Information Dashboard Design: The Effective Visual Communication of Data, Stephen Few

Designing for the Digital Age: How to Create Human-Centered Products and Services, Kim Goodwin, Alan Cooper

The Inmates are Running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity, Alan Cooper
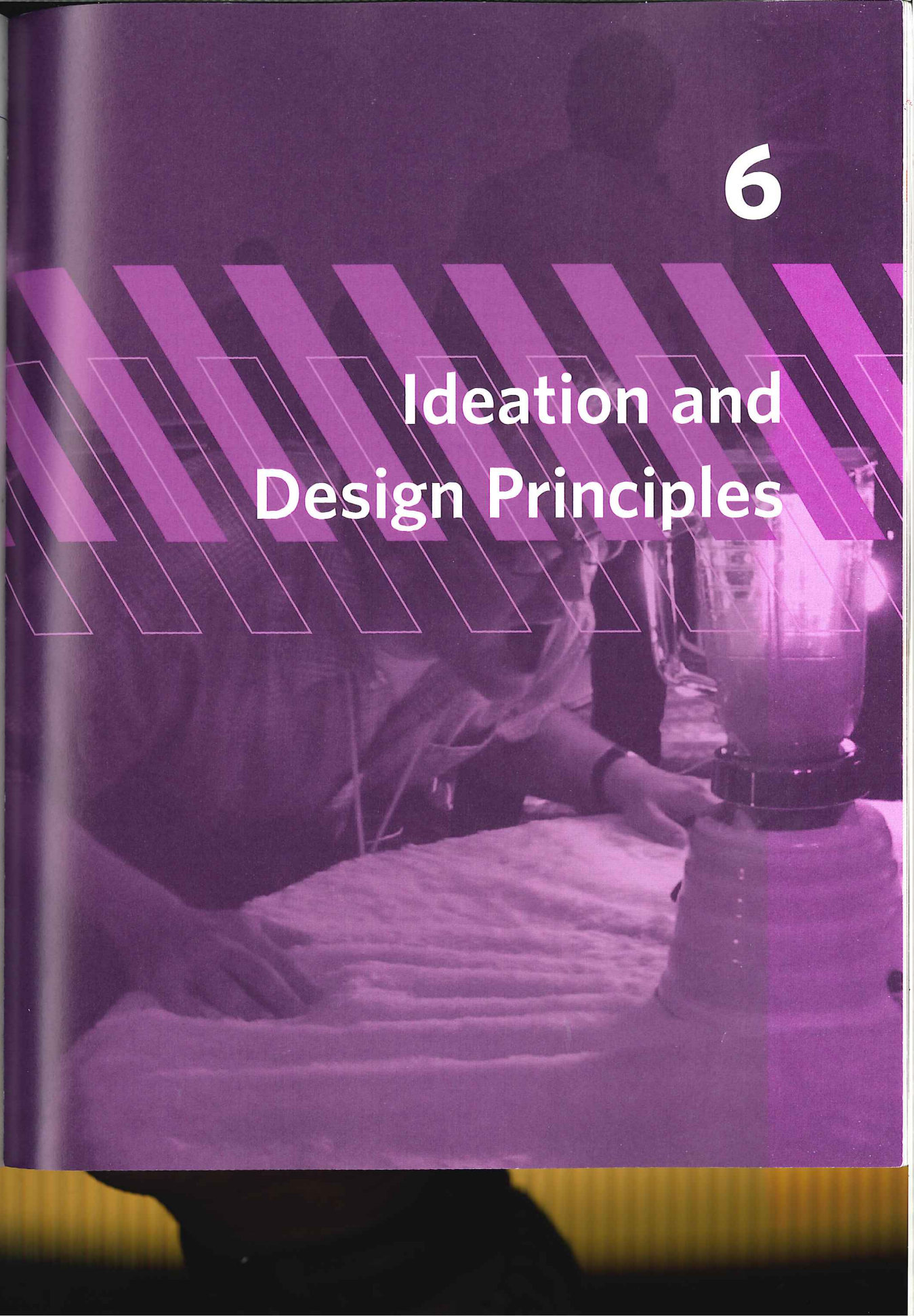
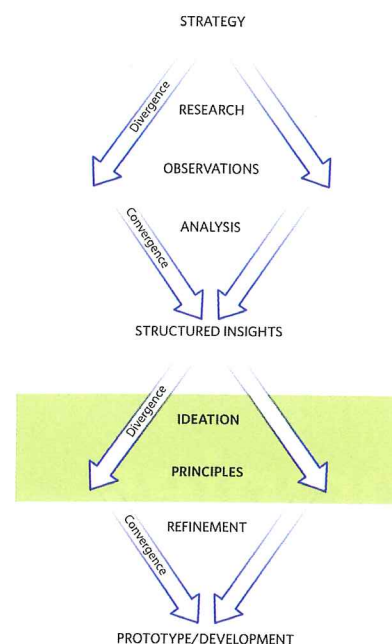*About Face 3: The Essentials of Interaction Design*, Alan Cooper, Robert Reimann, David Cronin

The User Is Always Right: A Practical Guide to Creating and Using Personas for the Web, Steve Mulder and Ziv Yaar

The Persona Lifecycle: Keeping People in Mind Throughout Product Design, John Pruitt and Tamara Adlin

6

Ideation and Design Principles

STRATEGY

Divergence

RESEARCH

OBSERVATIONS

Convergence

ANALYSIS

STRUCTURED INSIGHTS

Divergence

IDEATION

PRINCIPLES

REFINEMENT

Convergence

PROTOTYPE/DEVELOPMENT

You know what needs to be designed. You've listened to your business stakeholders and to your users. You've made models of the strategy and of the design research. And now you are staring at a blank piece of paper or screen. You have to, well, design *something*. This is where ideation has to happen.

And once you've come up with tons of ideas, how do you choose which ones are worth pursuing? You use a set of design principles that will not only help select the best ideas, but guide the design through refinement, prototyping, development, and beyond.

But first, let's diverge and come up with concepts.

Creating Concepts

The purpose of brainstorming is not to find the one perfect design for your project. That will come later. Instead, the reason to ideate is to generate many concepts as rapidly as possible. At this point in the design process, quantity — not quality — is what matters the most. You want a wide variety of concepts that approach the project from a wide variety of angles. Even ideas that seem outlandish and completely unfeasible are welcome, because from them, something feasible might evolve (see **Figure 6.1**).

As an ideal, each brainstorming session, even a short one of an hour, should generate dozens of ideas. For a new product, you should brainstorm over several days to generate hundreds of ideas, concepts, and fragments of ideas. It doesn't matter if they are variations on an

COURTESY TOM MAIORANA AND KICKER STUDIO

Figure 6.1

In ideation, you should strive for as many concepts as possible in as short a period as possible.

idea, or even if you or others have thought of them before. Just put them down and move on to the next idea.

What you want to do is get every idea you can possibly come up with out there, on paper *as a sketch* not in words (although sometimes giving your concept a name is helpful later, as are words to explain a part of the sketch) so that they can be considered *later*. Be as specific as you can be. No "Fix the thing with a drop down" type notes. Draw the solution you've come up with. The quality of the drawing doesn't matter.

Brainstorming requires some tools. First, because of the limitations of today's available technology, brainstorming should never be done digitally; it should be done with paper, pencils, pens, markers, and possibly whiteboards and sticky notes. You need to be able to jot down an idea quickly, set it aside, and move on to the next idea. Fumbling with technology just gets in the way. You can capture your ideas with a digital camera later if necessary. For now, analog means pencil and paper work best.

When brainstorming, designers should have all the research and models close at hand and in view (taped to walls perhaps) for reference and inspiration. Also, brainstorming doesn't have to be limited to the designers on the team. Inviting stakeholders, developers, engineers, and even outsiders can sometimes lead to productive ideas you might not have thought of. Just be sure they understand the "rules" of brainstorming:

- **There are no bad ideas.** There is no judgment about anyone else's ideas.

- **Stay focused.** Put stray thoughts or unrelated ideas into a "parking lot": a physical place in the room where those sorts of wayward ideas can be captured, but not discussed.

- **Don't spend a lot of time on any one idea.** In the initial brainstorming sessions especially, the goal is to generate as many ideas as possible. Save going into depth on any one idea for later. For now, more is, indeed, more.

- **Use the whole room.** Post things up on walls. Simply seeing all the ideas may generate connections between them or generate new ideas.

- **No multitasking.** You can't do brainstorming well when you are focused on answering email, IMing, texting, or working on other things. It's a concentrated activity, so all distractions should be removed as much as possible.
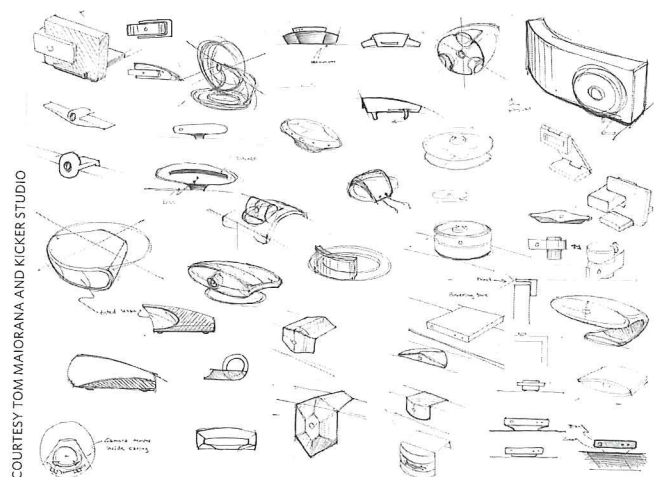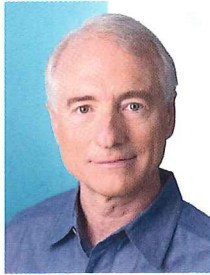
Larry Tesler on How to be a Good Interaction Designer

Larry Tesler's resume reads like the history of interaction design. He's worked at Xerox PARC, Apple, Amazon, Yahoo!, and now 23andMe. While at Xerox PARC, he helped develop some of the language of interaction design, including pop-up menus and cut-and-paste editing. His law of the Conservation of Complexity (discussed in Chapter 7) is known to programmers and designers alike.

You've worked at some of the seminal places for interaction design: Xerox PARC, Apple, and Amazon. What do they all have in common?

All of them place a high value on both advanced technology and customer delight.

What personal qualities do you think make a good interaction designer?

Enough confidence to believe you can solve any design problem and enough humility to understand that most of your initial ideas are probably bad. Enough humility to listen to ideas from other people that may be better than your own and enough confidence to understand that going with other people's ideas does not diminish your value as a designer.

True concern for the comfort and happiness of other people, including your users and your teammates. If you're not teammate friendly, your products won't be user friendly. That does not mean you should cave in under pressure on an important issue when you have data that supports your opinion. But it does mean you should judge success by the success of the product and the team, not just by the success of your own narrow contribution.

There are a lot of other desirable personal qualities for a designer, such as attention to detail, objectivity, appreciation of humor, appreciation of esthetics, and appreciation of data about users and usage.

What are the most common mistakes that beginning interaction designers make?

What mistakes beginners make varies a lot, partly based on their background and training.

Larry Tesler on How to be a Good Interaction Designer *(continued)*

Some educators, particularly in computer science departments, tell their students to design for themselves as the users. If taken literally, that advice leads to interfaces that only computer science students can use.

I do believe that if you learn to place yourself in the shoes of the user, you can design "for yourself" and really be designing for the user. I call this approach "Method Design" because the mindset is similar to that of Stanislavsky's "method acting." You're really not designing for yourself at all. You're designing for "your character." Of course, to be a successful Method Designer, you need to know your character. That's one reason designers should observe ethnographic studies and usability studies.

Beginners often succumb to pressure from management to "save money" by skipping usability tests despite serious open questions. At the other extreme, beginners sometimes run many more tests than necessary, bring in too many subjects, spend too much time preparing formal reports, or fail to pick their battles.

Usability testing should always be done before a designer finalizes unproven or controversial interface elements. But testing should be conducted in the cheapest possible way. Of course, it is sometimes necessary to demonstrate the value of research to skeptics. In that case, it is worth taking a couple of hours to edit a highlight video showing the severity of the users' confusion.

Two other mistakes made more by beginners than experienced designers are to ignore standards and to follow standards unthinkingly. Consistency is usually good, so you need a really good reason to diverge from standards. But you can not be sure you have a really good reason unless you actually see your users do much better with the custom design element than with the standard.

Choice of words is important. Shorter is usually better. But if you have to explain what "x" means to many of your users—or worse, to your teammates—then you should probably replace "x" by whatever you said to explain it.

Larry Tesler on How to be a Good Interaction Designer *(continued)*

To my mind, what most separates an expert from a beginning designer is the ability to draw from a larger space of potential solutions. Given a particular problem, the beginner and the expert may at first think of the same solution, say, a multi-page flow with numerous forms. But the beginner is likely to fixate on the solution even if it is inordinately complicated. The senior designer will consider radical alternatives, say, a way for the user to see the data as it would look in its final state and edit it in place.

The senior designer won't stop simplifying until the design is simple enough. It need not take months to go through this simplification process. It can take just days, or hours, even seconds. Great design often takes time, but it's wasteful to spend time on approaches that are not simple enough to have a chance of being final.

Are there any unbreakable "laws" in interaction design?

Just one. Design for the users.

Getting Started

Ideation requires being able to make fast mental leaps and connections, so start with a warm-up exercise to get everyone's brains working. For instance, first dwell on the subject at hand in the broadest possible sense. For example, on a project to build an installation for a museum, spend 10 minutes doing a word association game on what art is or what a museum is. Or do drawings based on famous artists. Or have all the people in the room talk about their best (or worst) experience at a museum. What the exercise is doesn't much matter: the point of the warm-up is to get brains, hands, and mouths engaged before starting to generate ideas (see **Figure 6.2**).

Set aside a fixed amount of time for brainstorming—usually not more than two hours at any given time period. Allow for breaks between sessions. It's tiring work and without breaks, it quickly becomes frustrating and tedious. It's also ideal to spread brainstorming over several days. The unconscious will work on the problem while you are sleeping, in the shower, walking, etc. and possibly provide you with concepts and ideas slowly over time.

COURTESY MARCO ANTONIO TORRES

At this point in the design process, no idea is a bad one. Set aside most of what you know about the technical, user, or business constraints (you'll add them back in later). Right now, you want to ask yourself the question Alan Cooper challenges interaction designers to ask: How would it work if it was magic?[1] Meaning, if all the constraints were gone and the user could just push a button, what would happen? How would the system accomplish the task? What would the feedback (see Chapter 7) be like?

Structured Brainstorming

Alan Cooper's "magic" framing is just an example of structured brainstorming. If you've ever sat down to do anything creative, you know that one of the hardest things is to begin. Without any structure, it is easy to stall after one or two ideas or simply stare at a blank page.

Some common structures to use in brainstorming sessions are:

- ▶ **Pain Points.** Hopefully one of the things learned in design research was what part of the process or activity is problematic or difficult. These moments make excellent focus points to brainstorm around.

- ▶ **Opportunities.** Likewise, if there are known places for innovation, those can be points to begin.

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1 Stated in his book *The Inmates are Running the Asylum*

▶ **Process Moments.** If there are known steps in the activity, you can ideate around each of them. Of course, you will eventually have to put the pieces together, but each piece can suggest a greater whole, a framework (see Chapter 7).

▶ **Personas.** Personas generated by design research can also serve as structure by focusing solely on addressing the direct expectations, motivations, and behaviors of one particular persona. Do this for each persona in turn.

▶ **Metaphors.** Human brains work in metaphors.[2] We can harness this natural ability to compare unlike objects to aid brainstorming. Sometimes by using metaphor, you can discover a framework that can wrap around the whole project. What is this product like? What is the product not like? For example, what if you thought of a mobile device as a toy? As a musical instrument? As a cooking utensil? Sometimes, the oddest metaphors will uncover a previously unthought-of direction for the design.

Spend a fixed amount of time (30-60 minutes) on each pain point, opportunity, process moment, etc., then take a break. Then move on to the next session (see **Figure 6.3**).

There are many other known brainstorming techniques[3] that can help structure your ideation sessions.

Here are samples that are especially good for interaction designers:

▶ **Brainwriting.** Each person writes down or sketches the beginning of an idea silently on a piece of paper. This could be as simple as a single word or a shape. After three minutes, the person passes the paper to his neighbor, who continues the idea. This repeats around the circle until it gets all the way back around to its originator.

▶ **Break the Rules.** Rather than ignore the constraints you (hopefully by now) understand, you list them and one-by-one figure out how to break them.

▶ **Force Fit.** Distill the problem down to two words that are in opposition, then put those words together into a phrase. For example, "intense peace." Ruminate on what exists in the world that embodies that phrase, then try to apply it to the project for inspiration. Nature and art often work well for this.

▶ **Poetry.** Reduce the problem down to a haiku or short poem. Such a small form makes you figure out what is most important.

▶ **Questioning.** Start with a very general concept and keep asking two questions: how and why. For example, "We are going to build a social networking site." Why? "So record collectors can exchange albums." How? "By uploading their rare albums." How? Etc.

▶ **Laddering.** Laddering means either moving "up" to a level of abstraction ("What is this problem an example of?") or moving "down" to something concrete ("What is an example of this problem?"). Laddering is especially good for getting unstuck.

▶ **Swiping.** Swiping means stealing the best ideas from another field or domain. It starts by abstracting your problem ("This is about finding something small") and asking what other products or fields have ways of doing the abstraction.

▶ **Bizarro World.** Pretend you wanted to make the opposite product or the opposite outcome. Invert everything: what is good is bad, what is desirable isn't, etc.

It's not a bad idea to incentivize idea generation as well. Small rewards or prizes for the most ideas generated, or a group reward once you reach 100 concepts, can do wonders for enthusiasm. To be more egalitarian, give everyone a raffle ticket for each concept generated, then pick a prizewinner at the end of a session.

Figure 6.3
...ation around ...ngle screen, ...wing various ...uts. Tracing paper ...s laid over the ...vious iteration and ...n sketched on.

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2 See the great book *Metaphors We Live By,* by George Lakoff and Mark Johnson
3 For an amazingly complete list, see All Known Idea Generation Methods, compiled by Jack Martin Leith at http://www.jackmartinleith.com/idea-generation-methods/

Organizing Concepts

Once you've generated your concepts, it's a good idea to spend some time organizing them. Just like with data generated via design research, it's good to cluster, name, and sort all the ideas you've created so that it is easy to examine and discuss them (see **Figure 6.4**).

Figure 6.4

Concepts clustered activity around managing diabetes.
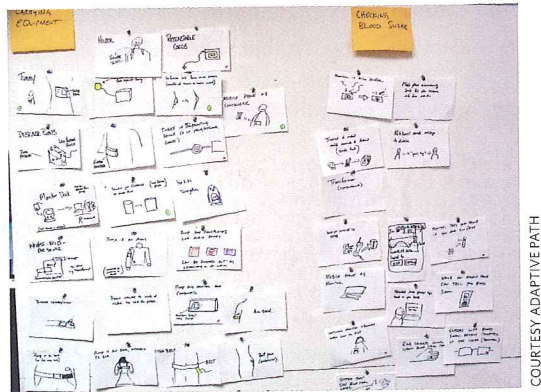
Give each idea a number, or better yet, a descriptive name, especially for major concepts. Collapse similar concepts together, as there will likely be duplicate ideas.

As a way of comparing concepts, it might make sense to sort them by various criteria. You can put them on a 2×2 matrix (see Chapter 5) to show where each falls on a continuum. You can put them into a spreadsheet, labeled by attribute ("safe," "powerful," etc.).

The purpose of organizing concepts is so that when you have your design principles, it is easy to use them as a lens on the ideas you've already generated.

Creating Design Principles

Once you have your concepts, how do you determine which ones are worth pursuing? That's where design principles come in.

Design principles are a set of phrases designed to help guide design decisions throughout the remainder of the design process—and even beyond, after the product launches. They can be thought of almost as design requirements, except they should not be a specific prescription for solving a particular problem; rather, they are general statements that apply across the project. Think of them as a design strategy, the same way there is a business strategy.

Let's say, for example, you are designing a new recipe display for kitchens and you've noticed people's hands can get covered in flour or other food-stuffs while cooking—too soiled to be able to operate most controls easily. Thus, one of your design principles might be Operate with Messy Hands. It's almost a requirement, but it applies across a number of features and suggests the concepts that might work well for the product, such as touch-screens, voice commands, or maybe a gestural interface. Using this principle would also stop you from designing small buttons or using materials that couldn't be cleaned easily. And it might also cause you to discard many of the concepts you came up with during ideation.

Design principles are a combination of three things:

- What is known about the users, the context of use, and the design strategy.
- The best ideas/themes that emerged from ideation sessions.
- What the designer thinks is necessary for a successful project, based on experience or subject matter expertise.

Using our recipe display example, other design principles might be Help From Across the Room, Allow for Improvisation, and Act Like a Sous Chef.

The best design principles are:

- **Pithy.** A short phrase is best. If it needs to be described, you can do that, but make sure it has a short phrase as a lead-in because you want it to be…
- **Memorable.** The best design principles can be remembered easily by everyone on the team. Funny, witty, and provocative statements and plays on words work best.
- **Cross-feature.** Design principles should be applicable across the product. If you can't apply it to more than one feature, it's probably a requirement, not a principle.
- **Specific.** Easy to Use is not a design principle. It is too general, and doesn't give any guidance on making a decision between options

while refining (see Chapter 7). Of course it should be easy to use (and intuitive, and delightful, and innovative, and other clichés) but what about this particular product is unique?

▶ **A differentiator.** After you've made your design principles, see if they as a whole could be applied to a competitor (if there is one). If they can, then they probably aren't specific enough (or your product isn't differentiated enough).

▶ **Non-conflicting.** You want the product to be harmonious, and you don't want to pit one principle against another, so be careful not to create principles that might be in conflict once applied, such as Never Ask Questions vs. Give The User Total Control.

Case Study: TiVo

The Company

TiVo, the preeminent digital video recorder (DVR) manufacturer.

The Problem

In the late 1990s, no one had a DVR—because they didn't exist yet. TiVo had the problem of how to design and launch a technology that was incredibly disruptive to how people were used to watching TV, but make it so that it was understandable, accessible, and fit into people's lives and, especially, living rooms.

The Process

The TiVo team created a set of principles (they called them "tenents"), some of which are still in use a decade and several versions of the device later. The mantras were:

▶ It's entertainment, stupid.

▶ It's TV, stupid.

▶ It's video, dammit.

▶ Everything is smooth and gentle.

▶ No modality or deep hierarchy.

▶ Respect the viewer's privacy.

▶ It's a robust appliance, like a TV.

Case Study: TiVo *(continued)*

The reason the TiVo creators made these principles was not only to help guide the experience of using TiVo, but also to remind the internal team not to think about the TiVo device as a computer (which it essentially is—a large hard drive and the Linux operating system). Users weren't going to use it like a computer—they were going to be on their sofa, 10 feet away from the screen, wanting to be entertained and not wanting to make a lot of choices. Since it was a new technology, its adoption depended on its design to demonstrate its value.

The Solution

There is little doubt that TiVo changed the nature of television. Dozens of accolades and even Emmys for their product have followed in the decade since the service was initially launched. Some of this is clearly due to the adherence to the set of design tenents, which even today differentiate them from their competitors. TiVo is still frequently listed on the Best Products of the Year awards.

Once you have your design principles, you can use them as a measuring stick against the concepts you've generated to see which ones best fit. Hopefully several ideas will work within the guidelines, or could be tinkered with to fit.

But design principles can also be used from this point in the process forward to help make design decisions. When there are multiple options to choose from ("Should we ask users first, or just do it for them?"), the design principles can sometimes help make the correct decision clear.

Design principles can sometimes outlast the specific product itself, or even be extended across lines of products to give them all a similar grounding.

Summary

Brainstorming can be mysterious. Frequently an idea will come to you when you are not in a brainstorming session. Ideas seem to have a life of their own, but they can sometimes be coaxed into existence, and that's what you hope ideation will do.

The design principles you create are a way—granted, a subjective way—of measuring your ideas for value and feasibility. Of course, the only way to really tell if an idea is a good one is to play with it, test it out, and refine it. That is the topic of the next chapter.

For Further Reading

Six Thinking Hats, Edward de Bono

A Technique for Producing Ideas, James Webb Young

Thinkertoys: A Handbook of Creative-Thinking Techniques, Michael Michalko

The Seeds of Innovation: Cultivating the Synergy That Fosters New Ideas, Elaine Dundon

7

Refinement