- *Metaphor*
- *Structure*
- *Emphasis*
- *Type & Color*
- *Complexity*
- *Language*
- *Behavior*
- *Consistency*
- *Transparency*
- *Delight*

User Interface Design Principles

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Updated 12/2008

Preface

This primer on user interface principles is based upon lectures given at San Jose State University for UI Design Fundamentals (DSID 131) and the Silicon Valley Code Camp.

Much of the content is drawn from a design guidelines document created by Andrei Herasimchuk at Involution Studios, a studio focused on the craft of interface design, where I had served as senior designer. Andrei and I first co-taught DSID 131 in Fall 2007. For my purposes, I have removed client references, and added concepts and explanations beyond the original text, per my own design approaches and experiences.

I created this as a reference for design students, other designers, and those interested in improving their digital products. I hope this proves to be useful in the broader effort to spread good design practices. Please send comments to udanium@gmail.com.

Related resources:

- *Good Design in the Digital Age by Richard Buchanan*
- *The Elements of Friendly Software Design by Paul Heckel*
- *Envisioning Information by Edward Tufte*
- *Designing Interfaces by Jenifer Tidwell*
- *Designing Visual Interfaces by Mullet & Sano*

Introduction

Compelling, attractive, intuitive digital product design is about achieving a meaningful balance – at both the organizational and product levels.

At the organizational level, it's a balance among business needs, customer desires, and technology constraints. At the product level, it's a balance among presentation, functionality, and utility. Balance involves enabling a situation where none of the elements overwhelms the other, creating disharmonies and imbalance.

The process of evaluating and iterating a product is thus an exercise in understanding and identifying these elements and then applying the fundamental principles of good design. These principles are intended to provide insight into best UI and interaction design practices, with brief yet clear explanations and examples.

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1 Metaphor

A metaphor visually personifies the interactive qualities of a digital product, mapped to some familiar pre-existing concept. In short, metaphors help a "newbie" quickly get the purpose and utility of an unknown. They guide and teach a user about what the unknown can or cannot do. Metaphors are inherently incomplete. They enable a necessary, yet sufficient level of understanding to understand a concept, making it just meaningful enough to act on it given a certain context and task goal. No metaphor is 100% accurate, but some metaphors are better than others.

In tandem, a mental model is an abstraction of the metaphor, based upon a deep understanding of the product's purpose. It is also based upon how a person views the world: cultural values, personal attitudes, social assumptions, and past experiences. Mental models frame the product in the user's mind.

- *A mental model informs the initial and ongoing interface design, serving as a baseline for all eventual design decisions. It is key to user understanding and fundamental to the design road map.*
- *Establishing the proper metaphor and mental model is fundamental to driving the design process.*
- *Simplicity is the hallmark of a strong mental model: users should intuitively understand the model they are presented, as a visually expressive metaphor.*

2 Structure

A well-designed digital product must be grounded on a foundation of good structure. This means navigational structure for a memorable, meaningful path throughout (taskflow), informational structure for sensible grouping of content and actions (menus and tabs), and visual structure for attractive yet rational organization of a screen's content (layout).

Visual structure implies hierarchy and order of content, to guide the user's eye accordingly towards what is relevant. Thus, the structure is based on a well-defined grid. Grids provide order, regularity, rhythm, and control. Knowing how to work with grids is a vital interface design skill, which takes years to master.

Having a good grid yields good wireframes – the building blocks of a strong interface and product overall. Wireframes are the high-level blueprint for the product, much like an architect setting the structure before starting construction.

- *Wireframes are based on real ratios; if type is used inside wireframes, it also must respect the ratio.*
- *Wireframes must follow a well-defined grid.*
- *If the wireframe is overly complex at a visual level, the product will naturally become too difficult to construct or design.*
- *The goal of the wireframe is to create a foundation for the layout of the application, not serve as a low level detail design specification.*

3 Emphasis

To effectively showcase and prioritize specific pieces of information or controls, proper emphasis must be used. If every item on a screen is promoted as the most important thing, the overall effect is nullifying, or worse, reduces the information display to a muddy mush – difficult to parse quickly and making the user feel confused or frustrated, forcing her to think about your design's intent.

Clear, proper, effective emphasis occurs through good contrast. And a well-defined sense of what is truly important for a user's goal. You must constantly question and ask yourself just how important one feature or content item is in comparison to every other feature in the design of any product.

- *There should always be a single focus on the screen acting as a visual anchor, even if that point is not the primary concern of the user.*
- *Create boundaries and scope. Limit emphasized options or controls up to three and no more than five.*
- *Contrast means using effects like "bold" and colors and icons judiciously.*
- *Whitespace is a key element for manipulation when trying to emphasize something on-screen, giving space to let the content "breathe" and fill out the space naturally.*
- *Crowding a screen with every possible piece of data only creates confusion, hurting the contrast and priority of content.*

4 Type & Color

Most design problems are simply type issues. As a good rule, start your design with three fonts, where a font is any variation of the typeface, size, weight, style, color, etc. For example, 11pt. Helvetica #333 and 11pt. Helvetica Italic #333 are considered two different fonts. Each variation is a visual signal that "speaks" and must be processed by the user. Too many signals, confusion results, thus hurting your design's usefulness. Only once you have type under control should you pick the optimal spots to break this rule.

Color follows the same constraints as type, with the exception that color gets to the core emotional impact of the product in a more direct, visceral way that type does not. Where type speaks, color punctuates. Where type provides communication, color provides context. Just like it's typographical counterpart, a color palette must be applied judiciously, carefully avoiding extraneous or random additions.

- *Words are the functional equivalent of icons. When you read a body of text, you are not parsing individual letters. You are actually seeing a small symbol that is parsed as a single object.*
- *When type is set with excessive unevenness, it's the equivalent of stuttering. So when in doubt, follow the rule of limiting yourself to no more than three fonts.*
- *Define a product color palette. Pick a color system that serves the needs of a software product at a functional level.*
- *A good place to start is to pick a base color, up to three compliments, one highlight color and a defined level of black and white.*

5 Complexity

Excessive line noise, ornamentation and lack of white space often prevent the product's controls from fulfilling their purpose. A well-designed interface respects the user's goals and minimizes the amount of stuff in the user's way. Interface noise is everything that gets in the way of the interface fulfilling its reason for being.

Products that suffer from complex interfaces often will find at the root of the problem a large amount of extraneous redundancy. A significant amount of complexity can be removed from the product through the simple task of flattening.

Remember: every additional control, icon, text, tab, menu item and so forth, is another visual & cognitive signal that the user must process and learn, exponentially increasing the choices to be evaluated, even if it is a for a split second.

- *Always question, "what is the user trying to do here?" and measure the interface against that task.*
- *Visual: Remove all extraneous line noise and ornamentation. First achieve visual simplicity before decorating with flourishes.*
- *Information: Always check the screen for words and symbols that have been repeated in proximity of each other. Then consolidate.*
- *Behavioral: Pick a primary method for performing an action and feature it prominently. Controls and interactions that duplicate the behavior be hidden one level deeper.*

6 Language

Many design problems that adversely impact usability are really just issues of poor terminology: button labels, menu items, feature names, content areas, and so forth. Generally speaking, product terminology should be no more complicated than common language in everyday conversation. Create terms without any attempt at cleverness, complex word construction or by combining too many words into a single term that would prompt the use of a dictionary. Just call things what they are. Avoid unfamiliar marketing speak or fancy jargon to "sound cool".

Also, establishing consistency of lingo is vital towards more efficient, clear communication with minimal confusion downstream at spec'ing and QA'ing stages of product development.

- *Avoid marketing labels in the interface; call things what they are at the mundane object level.*
- *Always use industry standard language when possible for specific domains, such as financial services or biotech software, for example.*
- *If you can't answer the question, "what is this" in a single sentence with regard to a term in the interface, it is likely you have misused the term.*

7

Behavior

A digital product is used to do something. Interactive behavior, and specifically, the ability to directly manipulate data with the mouse as an intuitive seamless extension of the user's hand/mind, are critical that regard.

Most of the things people want to do with software require direct manipulation: selecting and moving an object, tagging or otherwise identifying an object, creating relationships between various objects: these very simple tasks that are common to many software products ultimately determine whether the product is useful or not. Therefore, it is important that ample design time and thought go into the process of how people complete direct manipulation operations.

A user's assessment of how usable a software product is typically is a direct response to this obvious fact.

- *If the interface lags in response to the user's action, then no matter how good the product's feature set may be, it will always be perceived by the general user in a negative light. Performance matters to good design!*
- *Obviousness is not the most important aspect of product behavior; short learning curves and usefulness over the long term is.*
- *All interactive behaviors require feedback, even in cases when that feedback is an explanation of an error.*

8 Consistency

To help ensure a more usable product overall, consistent use of colors, typography, labels, behaviors, and iconography is necessary. This creates predictability and thus familiarity for the user, particularly across functional areas or modules or suites. A user avoids having to re-learn a new model or approach, thus maximizing satisfaction and productivity.

However, blindly following consistent patterns and style guides can be harmful without regards to the specific screen context, goal or task to be performed. Just like good use of grids, type, and color, there are moments of judicious breaking of consistency in support of higher priority goals.

- *Forcing consistency for the sake of consistency isn't the best prescription if it conflicts with the needs of a certain context/situation.*

9 Transparency

The best product interface is the one that the user doesn't even notice. Why? Because the user is too busy using the product to do something: writing a paper, playing music, purchasing a book, sending a message, creating a photo. In the end, ordinary people use digital products not for its "snazzy interface" but to accomplish a goal, with a fulfilling sense of satisfaction.

If the interface is done well, the choreography of colors, type, structure, icons, behavior, navigation should map to user's expectations and thus feel quite natural and intuitive, as a natural extension of the user's abilities. The interface just "feels right" letting the user do what she wants to do. It's almost magical!

- *Transparency does not mean being obvious but instead, being naturally sensible, speaking to the user's abilities and expectations given the task, context, and goal.*

- *The user focuses on her activity at hand, with the interface supporting her accordingly.*

10 Delight

There are moments when a product does something quite unexpected, beyond ordinary assumptions, and the user is pleasantly surprised, even delighted. These are features that may not be obvious in the interface, but when discovered, prompts gratitude and wonderment. That "aha!" moment makes the product even more endearing and valuable, enhancing its stature in the user's mind.

Delight is a positive goal for designers to strive for, outside typical usability needs. It's the " x factor" that makes a product truly desirable, winning hearts and minds and extending the brand promise.

- *Seek out opportunities to do something positive, surprising, and delightful to make your product desirable.*
- *Clever use of wit in the text, animations, sounds, graphics are all moments for delight.*
- *However, like a comedian failing at a bad joke, pursuing delightful surprise is a high risk yet high reward proposition. Tread carefully! Poor execution can annoy users, making them view your product in a negative light.*

Trust + Desire + Integrity

In the end, a carefully balanced choreography of these principles in the product's interface will result in a rewarding, memorable user experience.

More specifically, there is a high degree of trust instilled in the product, a feeling of desire towards to product to want to use it again (and share with others), and a profound intangible sense of design integrity or harmony.

As designers armed with empathy and vision, it is our duty to create products that not only support the business goals, but the human goals of making something that respects the user's needs and lifts their aspirations.

- *Trust implies confidence and reliability.*
- *Desire conveys strong emotional connection, fulfilling hopes and dreams.*
- *Integrity is about being authentic and wholly formed, cohesive and balanced.*