine that a sticky note doesn't tie back to the research goals or the inquiry, ask yourself how it could be reframed so it does benefit your research efforts. Don't be afraid to take post-its down entirely.

Step 3 – Inventory time

Collect all your follow up sticky notes and start to store these in some inventory, be it a document, spreadsheet, or mindmapping tool. These follow up stickies are what you're going to use to craft your final list of questions and to guide the order which you'll ask them. While there is no one right tool, the authors often use include Microsoft Excel, Boardthing, and Trello.

Step 4 – Practice!

We've already talked about how you can practice your research questions, now's the time to grab that team member or the person down the hall and see how the questions feel and iterate as needed.

Closing and Words of Caution

Crafting the questions you need to ask is challenging, and it can dissuade many budding researchers. Don't let how hard it is get you down, it's a natural part of the process when it comes to learning a new skill. This is especially true for research. Every researcher you've might of heard of from any field went through the same struggles.

In terms of design, what really matters is that you care enough about your product that you get out of your own way and reach out to people for help. If there is one thing we've learned by doing countless research sessions over the years is people who either use, or might want to use your product honestly care about its success. They will go on and on about what they love and hate about your product, and this is the information that you can get nowhere else.

Now that you know how to structure a question to get the best date, it is important to recognize that there are many different ways questions can be used in research, and many different types of research. Over the course of the next two chapters, we will explore two main buckets of research: Qualitative and Quantitative research.



Prototyping for Designers

DEVELOPING THE BEST DIGITAL & PHYSICAL PRODUCTS

Kathryn McElroy

Prototyping for Designers

Chapter One: What is a Prototype?

Everything is a prototype.

Each thing you make or activity you do can be improved, and nothing is ever completely finished. In this chapter, I'll share current views on what constitutes a prototype, how user-centered design encourages prototyping, and how to cultivate a culture of prototyping in your workplace.

The Oxford definition of a prototype is: "A first, typical or preliminary model of something, especially a machine, from which other forms are developed or copied."¹ The word originates from the Greek *prōtotupos* meaning "first example." By this definition, anything that takes an idea out of your head and makes it visible to others may be considered a prototype. The important element that this definition is missing is the intention to test and improve the prototype over time. So our definition moving forward is: a manifestation of an idea into a format that communicates the idea to others or is tested with users, with the intention to improve that idea over time.

This broad definition allows you to think about how you can prototype any kind of idea in your life. You might sketch a new idea for a floor plan layout before you rearrange furniture in your house. You can write out a recipe to test, and update ingredients depending on how the results taste. You might also write out your goals and dreams to communicate to others, and to remind yourself, as you work towards them and update them as you go. Each of these examples is the initial model of an idea, in a format that can be tested and improved.

What is considered a prototype is a debated topic. There are two main camps: a prototype is anything that is testable and improvable or a prototype is specifically an interactive version of an idea. Both of these arguments are worthwhile. However, if you choose to see everything as a prototype, and use it as an opportunity to test your assumptions through any means possible, your product will benefit greatly from additional feedback and user input. If you prefer the more specific definition of prototyping, this book will still be useful. However, I ask you to keep an open mind to what prototyping *might* be, and how you might incorporate this skill into all areas of your work and life.

Prototyping for products

In product design, prototyping is essential to developing the best result for your customer, which later turns into more sales and happy, satisfied users. There are many names that prototypes have in our industry including proof of concept, minimum viable product (MVP), functional model, and manufacturing model. Although they have different names, the idea is the same: make an improvable version of your product, test it with the end user, and improve it.

There are also many stages of business and product development that benefit from prototyping, such as strategy, use cases, personas, and user journeys. Each of these stages are improved by creating a rough idea of what it should be, testing it and getting feedback, and updating it before settling on a final version.

This framework and process has been proven countless times by large, established businesses, designers, and successful startups. One historic example are the prolific prototypes that Charles and Ray Eames created for each of their designs. They would test many ways of using different materials, fitting to the human form, manufacturing, and finishing. They believed that anyone can create a dream chair in their head, but only by doing the hard work of manifesting that idea into prototypes and then products could they actually fulfill that dream.

User-centered design

As we move through this book, I'll be talking a lot about your users. User-centered design "is the process of designing a tool from the perspective of how it will be understood and used by a human user... rather than requiring users to adapt their attitudes and behaviors in order to learn and use a system"². The best way to create a valuable product is to have an initial understanding of who your user is, and to engage that potential user throughout your process to interact with your idea and prototypes to give feedback.

What specific user or customer will buy your product? If you answered "everyone" or "me" then your product is not serving anyone specifically, which is a problem. When you leave this question broadly answered, or not answered at all, you will quickly see that users can tell that your product is not designed for them. Even if you are a user of your potential product, you're not the only type of person who will interact with it, and other users don't have your same mental model, or thought process. It's important to get outside points of view on a project, especially when you've been working on it a long time and don't realize your own biases anymore.

Since you're not your only user, a lot of your design decisions will actually be assumptions. An assumption is "a belief or feeling that something is true or that something will happen, although there is no proof."³ User testing prototypes provides you the proof that either supports or invalidates your assumptions. When you clear up assumptions, you can have more confidence that your user will find their way, complete their goals, and be happy with your product. By designing for a specific user, and specific user pain point or problem, you are guaranteed to find a spot in the market, and an eager customer.

Developing a culture of prototyping

Prototyping is not just a checkbox that you complete once on the way to shipping a product to market. To get the most out of it, you must incorporate prototyping into every part of your process, and constantly be looking for feedback. Everything can be prototyped, and everything is a prototype. There can always be a better, improved version of what you are creating, and it takes time and practice to develop that urge to always be prototyping.

It's important not just to prototype, but to create a culture of constant feedback and user testing in your company or startup. Each person should seek feedback from their peers to improve the work they are doing. Every meeting can be improved by requiring a prototype as a point of discussion, to keep everyone on track and make it easier to communicate about the work. If this culture doesn't exist in your company, start displaying these behaviors and encouraging your peers to do the same. When your co-workers begin seeing how much your work improves with constant user testing and prototyping, they'll reach out to you to help them improve their work too. That way you can make prototyping a common term and an expected part of your team's process.

Summary

Prototypes should be the cheapest way to test a specific assumption, and that means they can be nearly anything that takes an idea from your head and makes it visible to others. As long as you have the intent to improve your prototype, you can really not go wrong with what you build. To help you stay focused, it's helpful to take a user-centered design approach. By keeping your ideal user in mind, you can shape your product and test it with feedback from real people. And finally, by incorporating prototypes into all parts of your design process, you can build a culture of prototyping at your workplace and be constantly getting feedback on your work.

1 - "Definition of Prototype in English.." Prototype: Definition of Prototype in Oxford Dictionary (American English) (US). Accessed March 09, 2016.

http://www.oxforddictionaries.com/us/definition/american_english/prototype.

2 - "Introduction to User-Centered Design." Usability First -. Accessed March 09, 2016.

<http://www.usabilityfirst.com/about-usability/introduction-to-user-centered-design/>.

3 - <http://www.oxfordlearnersdictionaries.com/us/definition/english/assumption>