# DESIGNING FOR THE DIGITAL AGE

## HOW TO CREATE HUMAN-CENTERED PRODUCTS AND SERVICES

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# Principles and Patterns in Design Language

The focus in defining a product's form factor and interaction framework is largely on utility: identifying what solution will best accomplish the job in the simplest way. However, good design balances utility and usability with desirability or other appropriate emotions—a consumer entertainment product may evoke feelings of desire, a medical product should simultaneously look precise and reassuring, and a business product should convey no-nonsense professionalism. Design should also express a product's brand and make it identifiable as coming from a certain company, whether with unique signature elements or a more understated style that is nonetheless consistent.

Experience attributes, discussed in Chapter 12, describe this intersection of user emotions and expectations with brand qualities. The **design language** expresses those attributes, along with the practical information the design must communicate, in visual and physical form. This chapter briefly describes some of the most important building blocks you need to express various qualities. If you studied graphic design or industrial design in school, you can probably skip ahead to Chapter 18, which describes how to develop design language directions in a way that helps

stakeholders see your reasoning. This chapter is intended to help jack-of-all-trades designers make better visual decisions and to help those without a classic design education be more effective reviewers of design language.

## General Principles

Like all aspects of design, the design language should adhere to the design values discussed in Chapter 15: It should be ethical, purposeful, pragmatic, and elegant. An ethical design language may involve minimizing eyestrain or choosing materials and processes that are less damaging to the environment. It minimizes work by making it clear what elements do and making it easy to find the most important information and controls. In a purposeful design language, there is a reason for every decision about color, shape, and other elements. A pragmatic design language considers whether a form or material will be difficult to clean, or whether semitransparent interface elements will be unreasonably difficult to code. An elegant language is unified across hardware, software, and service elements, and uses the smallest effective difference to communicate.

Many design principles become more critical during detailed design, but a handful are important to consider as you begin exploring the design language. These are outlined in the following pages.

## Visual information + context = meaning

Although you may think of the visual aspects of design as being pretty far removed from science, an understanding of human perception—how our brains interpret what we see—is essential to any visual communication, whether of data or of brand. Simply put, our eyes pass visual information to the brain, which latches onto only the essential part of that information. We're quick to focus on movement and recognize basic shapes at first glance. This makes biological sense, since responding to the movement and silhouette of a predator was a good skill for survival in a primitive world. Color is another attention getter; no doubt the ability to spot a red fruit in a tree once meant not going hungry. We are slower to respond to more detailed information such as texture, perhaps because it is not so closely linked to survival.

Visual information only assumes meaning with our context and experience, however. Consider the "+" shape in Figure 17.1. In one context, it means the viewer should add numbers together, but in others it might indicate that there's an intersection ahead or that disaster relief has arrived. To a small child, perhaps none of these symbols has any meaning. To someone in Istanbul, a red crescent would be more meaningful than a red cross.

For this reason, context is essential to every visual design decision. Yellow as a dominant color might be seen as bright and warm, but yellow used as a highlight on certain controls or data might indicate a warning. An icon of a cylinder might say "database" to a technical user and "mysterious cylinder icon" to another. A style that seems friendly and approachable to someone intimidated by technology might feel childish or simplistic to a more knowledgeable user.



Figure 17.1. Meaning depends on context.

## Visually communicate what elements do

The design language is a form of communication. It sets a user's expectations about her experience of the brand and the product. It also implies what various parts of the product do: A protruding handle says it should be pulled, a three-dimensional look hints that a button made of pixels is clickable, and a scroll bar implies that there's more content below what you can see on the screen. This visual hinting at function is called an **affordance** (after James Gibson's 1977 work, "The Theory of Affordances"). Figure 17.2 shows some typical software UI affordances: Textures on the corner of a window and the edge of a pane indicate that they're movable, and a three dimensional treatment on the scroll bar controls hints that they can be clicked.

Avoid setting false expectations with your affordances; Figure 17.3 illustrates the classic example. I once saw a medical device that consistently suffered cracking at one edge of an access panel because a concavity there implied

"grab here to open," when users actually had to unlatch the panel along the other side. An affordance can be so strong that it's difficult to overcome, even with time; you probably find yourself pulling on the protruding handle of a door you've gone through dozens of times even though you know you need to push it.

The illusion of dimensionality on a screen won't cause breakage but will cause frustration if you
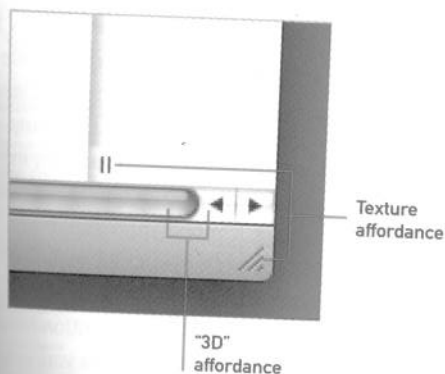
use it on visual interface elements that can't be manipulated. However, complete lack of appropriate affordance implies that something cannot be manipulated. This problem is common to many Web sites, though experienced Web users have learned that a row of labels across the top or down the left of the screen is clickable, even with no other visual indication.

## Have a purpose for every element and a reason for every decision

Every visual element, like every functional element, should have a reason to exist. Those reasons can be functional in themselves; a slight gradient, for example, can be used to give a button a clickable affordance. Even decorative elements can exist for a reason, though. The subtle gleam and reflection Apple uses on its Web site (in Figure 17.6) and in its software (such as the iTunes image in Figure 17.4) hints that their products are shiny, new, and perfect. The boxes and borders within borders in Figure 17.5, on the other hand, have no evident purpose and are therefore distracting.

In addition to having a rationale for every element to exist, you should also have a reason for why you



Figure 17.2. Textures and dimensionality indicate the on-screen items can be manipulated.



Figure 17.4. The subtle reflections in Apple products and marketing materials exist for a reason.



Figure 17.3. Whatever the text says, the protruding handle yells, "Pull me!"



Figure 17.5. This search tool includes unnecessary visual elements, such as the multilayered border on the search entry field.

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You'll make better design decisions—and be better at explaining them to stakeholders— if you and your teammates have a reason for every choice.

shaped, colored, or textured it a certain way, either based on usability considerations or on reinforcement of the experience attributes. I once had an industrial designer say to me that the hardware buttons on a glucose meter should be arranged in a certain way to look like a paw print. He couldn't say why this was good; it detracted from the usability and had nothing whatever to do with supporting the brand. This is an extreme example, but you'll make better design decisions—and be better at explaining them to stakeholders—if you and your teammates have a reason for every choice.

### Repeat elements for unity

Repetition of a shape, a color, a material, or a texture can bring unity to a single design or even an entire product line. (Conversely, varying elements for no particular reason makes visual communication less clear.) Just take a look at the Apple products pictured in Figure 17.6. Nearly every product you see uses the same curvature on the corners or, in the case of the iPod Shuffle, on the vertical edges. This shape softens Apple's "shiny and high-tech" image to make it more approachable. Most of their products also employ white plastic or brushed metal. Now look at the visual language of the Web site itself, and you'll see the same curved corners and metallic accents. This subtle repetition helps keep a fairly busy page from being overwhelming. It also tells you everything you're looking at is from the same company.
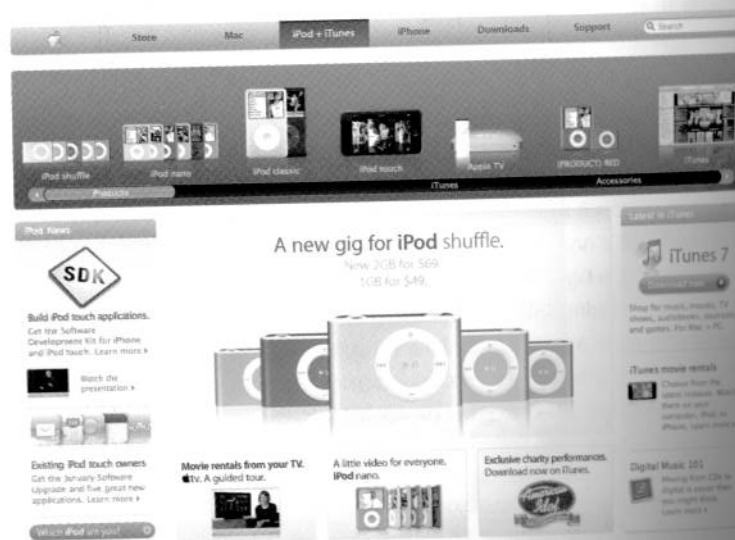


Figure 17.6. Repetition of the same elements in the physical and visual design language.

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Figure 17.7.
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Of course, heavy-handed repetition can wind up looking clumsy, especially if it uses elements that don't exist for a clear reason. Look at the fictitious (but not unrealistic) Web site in Figure 17.7. Slices off the upper corners of several elements echo the navigation buttons. The texture on some headers is also repeated, as are the arrows on some buttons and links. These elements are not at all subtle, though, and they appear to be applied somewhat randomly, so the overall impression is clumsy rather than unifying.

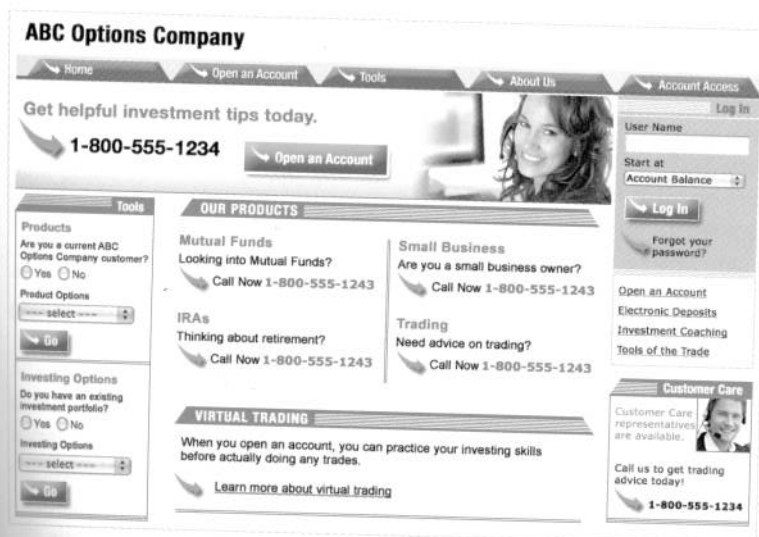**Be decisive, but use the smallest effective difference.**



Figure 17.7. The repeated elements in this Web site seem arbitrary and heavy-handed.

## Be decisive, but use the smallest effective difference

If you're using a contrast in color, size, or some other characteristic to convey meaning, that contrast only works if it's decisive. An excessively subtle distinction also adds cognitive work as a viewer tries to decipher whether it is meaningful. However, overly sharp distinctions can look amateurish. In Figure 17.8, for example, you can barely tell that the text on the top is rendered in two different point sizes. The text on the bottom looks awkward because the difference is too great. The text in the middle shows a clear distinction that isn't overdone. Figure 17.9 shows a real example of an exaggerated difference.

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| 10 point | 11 point |
| 10 point | 12 point |
| 10 point | **16 point** |

Figure 17.8. Use the smallest effective difference.

### Select an Action

| | Scan my Mac |
| | Protect my Mac: ON |

### Status and Summary

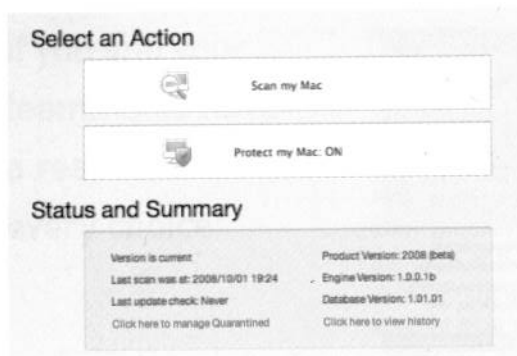| Version is current | Product Version: 2008 (beta) |
| Last scan was at: 2008/10/01 19:24 | Engine Version: 1.0.0.1b |
| Last update check: Never | Database Version: 1.01.01 |
| Click here to manage Quarantined | Click here to view history |

Figure 17.9. An example of too exaggerated a difference in an antivirus application.

## Patterns and Principles for Specific Elements

In order to represent qualities in visual and physical terms, you need a vocabulary of patterns. In the realm of design language, patterns are primarily centered on how to manipulate visual elements such as color, shape, and size to evoke certain associations and emotional responses. I've also included a few element-specific principles that are worth considering at this stage of design; you'll find more in Chapter 21. Many of these concepts are worth whole books in themselves, so my intention here is just to highlight a few key points.

## Color

You can use color for many purposes, most commonly to draw attention to important information or controls, show relationships, evoke particular emotions, or reinforce a brand identity. Your use of color to evoke emotion or enhance usability will be more effective if you understand certain properties, principles, and patterns.

Every unique color can be described in terms of three different properties. **Hue** is what we normally think of as color; red, yellow, and blue are all hues. The intensity of the color is described as its **saturation**. Green is a saturated color; khaki, which is green plus gray, is desaturated. The lightness or darkness of the color is its **value**; white is a high-value or bright color, while black is a low-value or dark color. Figure 17.10 illustrates these three properties of color. A **tint,** such as pink, is the pure hue with white mixed in, while a **shade,** such as maroon, is the pure hue with black mixed in. Some hues are naturally higher value or brighter than others; yellow, for example, has a higher or lighter value than purple. People who are entirely colorblind cannot really distinguish one hue from another if all hues are of the same value, but may be able to distinguish yellow from purple because of the difference in value. You may also hear about color **temperature—** red, orange, and yellow are seen as warm in most situations, while green, blue, and purple are seen as cool.

Our perception of color is not absolute; a color that seems very green in one context may seem blue in another. A bright blue paired with saturated red is anything but cool. Unfortunately for digital design, color also varies widely depending on the display type; even a single screen's color rendition can shift over time. Unless you control the hardware and its settings, you'll need to try colors on many displays to see how they look under various conditions.

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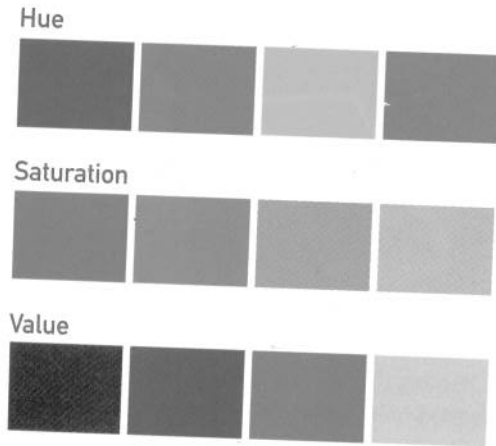Framework

Hue

Saturation

Value

Figure 17.10. Every color can be described in terms of its hue, saturation, and value.

## USING COLOR TO ENHANCE USABILITY

Although many usability decisions regarding color come later in the process, your choice of color palette now can have quite an impact later on. Consider the following principles in determining what palettes may work.

### A little color goes a long way

Using one or two contrasting colors can reduce visual work by emphasizing important elements and improving scan speed, but overly complex color coding of data and controls increases cognitive load and memory work. Avoid using more than half a dozen or so hues in any color coding scheme, though you can use multiple values of the same hue to indicate gradation, such as water depth on a map. As you can see in Figure 17.11, it's much easier to spot the orange circle when it's the only one that's colored.
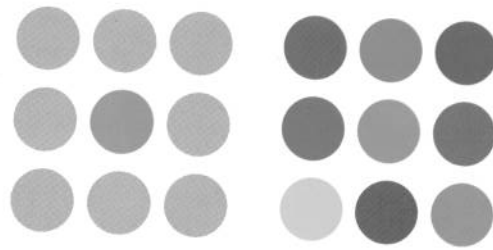
Figure 17.11. Too many colors obscure differences.

### Use warm, bright, saturated colors for emphasis

Warm, high-value, saturated colors emphasize information and make it pop (see Figure 17.12). Dark, desaturated, cool colors cause information to recede. Any color contrast will draw attention, but reds, yellows, and oranges will generally do so more effectively than purples, blues, and greens. However, avoid using one saturated color on top of another because it causes eyestrain. This is especially true with blue and red, which seem to vibrate, causing a condition known as **chromostereopsis** (or in simpler terms, a guaranteed headache), illustrated in Figure 17.13. In hardware, you can use illumination of labels or of entire controls to achieve additional emphasis, or to provide the function of color in a low-light environment.

Warm, saturated colors pop

Cool, less saturated colors recede

Figure 17.12. Use warm, saturated colors for emphasis.

Chromostereopsis

Figure 17.13. Chromostereopsis—dreadful, isn't it?

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Figure 17.14. Contrasting part colors can change the visual impression of mass made by hardware.

## Dominant brand identity colors may make poor dominant interface colors

If the dominant color in your company's identity is something assertive like bright red, it probably makes a lousy dominant color for your interface because it drowns everything out. It's a bit like having someone write a letter in all caps; it shouts at the viewer and makes it impossible to see subtle distinctions. Instead, use very bold colors only for accents in the interface; use more subdued colors in most cases for backgrounds and large areas of screen real estate.

## Use different values to minimize perceived device size

Contrasting values on physical parts can help make a product appear lighter and smaller. For example, if you use a light color for the upper bezel of a product and a darker value for the bottom part, the lighter-colored part may leave the impression that it's the entire product at first glance. Strong contrast can also make users focus on a specific part and tune out the rest. Compare the two phone renderings in Figure 17.14. The one with the silver screen bezel draws attention to the display, while the one with a body-color bezel leaves a more massive impression.

## Don't rely solely on hue to communicate

Approximately 8 percent of men and 0.5 percent of women[1] are at least partially colorblind, so you should never rely solely on hue to communicate. Always use some additional communication vector, such as texture, size, or contrast in value. This will also prove useful when users send information from a screen to a black-and-white printer. In Figure 17.15, the image on the right has been completely desaturated to simulate the effects of color blindness; the result is that the most important control on this defibrillator now looks like the least important.
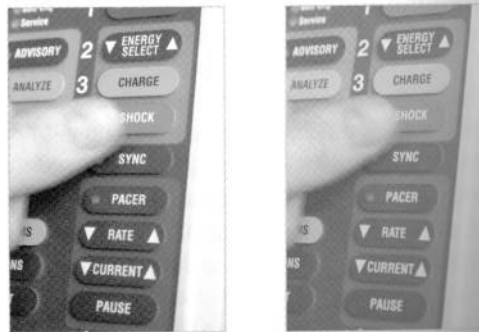
Figure 17.15. Effects of color blindness.

1. National Institutes of Health. http://ghr.nlm.nih.gov/condition=colorvisiondeficiency.

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## PATTERNS FOR COMMUNICATING EMOTION WITH COLOR

Along with physiological responses that are independent of culture, colors elicit associations, memories, and other more context-dependent reactions; white is the color of weddings to some and of funerals to others. In general, tints of nearly any color are seen as softer. Shades, the darker variants on any color, are usually seen as more mature and powerful. A shiny, metallic version of any hue is richer, colder, and more high-tech. Sharp contrasts in color are always more bold and decisive; using closely related colors makes less of a statement.

Red stimulates excitement and energy. The color of blood and stop signs, it is often associated with danger. Warm tomato red also conveys outspoken prosperity and power (doubtless one reason red sports cars are so popular). It's the color of good fortune in China. Cooler, darker reds, such as burgundy, are seen as more mature and refined and are a good choice for conveying understated wealth and luxury.

Pink, a tint of red, elicits a wide range of responses. Bright, shocking pinks convey the same high energy as red, but without the same associations of class and power; if anything, pink is seen as trendy, feminine, and possibly cheap. Reddish-purple pinks are more grown up. Bubblegum pink can be sweet; in the wrong context, it may be cloying. A rose pink implies health and warmth.

Orange is vibrant, playful, youthful, and friendly. It's a bold, modern color that's hard to ignore. It is seldom associated with sophistication or wealth. Lighter peach tones seem soothing and approachable.

Yellow is the color of sunshine, cheerfulness, and bright ideas, which makes it suitable for the simple, friendly tone of the application in Figure 17.16. Bright yellow is highly noticeable. Used as an accent color, particularly in combination with

red and green, yellow may communicate caution or slowness; combined with black, yellow always attracts attention and may signify danger. Greenish yellows may be associated with acidity and may not be well received in Western cultures except by children and teenagers. Pastel yellows are seen as soft. Golden, brownish yellows are warm, welcoming, and homey.
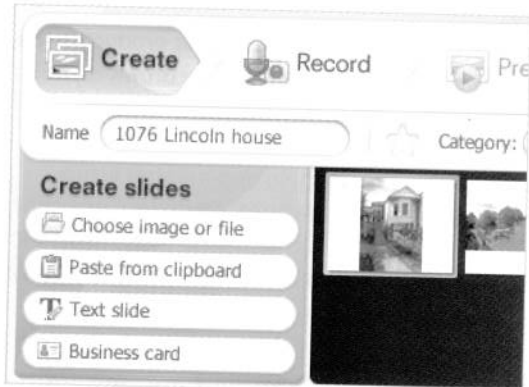


Figure 17.16. Goldmail, a simple application for assembling and mailing voice-over slide shows, uses plenty of bright yellow to emphasize its simplicity.

There's a reason so many health-care environments are blue; light and mid-range blues are restful and soothing. Blue and pure tints imply cleanliness, especially when used with white, but may be seen as cold. Darker blues such as navy are reliable, mature, and authoritative without being as ominous as black. Used with a bit of gloss or sparkle, blue can be electric and lively. Teal, a greenish blue, says your product is unique, but these in-between hues often go in and out of style.

Greens are usually associated with nature. They seem cool, clean, and calm. Light greens are fresh, while darker greens are seen as more conservative and prestigious. Bright, yellowish greens can be bold, modern, and high-tech. Mint greens are refreshing and cool.

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Purple can be bright, electric, and futuristic, with darker shades and desaturated hues seeming more quiet and sophisticated. Light purples, such as lilac, are sweet, soothing, and unobtrusive. However, associations with purple may be less predictable than associations with other colors, so although it's an appropriate color for SciFi.com, it's a risky choice for many applications. If nothing else, purple says your product is unique.

Nearly any hue of brown says your product is reliable, durable, and approachable. Brown is the color of the earth and is therefore substantial and stable. Chocolate brown has come to be associated with a certain understated luxury, particularly if it has a sheen. Of course, brown can also be associated with dirt, which makes it difficult to use in health care applications. Brown is not the color to use if you want to say that your product is cutting edge and dynamic (which makes Microsoft's choice of brown for its first-generation Zune media player a peculiar one).

White says clean, bright, and pure like no other color. White is modern and minimalist, but can be seen as stark if not relieved by some other hue. It can be warm and sophisticated with the slightest hint of yellow or brown added to it, or it can be cool and nearly invisible with just a touch of blue or gray.

Black is dramatic, powerful, and often elegant. A glossy black is high-tech. A matte black may be rich and sophisticated. Black is massive; it implies solidity and durability. All these qualities make black a suitable dominant color for Autodesk.com, shown in Figure 17.17, since the company makes powerful software used by designers, architects, and engineers. Black accents are sharp and decisive. Too much black can be ominous.

Gray is unobtrusive, which can make it a worthwhile choice as a backdrop. It can also be seen as indecisive; it lacks the purity of either black or white, so it's never going to make a very bold statement.



Figure 17.17. Autodesk's black Web site background implies that they have seriously powerful technology.

Silver is gray's wealthier sibling; a matte silver finish is precise yet unassuming, while large quantities of chrome can be flashy and outspoken.

## Size

No doubt you know that controls and data should always be large enough to find, read, and use under typical conditions, but size can be manipulated for other purposes. Varying the size of elements and information can enhance usability by creating a clear hierarchy and drawing attention to the most important items. The overall size of controls and text also creates an aesthetic impression. In general, large controls and text appear friendly, simple, approachable, or playful. This makes large controls a good choice for children's toys or some consumer products, but usually a poor choice for tools that are meant to appear professional, sophisticated, or powerful. Compare the elements from iPhoto, Apple's consumer-oriented photo manager, with those from Aperture, its professional cousin, both shown in Figure 17.18. This association of simplicity with larger controls can be challenging when you want a professional or sophisticated-looking touch screen application or automotive interior, in which large type and controls may be necessary for usability.
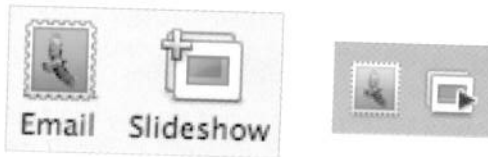
Figure 17.18. The presence of text labels and a difference in text and icon size distinguish a consumer application from a professional one.

## Shape

An object's shape, particularly from the most common viewpoint, is one of the first things people recognize about it. Although the average Web site or desktop application tends toward rectangles for efficiency's sake, the other shapes used in any application or device can make it seem precise or approachable, luxurious or practical, sophisticated or down-to-earth. Rounded corners are soft, human, friendly, or simple—even childlike. Eggs, pebbles, and most living creatures are made up of curved surfaces, so shapes with curves are seen as more organic and natural. Complex shapes imply a certain attention to detail and the resources not to be strictly practical; they're also less recognizable at a glance. Compare the cell phones in Figure 17.19. One is rounded and foreshortened, which makes it seem friendly and young, while the other's more elongated, generally rectangular form makes it look more like a grown-up business tool.

However, there's a pragmatic side to the shape of a device. Shapes provide affordances that tell users what an object does and how to pick it up and hold it. An object's shape also affects how easy it is to drop, how well it withstands damage, and how easy it is to clean. Ridges and sharply angled indentations, for example, tend to retain grime, which can make a kitchen appliance or hospital device look anything but pristine after a while.

In software, sharp corners and an ordered layout grid appear clean, modern, and precise. Taken too



Figure 17.19. Different shapes give otherwise similar phones a very different feel.



Figure 17.20. The image of the chair keeps the grid from being too static.

far, rectangles can be dull. Notice how the Crate and Barrel Web site pictured in Figure 17.20 uses an irregularly shaped product, shot at an angle, to break up what might otherwise be a static grid, without losing its overall clean and modern look.

## Line weight and style

Thin, sharp lines look precise and sophisticated, while thick, bold ones are simple, friendly, and perhaps childish. Compare the thin, low-contrast lines used on the Volvo Web site in Figure 17.21 with the thick, high-contrast lines used on the
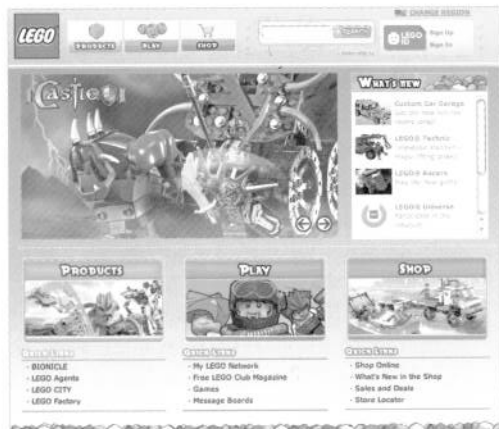
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Figure 17.21. The line styles used in the Volvo, Lego, and Cost Plus World Market Web sites all imply very different brand attributes.

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Lego site. Irregular or patterned lines can have many characters; they can be casual, sophisticated, or playful depending on the exact treatment, but are probably not going to look precise or clean. Cost Plus World Market, for example, uses a variety of decorative line styles on its Web site to imply that its wares are exotic.

## Type

Due to the low resolution of a screen in comparison to print, many typefaces are inappropriate for screen use except at large sizes used for decoration or headings. In general, a good screen font has a wide punch width, wide letter spacing, tall x-height, and simple strokes (see Figure 17.22). Sans-serif faces such as Verdana and Tahoma are usually more legible than serif fonts, especially at small sizes. Most visual designers try to avoid Arial because it's an overused and poorly-executed imitation of Helvetica. A few serif fonts, such as Georgia, have been specifically designed for the screen and are legible at reasonable sizes.

**Verdana** — Wide letter spacing / Wide punch width

**Georgia** — Tall x-height / Simple strokes

Figure 17.22. Characteristics of a good screen font.

When it comes to emotion and branding, the corporate identity system is usually the best place to start. However, the identity fonts are often best applied to headers and other large elements rather than to the majority of a screen's content, since they are often selected without low-resolution displays in mind. Although typefaces vary widely in personality, in general, serif faces are classic, sophisticated, and sometimes a bit conservative. Sans serif faces provide a clean, modern look. Use script or very eclectic faces sparingly and with good reason.

## Texture

Technically speaking, texture is a physical attribute we experience through the sense of touch. In industrial design, texture is partly a matter of material choice and process and partly a matter of deliberate application. A texture can be inherent in an authentic material, such as a leather or wood, or it can be designed in a mold to add aesthetic richness, clarify an affordance, or perhaps make a grip more secure. However, we also perceive texture visually; something with bright highlights and a clean gradient looks hard and smooth, like a polished stone or the product of a high-tech process. An image with a subtle mottling seems like it might be soft to the touch. An interface control depicted with subtle ridges provides an affordance that says you can grip and move it. All of the visual textures take on the emotional qualities of the materials they mimic.

Because texture is one of the last visual properties we notice, it's not a good choice for calling out important information; if you use contrast in texture to communicate about anything other than emotion, reserve it for low-priority distinctions.

## Images

Aside from icons, imagery is seldom used in applications, but is a critical component of most Web sites. Effective use of imagery is worth a graphic design course in itself, so I'll limit discussion here to a few key points.

The first question is whether to use photography or illustration. Photography is often the best choice; it imparts a polish that's difficult

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Figure 17.23. If you were designing a Web site for a taxi service, what would each of these image styles imply?

to achieve with illustration. However, illustration can be informal and friendly. Both photography and illustration can look amateurish if poorly done. In either case, the image style should be consistent with the brand and experience attributes. Illustrations take their style from the elements described above: color, line, shape, and so forth. Photos take their style from the camera angle, depth of field, lighting, and other attributes; objects and people on clean white backgrounds look simple and precise. People in realistic environments are more human. Objects and people in motion are more exciting and dynamic. Compare the images in Figure 17.23.

## Materials and manufacturing

Although many of the visual elements described in the previous pages are shared across hardware and software, hardware is unique in that it is made of materials by means of manufacturing processes. Material qualities such as weight, density, flexibility, porosity, and thermal properties affect choice of manufacturing technology, resistance to damage, ability to disperse heat, and many other properties of concern to engineers and industrial designers. However, a complete course in materials science is well beyond the scope of this book; let us instead focus on how materials and manufacturing methods elicit emotional responses. For example, compare the images in Figure 17.24. Which looks more precise? Durable? Cold? Expensive? Approachable?
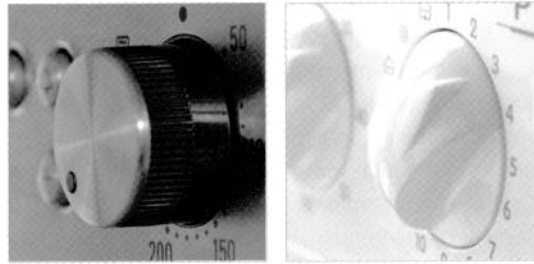


Figure 17.24. These materials and finishes leave different impressions.

## AUTHENTICITY

It's relatively common to find imitation materials in physical products, usually due to cost or sometimes functional necessity (an all-metal cell phone, for example, might have problems with the material blocking the cellular signal). Material imitation effects usually involve applying a secondary finish process—such as painting or applying a thin film with an image on it—to an ordinary plastic part. No doubt you've seen this kind of thing on the "wood" panels in a car. Another option is to engineer special plastics that have other compounds, such as metal flakes, mixed in. Although these processes can add visual richness to a product, it's difficult to imitate the tactile qualities of real materials, so the end result can often seem cheap. These finishing methods can also introduce problems with durability and recyclability.

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Framework

## "TEMPERATURE"

Some materials seem warm while others appear cold. This is not due to actual temperature, but to the conducting or insulating properties of the material; metal feels cold because it conducts heat away from the skin, while wood feels warm because it is a poor conductor of heat. Materials we don't inherently associate with temperature, such as plastic, are likely to take on the "temperature" qualities of their colors and finishes instead; plastic painted to mimic metal looks nearly as cold, though it seldom fools the sense of touch.

## "SOFTNESS"

We associate softness with materials that are smooth and not stiff. A baby's skin and hair are soft because of their fine texture; a smoothly finished piece of wood furniture can likewise feel soft to the touch, though we know it is actually fairly hard. Rubber, because it is flexible, leaves an impression of greater softness than plastic or metal. However, even a smooth and flexible material is unlikely to be perceived as soft if it has a glossy finish and sharp edges. An area that looks soft, such as the rubber handle on a hammer, tends to imply that users should grip there.

## "DURABILITY" AND SUITABILITY

To an engineer, durability is about tensile strength and resistance to impact and wear. To a user, these qualities often have more to do with weight, density, stiffness, and proportion. Something that is heavy and inflexible seems more likely to endure; metal hinges and casings leave an impression of higher quality than the same components made of plastic. Things that simply look heavier and chunkier are assumed to be more robust. A heavy car door that closes with a satisfying thump implies that you're driving a well-made, safe piece of machinery.

Of course, there are pragmatic considerations; materials should certainly be able to withstand typical conditions. A mobile device that gets thrown in a purse or carried everywhere will be subject to scratching. The plastics in a hospital device should withstand frequent cleaning with harsh chemicals. A glossy finish won't look so precise and special when covered in smudges. Any material that's more suited to the showroom than the usage environment will eventually cause some dissatisfaction.

## MANUFACTURING AND PART ASSEMBLY METHODS

The average end user can't define the difference between injection molding and thermoforming, but will tell you that the product with precise joints looks better made. However, highly visible part lines, exposed bolts, and welded seams provide an appearance of industrial strength and robustness in certain product categories, whereas hidden fasteners and sharp contrasts in materials that emphasize precise part breaks imply precision and quality in consumer electronics.

### Exercise

Look at a couple of different Web sites you don't normally frequent. Look at your cell phone and at the dashboard of a particular car. What attributes would you ascribe to these products based solely on the design language? Deconstruct the design: How do specific choices of shape, color, line, type, size, texture, images, and materials contribute to that impression? What design language choices, if any, seem at odds with the rest?

## Signature elements

Combinations of various visual and/or physical properties can be used as **signature elements**:

Framework

unique treatments of a brand identity or functional elements that are highlighted in some special way, usually across multiple products. Cars are well known for signature elements, such as BMW's distinctive front grilles or Volvo's flared tail lights (which you can see in Figure 17.21).

Some signature elements involve special treatment of a company or product identity. Dell computers all have the company's logo represented on top of a round, convex silver "badge" that contrasts with the surrounding material; this makes the products recognizable from a distance and, on close inspection, celebrates the logo as a mark of quality. The Microsoft Office button (see Figure 17.25) aims to accomplish something similar in software, though one might argue that it's less effective than many physical signature elements.
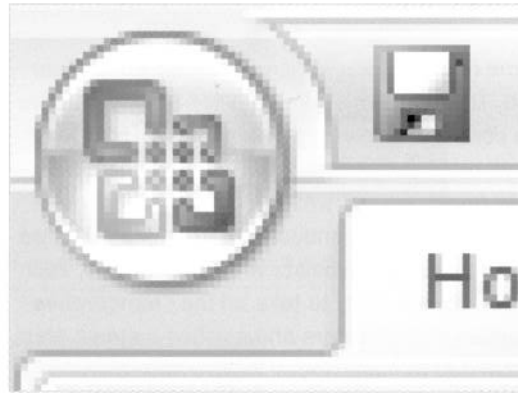


Figure 17.25. The Office button is a sort of software signature element.

Other signature elements are functional, such as Apple's use of the click wheel on most of its iPods or Oxo's black rubber handles on kitchen gadgets.

## Summary

Although there will always be an element of subjectivity to what makes a "good" design language, by understanding how different visual properties are perceived, you can learn to make better decisions and communicate about why they're good. As Chapter 18 will show, you can use this knowledge to encourage stakeholders to discuss design language decisions in terms of relatively objective attributes rather than entirely subjective personal preferences.

Of course, design language is always some combination of emotion and usability; while you're figuring out how to convey the right attributes, step back and consider how colors, typefaces, materials, and other aspects of the design language will affect the practical aspects of the experience; putting your own brand imperatives before user needs will *always* undermine your message.

# Developing the Design Language

The appearance of any product or environment will always say *something* to the people who look at it; a designer's job is to ensure that it says what it should by establishing an appropriate **design language**. To most people outside the design team—and even to some design team members who are not responsible for it—this design language development is often a mysterious process. Many designers make it seem even more mysterious because they can't explain how they arrived at the design language they're showing. In the absence of clear rationale and assessment criteria, stakeholders tend to evaluate the design language based on personal preference or to rely on the inexpert opinions of a focus group to choose the appropriate expression of their product's brand.

Although developing a design language is largely a matter of experience and skill in manipulating visual (and sometimes physical) properties, the process described here will help you focus your skills and educate stakeholders. The point of design language exploration is *not* to provide untutored stakeholders with an a la carte menu from which they can pick and choose colors, type, and materials; rather, it is to help them select a clear visual communication strategy based on sound reasoning.

You may be able to skip this chapter if you're working on a product that has an established design language, though even in this case it's important to understand and communicate the effect of specific design decisions on the visual messaging.

## The Process of Developing the Design Language

Much of what's described in this chapter happens invisibly inside the head of an experienced designer, but is worth discussing with a colleague nonetheless, especially if you're new to this activity. As usual, the process is most easily explained in linear fashion, though in reality the thought process is more iterative.

Informed by your research and personas, you might begin by looking at other product categories, environments, or elements of the natural world for inspiration to help inform your use of visual and material properties. It's best to discuss certain characteristics of your studies with the rest of the design team before you begin to render them, though.

**Unless stakeholders are unusually sophisticated consumers of design, most have great difficulty separating the interaction from its visual representation.**

As with developing the interaction framework and physical platforms or architecture(s), you'll need to determine right away how many directions to share with stakeholders. These directions are embodied in **design language studies**, which are the equivalent of fabric swatches and paint chips that show elements of the design language working together, though not necessarily in the context of the interaction framework or hardware architecture.

A visual language study for on-screen elements is usually best divorced from the interaction design sketches except when the project is simply a visual upgrade of existing interaction design. Unless stakeholders are unusually sophisticated consumers of design, most have great difficulty separating the interaction from its visual representation, even if you have already discussed the interaction design with sketches. If you show visual design applied to an interaction design they don't understand or don't agree with, many stakeholders won't be able to get past that. Likewise, if you describe rough interaction with images that include detail about color, type, and texture, stakeholders tend to focus on these visual elements rather than on structure and flow. However, there are exceptions to this general rule; a friend of mine who works at Apple says the emphasis on the visual is so strong there that stakeholders would be unwilling to accept rough interaction sketches divorced from visual design, even though this adds considerable time to the design schedule.

An industrial design language is possible to illustrate with sketches of hardware details, but this more abstract approach can be difficult for stakeholders to interpret, so an industrial design (ID) study is usually a rendering of surfacing, colors, materials, and finishes applied to an entire device. However, the same problem with conflating functional design and design language applies, so if you haven't focused on a single architecture yet, this is usually a generic device sketch (like the one in Figure 16.3) that's similar to, but doesn't quite look like, any of the candidate architectures. The final architecture is an appropriate basis for studies if you've settled on a single direction or are simply restyling an existing architecture. It often does not include every control or final placement of elements, since these depend on a variety of issues yet to be explored. It would be nice to show each design language direction applied to each physical architecture if you haven't settled on one, but this is seldom possible within a typical design budget.

Studies for environments, wayfinding, or other experiences that aren't simply about hardware and software may take other forms. A study for a retail environment would include sketches of the interior space, images of commercially available furnishings and fabrics, and so forth. A study for wayfinding in an airport might include a few example
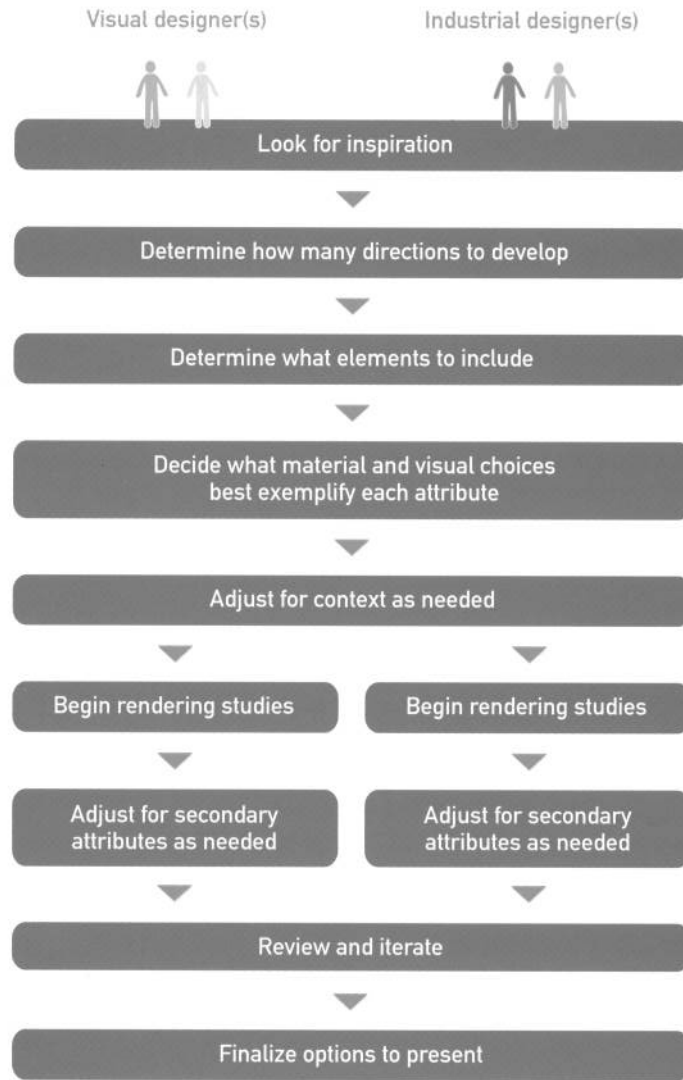
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Visual designer(s)  Industrial designer(s)

Look for inspiration

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Determine how many directions to develop

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Determine what elements to include

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Decide what material and visual choices
best exemplify each attribute

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Adjust for context as needed

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Begin rendering studies　　　Begin rendering studies

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Adjust for secondary
attributes as needed　　　Adjust for secondary
attributes as needed

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Review and iterate

▼

Finalize options to present

Figure 18.1. Overview of design language development.

renderings of signage using various colors and typefaces, along with a simulated image or two of those signs in context.

Once you develop a range of potential directions, you should review them with the entire design team, select which options to present to stakeholders, and iterate them as needed. Figure 18.1 provides an overview of the process.

## Look for inspiration

Experienced designers rely on a large vocabulary of design language patterns like those described in Chapter 17, but many still find it helpful to look for inspiration in other products—especially in other genres—and perhaps even in nature. A kitchen appliance could inspire the form or control panel of a scientific instrument. The luster of a
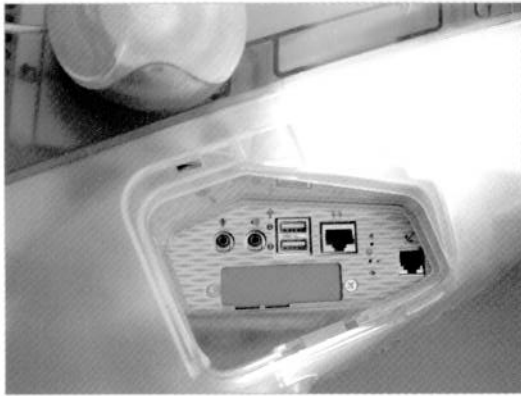
Framework

Figure 18.2. When the original iMac was a hit, even irons started using white and translucent teal.

seashell could inspire the finish on a cell phone. A sports car might provide an idea for a repeated element in an application's visual language.

You probably started looking for inspiration during requirements definition (see Chapter 12) when you assembled images that conveyed appropriate attributes, so it's seldom worth spending much more time on this. Studying any particular product too closely may yield a "me, too" design language; when the original iMac was released in 1998, for instance, even vacuum cleaners and clothes irons were suddenly sporting shiny, white finishes and translucent, blue-green plastic accents (as in Figure 18.2).

## Determine how many directions to share

Even one visual choice, such as color, can have a tremendous effect on how a product is perceived. This makes it worthwhile to explore multiple directions for the design language as long as you can afford a week or two (depending on whether the ID studies are hand sketches or loose 3D renderings). If you can't, you might need to develop a single reasonable direction that will be "good enough." This may not be faster in the end, though, if stakeholders are unhappy with the direction.

The experience attributes (Chapter 12) guide the design language exploration much as persona goals and scenarios guide interaction and form factor design (Chapter 16). There is a natural tension among the experience attributes; your product may be meant to convey both simplicity and power, but the visual and material properties that say *simplicity* are not the same ones that express *power*. Trying to depict three or four attributes with equal emphasis on each would be like trying to make yourself understood in a crowded, noisy restaurant—your message would be lost entirely.

For this reason, each study focuses on just one primary attribute. If you have four experience attributes, this means developing a minimum of four design language studies, though you may develop additional studies per attribute as you have time, then eliminate the less-effective ones. (It's sometimes possible to skip an attribute if it is largely hygienic—i.e., a must-have to be on par with the competition, such as *sturdy* with respect to industrial machinery or *friendly* for preschool educational software—but this is not common.) This is not to say that any of the studies should completely ignore any of the attributes, but that each study should lean in one direction or another. The other attributes are

treated much like secondary personas: Tweak the design to accommodate them, but not to the extent that you overwhelm the primary attribute.

It's entirely possible that the final design won't look quite like any of the studies; in fact, this is usually the case. However, the studies are an effective tool for helping stakeholders say, "This direction seems almost right; that one is definitely not right." The idea is to explore a broad range in these small, inexpensive studies to help stakeholders agree on a strategy; this also lets you get most of the design language settled before applying it to increasingly expensive physical models or multiple screen states.

Some designers are able to generate many options with incredible breadth, each looking entirely different from the last. Most designers have a somewhat narrower range, which makes it advisable to assign two or more visual designers and two or more industrial designers to this effort if you can afford to do so—the less overlap in their stylistic tendencies, the better. One designer can do a fine job on a tight budget, however, and a visual designer and an industrial designer working together will each stretch the other's thinking.

Studies for visual and industrial design are closely related in that they should use related shapes and textures; the on-screen elements, for example, might repeat a signature element of the hardware language to unify the overall look. However, it isn't always necessary to have one visual language study matched to one industrial design language study; it's possible to have just one industrial design study and multiple visual design directions, for example, particularly if most of the interaction with the device is based on the screen. However, industrial and visual designers should always develop these directions in concert, as in Figure 18.3, since software and hardware that don't share a language will never quite feel like a unified experience.



Figure 18.3. Visual and industrial designers need to collaborate on design language development.

## Determine what elements to represent

ID studies usually include most of the important visible elements of the physical product (expressed using a somewhat generic form); visual language studies typically consist of a few example elements rather than an entire screen. Using only a few or generic elements saves design time and allows broad exploration, just as temporarily ignoring constraints helps interaction designers ideate at first. The constrained representation also makes it clear to stakeholders that the focus is not on the interaction or form factor.

The elements shown in the visual design study should reflect the type of content the screen will eventually show; a study for a Web site might include a photo or two, whereas a study for an analytics application would show part of a graph or table. Visual language studies almost always include treatments of typography and common interface controls such as buttons. They might also include an icon or two, though these can be time-consuming to develop. Each study should treat exactly the same visual or physical elements, so that designers and stakeholders alike are comparing apples to apples.

Framework

## Decide what choices best represent primary attributes

Using your knowledge of principles and patterns, such as those outlined in Chapter 17, think about what colors, shapes, materials, finishes, and other elements will best represent each attribute. As shown in Figure 18.4, the more elements you use to portray a quality, the more strongly it will be emphasized. Slightly rounded corners on a software button hint at simplicity and approachability. Very rounded corners, thick outlines, and bright colors portray a degree of friendliness and simplicity appropriate only to interfaces for children. Type is seldom a big emphasis for productivity applications since so few faces hold up well in complex system designs.

The visual and industrial designers should discuss these choices together, sketching forms, surfaces, and shapes, then looking at colors, materials, and finishes. If both have the same starting point in mind, there is a greater likelihood that their initial explorations will be complementary.

### Adjust for context as needed

Next, consider whether any of these choices is inappropriate to the context of use. Thin, sharp lines incised in the handle of a plastic medical device might look precise and imply where to grip it, but are also likely to trap grime. Bright red controls could be consistent with the brand and the experience attributes, but might need to be reserved for communicating status along with yellow and green.

### Begin to render the studies

Depending on the amount of time available and the comfort level of stakeholders, an industrial design study might be a neat pencil sketch, an Illustrator or Photoshop drawing, or even a loosely rendered, three-dimensional model. A quick 3D render with a few details hand sketched on top, as in Figures 18.12 through 18.14, is a nice compromise because it shows the qualities of the materials and finishes, which are essential to the physical aspect of the design language, without requiring a tremendous investment of time. Hand sketches like the one in Figure 18.5 are the best choice for an initial review within the design team, since they take little effort, but they don't work as well with stakeholders, who are usually unaccustomed to reading sketches.

Visual design language studies are most effective rendered in pixels as a color palette and a swatch or two representing likely interface elements. A palette of typefaces is worth including if type plays a big role, such as on some Web sites. A medium to dark gray background provides a neutral backdrop for evaluating each study.
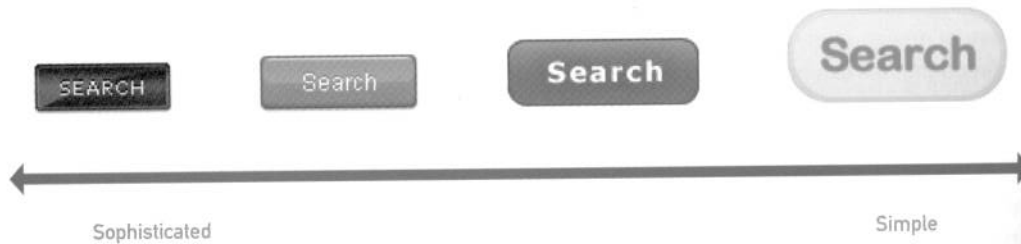


Figure 18.4. The more properties you vary, the stronger the visual message.
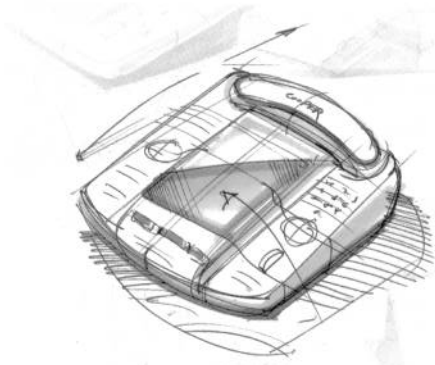
Sophisticated — Simple

Framework

Figure 18.5. Hand sketches work well as first-draft ID studies within the design team; this one is a precursor to Figure 18.14.

The visual and industrial designers are working in such different materials that, although it's important to begin sketching and discussing color and material choices in tandem to ensure a cohesive language, it's much easier to draw the studies separately at first. However, for a device in which the screen is a significant visual presence, it's difficult to make a fair assessment of the direction until stakeholders see both together, so in most cases you'll also want to apply the screen treatment to the physical product rendering using Photoshop or a similar tool.

If there's time, try to develop more than one study per attribute. You can do this by having each designer do one study for each attribute, thereby giving you at least two studies to choose from for each, or you can have each designer develop a range of options for a subset of the attributes.

## Adjust for secondary attributes as needed

Once you have a first draft of a study, pause and examine it to see if it clearly emphasizes one attribute without completely losing the others. If another attribute seems to be missing entirely, try varying just one or two visual properties—such as shape, texture, or line style—to bring in just a hint of the missing attribute, as described for Figures 18.6 through 18.9.

## Review, iterate, and finalize options to present

Once you are satisfied with your set of first-draft studies, show them to the rest of the design team to see if they agree that each attribute is well represented and to determine whether they foresee any usability or other issues with any of your choices. Iterate each study as needed. Never show stakeholders a study that anyone on the team believes is problematic unless you are explicitly using it as a negative example; Murphy's Law makes it almost inevitable that stakeholders will like it! This doesn't mean each study has to be perfect, though. As with the interaction design framework or form factor, it's fine if the design has a few problems as long as you're confident you can work them out later.

### Exercise

Create hardware and software visual language studies for the LocalGuide.

## Example: NetApp

NetApp is a leading provider of network storage and data management solutions. As the inventors of the first networked storage appliance,[1] NetApp has a reputation in the industry for providing both innovation and simplicity, which is a key competitive differentiator. A team of Cooper visual designers, led by Nate Fortin and Nick Myers, has been

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1. http://www.netapp.com/us/company/leadership/strategic-direction.html.

working with NetApp to define a visual language for its applications that conveys the following experience attributes:

— **Complexity, simplified:** Two-word experience attributes of this sort are unusual, but this tension is an essential part of the NetApp brand platform. Simplicity alone might imply *simplistic*, which would be problematic in a powerful tool.

— **Brilliant:** NetApp provides intuitive, innovative solutions. *Innovative* is not a great experience attribute because it has no particular visual qualities associated with it; *brilliant* evokes sharp contrasts and a bit of sparkle.

— **Mature:** At the same time, NetApp makes stable, high-quality products, not untested technology that's likely to fail. *Mature* exists in

tension with *brilliant*; it implies a certain quiet orderliness and perhaps a bit of conservatism in visual style.

— **Empowering:** This is another slightly unusual experience attribute; how does one depict a product as empowering? The obvious choice here would have been *powerful*, but this can be intimidating. Although they drew on visual patterns that embody power, the team chose *empowering* as a reminder that all of this power must serve the persona; ultimately, it must make *him* feel powerful.

Figure 18.6 represents *complexity, simplified*. The somber, graduated blues, which relate to the dominant identity color, are reminiscent of looking into increasingly deep water. Coupled with the small, sans-serif type and crisp, graph-paper-like

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Figure 18.6. Complexity, simplified.

Figure 18.7.

background of the chart, they visually imply the depth and precision one would expect from a powerful, complex IT tool. These qualities are balanced by the neat, plain rectangles, which are unornamented except for the slight softening of the corners, and by the touch of bright color that helps imply simplicity. The sharp, white line on the graph and the slight highlights on the colored bars add just a touch of brilliant sparkle, without being so bright as to seem immature.

Figure 18.7 emphasizes *brilliant*, which is associated with clarity, bright light, and sparkling highlights and reflections. The palette in this study uses plenty of white. Notice how the amount of white in the gradients makes some elements, such as the blue selection highlight on the right, almost luminous. The colored stripe on the selected tab at the top left has a strong highlight, making it look nearly metallic. The basically rectangular elements are softened further with greater rounding on the corners. The line on the graph is done in bright yellow to add a bit of liveliness. The graph-paper background is still there, but downplayed; along with the small type and substantial amounts of gray, it still indicates that for all its bright sparkle, this application is no simple toy.
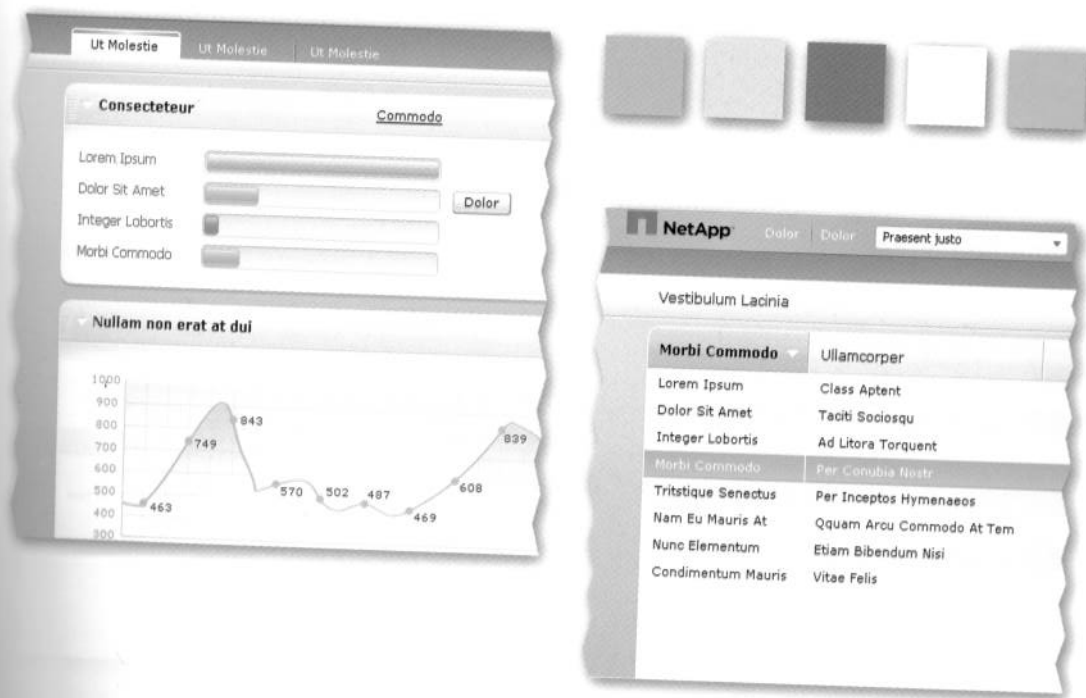
> Each study emphasizes a single experience attribute.



Figure 18.7. Brilliant.

## The secondary attributes should not be entirely absent from any study.

Figure 18.8 represents *mature*, which is associated with dark, sober, desaturated colors such as gray or navy blue. One would expect a mature professional to be crisp and decisive, hence the sharp, square corners on the elements of this study. However, maturity taken to extremes could be seen as static or rigid—one reason the designer added the angle on the tab at the upper left, which is repeated in the colored bars below it. Lest the palette become too drab, he also added a bit of bright color on the bars and in the narrow, cyan stripe near the top of the tab. After showing it to another designer, however, he realized that the bright color and was a bit much to seem entirely mature and that the color was too flat to be brilliant. The strong, purely decorative elements, such as the cyan line, also seemed at odds with simplification.

Figure 18.9 is a second, more successful take on *mature*. This version uses a slightly darker gray background. It retains the sharp corners as well as the angled elements to avoid becoming too static. Instead of the flat, saturated colors, the bars are rendered in softer, almost translucent tints with sparkling white highlights on the edges. The heavy, navy blue selection highlight is brightened so it does not conflict with the softer colors.
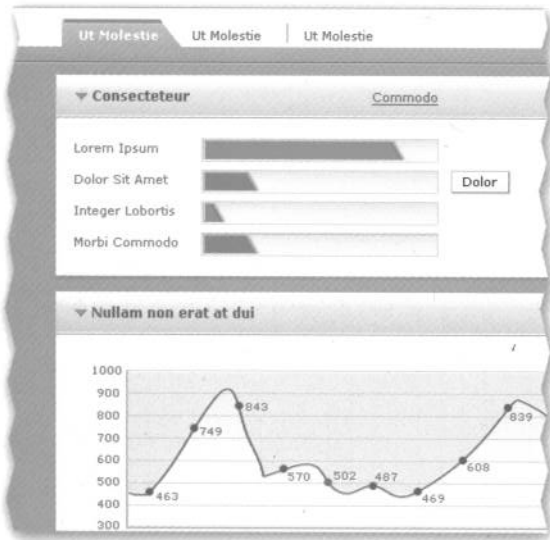
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Figure 18.8. Mature, version 1.

Figure 18.9.

Figure 18.10 is focused on *empowering*, and nothing says *power* like black and dark gray, which are plentiful in this study. It's possible to have a touch of brilliance even with all these dark shades; the subtle gradients on many elements stop just short of making them look metallic. Similarly, the tan used in the selection highlight and some text is almost (but not quite) golden. At the upper left, a set of angled black "vents" echoes the industrial design language of NetApp's powerful hardware.

The study in Figure 18.11 tries to do a little bit of each. The dark gray bar along the top implies power. The almost-sharp corners and simple rectangular elements, along with much of the color palette, imply maturity and simplicity. The highlights on the colored bars still add a touch of brilliant sparkle. However, this study expresses none of these particularly clearly. Of the set, it is the least successful at communicating the strategy—a logical choice for the team to eliminate before presenting to the client, unless they wanted to illustrate what not having an emphasis looks like.

> Studies that don't emphasize one attribute are usually less successful.



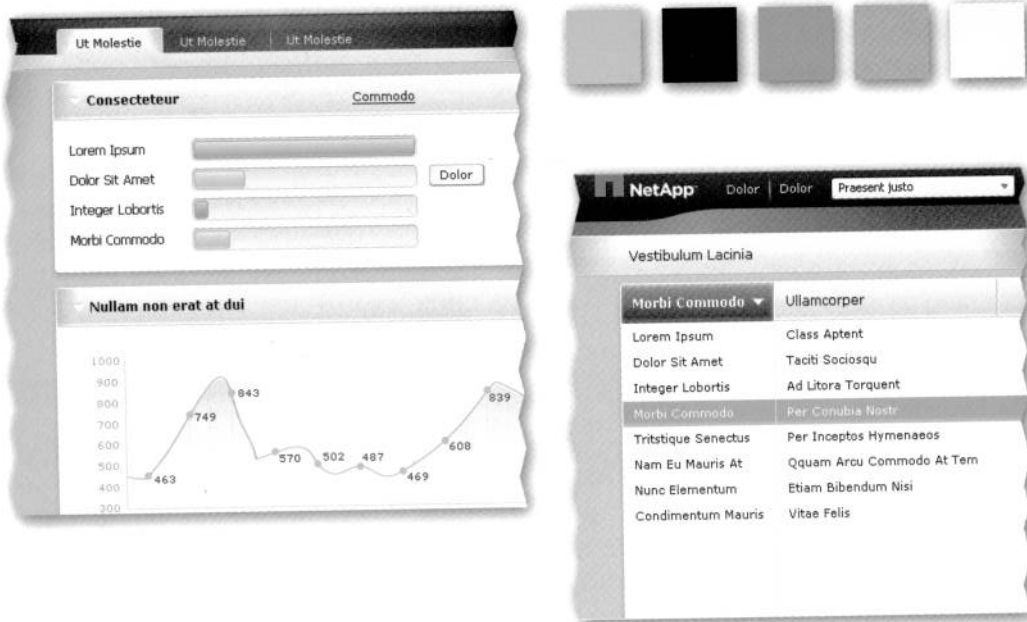Figure 18.9. Mature, version 2.

Framework

Figure 18.10. Empowering.

Figure 18.11. A little bit of each.

Framework

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## Example: Executive Telephone

The following studies by visual designer Daniel Kuo and industrial designers Michael Voege and Chris Weeldreyer are focused on a single architecture for an executive telephone that incorporates touch-screen interaction with a directory, voicemail, and call management. You saw some of the early ideation for this device in Table 16.6. These experience attributes guide the studies:

— **Exceptional:** Although it must be reasonable to build with existing technology, everything about the design has to say it's a quality product. It needs to be the sort of thing an executive would want to show off and anyone would want to use—professional, but an object of desire all the same. Related words include unique, elite, advanced, sleek, and inspired.

— **Trustworthy:** Companies expect their phone systems to be more like furniture than computers: long-lasting and reliable. Our primary persona, a project manager named Scott, would be impatient with a telephone that crashed or made him look stupid. This implies a sense of solidity and quality in fit and finish, along with straightforward visual communication. Related words include professional, efficient, and competent.

— **Approachable:** A telephone must be a simple appliance that anyone can walk up to and use the first time. Some executive phones look complex enough to control a nuclear power plant. Although this phone will rely heavily on a touch screen, it still has to look familiar, helpful, and inviting.

Let's take a look at how the hardware and software studies depict these qualities. Although stakeholders would initially see the hardware and software studies separately before seeing them integrated, they're shown together here to illustrate how the on-screen visual design relates to the hardware design.

Figure 18.12 leans toward the *exceptional* attribute. The visual designer and industrial designer both used crisp, angular lines and a strong geometric layout grid that imply a certain precision and attention to detail. The black and dark gray of the hardware and visual design are solid, businesslike colors, but with a more modern edge than reliable navy blue would have. The black implies depth and power. The on-screen gradients give certain elements a sleek, glossy finish that mirrors the smooth black surface of the phone. The bright yellowish-green selection highlights on the screen seem futuristic and high-tech; the dark, neutral palette allows the color to shine in an almost jewel-like manner.

> Stakeholders need to see how the physical and visual expressions of the design language relate to one another.

Framework

Figure 18.12. Exceptional.

The aluminum parts on the body of the phone and the handset frame the product almost as if it were a work of art. A visible groove between the front surface and the aluminum edge makes the body of the phone seem to float within its frame.

The overall effect leans a little toward being cold; if this phone were an executive assistant, it would wear a fashionably tailored suit and have every hair in place. The two rounded hardware controls and the slightly rounded corners on the tabs and action button on the screen soften the

look just a little and keep it from being entirely unapproachable.

Figure 18.13 is more *approachable*. The form is more familiar and solid. Due to its sharp contrast with the material of the phone's body, the substantial metal bezel surrounding the touch screen calls attention to the most unusual aspect of the product. The brushed aluminum material choice implies both quality and solidity through its appearance and tactile properties. The scale of this element also adds a sense of mass, reinforcing

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+ Sed quia non eius numquam

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Commodi

Figure 18.13. Approachable.

that this is a reliable device, though the slight curvature to the bezel and body of the phone, as well as the material contrast, add a dynamic quality and keep it from seeming overwhelmingly massive. The rest of the body is rendered in a dark gray matte finish on its face, which is both professional and familiar; glossy black in combination with the aluminum bezel would be too cold to promote the approachable nature of the phone.

You might imagine an approachable executive assistant as organized but cheerful, with personal touches like trinkets and photos of the kids on her desk. The rounded corners and yellow highlights in the visual design study (echoed in the voicemail indicator on the phone's body) embody that cheery friendliness. The subtly patterned green background is distinctive; it draws the eye and tempts the viewer to touch it. It's easy to imagine enhancing this effect by making the waves undulate in a barely noticeable way when the device is not in use. The controls at top and bottom unify the design language by echoing the curvature and color of the hardware bezel.

Figure 18.14 focuses on being *trustworthy*, but is also more *approachable* than the first study. The overall form of the device looks heavier than in the other two studies, both due to its form and the absence of the strongly contrasted aluminum parts, though the dark base still makes the face of the device appear to float. The lighter material and the uplifted screen promote a sense of openness. The form is simple; the integrated cradle for the handset creates a less-complex outline at the top of the phone. The overall effect says there's no hidden complexity here. The volume and voicemail-playback controls are implemented as chunky yet precise-looking knobs, which provides a greater sense of both solidity and control than the more delicate, dished controls in the other studies.



Figure 18.14. Trustworthy.

The lighter visual design palette and matte texture are businesslike yet open, likewise creating a sense that what you see is what you get. While the first study is a bit of a show-off, this one says, "I'm just sitting here waiting to do my job." The additional rounded buttons and bright yellow highlights add an air of approachability. *Exceptional* is downplayed this study; as an executive assistant, this phone would wear practical clothes and be quiet, competent, and helpful.

## Project Management for Design Language Exploration

The activities described in this chapter generally take anywhere from a few days to two weeks, though it is certainly possible to spend more time, especially for consumer products for which style is an essential selling point. One or two visual designers usually spend a couple of days on the first round of studies, with an internal review on the second day and a day or two of refinement after that. A single industrial design study can take a few days or even more, depending on the level of detail.

Interaction between the visual and industrial designers—and with the rest of the design team—is essential both before studies begin and once a first round of studies has been created, especially since the two sets of studies need to converge. Once the entire team is satisfied with the studies, they can be presented to the appropriate stakeholders, as discussed in Chapter 19.

If you are designing new hardware and have easy access to your stakeholders, you can either develop the design language using a generic volume, or have a formal meeting about the platform/architecture and interaction framework possibilities first to narrow the directions before you delve into the design language. If you must travel to present your framework and design language, though, you will probably find it more efficient to present everything at once.

## Summary

An effective design language cannot simply be a matter of taste. To ensure that the product ultimately emphasizes the qualities that are most important to the brand, you must help stakeholders assess aesthetic choices in light of how effectively they express those attributes. Rather than shooting in the dark by coming up with a range of random styles, focus your efforts on studies that emphasize one attribute at a time. Even though the final design probably won't be exactly like any of the studies, the conversation the studies stimulate will help ensure that the final design language speaks clearly and appropriately.

Framework