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"In writing Thoughts on Interaction Design, Jon's reflective, learned, and articulate exploration has simultaneously provided an entire profession with a rallying point, a claim to credibility, and a vision. When we look back on the formative years of Interaction Design as a distinct endeavor, this book will surely be recognized as the seminal work."

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-DAVID CRONIN,
MANAGING DIRECTOR,
INTERACTION DESIGN
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"Jon Kolko moves Interaction Design to a new level of analysis with this powerful, thoughtful book. Kolko demonstrates that interaction design impacts all aspects of our lives. That the tools and methods can be used for the solution of social and political issues and not simply for the development of products. This book is essential reading for all who wish to move beyond style to deep, impactful substance."

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OF LIVING WITH
COMPLEXITY

"This is a necessary updating of Jon Kolko's original work; retaining the clarity and accessibility of the first edition but pushing into more areas, as the practices (and the concerns) of interaction design/designers have expanded broadly in the past few years. Jon has the heart of a thought leader and the soul of a teacher, and he offers up a healthy amount of both in this book."

-STEVE PORTIGAL, PRINCIPAL, PORTIGAL CONSULTING "The second edition of Kolko's Thoughts on Interaction Design is an important book for the discipline of interaction design. It artfully weaves together the practice of interaction design with contemporary design theory and research in a thoughtful and reflective manner. The result is a text that is immensely valuable for both senior and novice interaction designers."

-CARL DISALVO, PHD.
GEORGIA INSTITUTE
OF TECHNOLOGY

A collection of reflections written by Jon Kolko

## THOUGHTS

NTERACTION DESIGN

SECOND EDITION



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Morgan Kaufmann Publishers is an imprint of Elsevier



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Morgan Kaufmann is an imprint of Elsevier 30 Corporate Drive, Suite 400, Burlington, MA 01803, USA

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Library of Congress Cataloging-in-Publication Data

Kolko, Jon.

Thoughts on interaction design : a collection of reflections / written and compiled by Jon Kolko

p. cm.

ISBN 978-0-12-380930-8

- 1. Industrial design--Psychological aspects. 2. Product design. 3. Human-machine systems.
- 4. Human-computer interaction. 5. Engineering design.

TS171.4.K65 2011

745.2--dc22

2010034708

British Library Cataloguing-in-Publication Data A catalogue record for this book is available from the British Library.

ISBN: 978-0-12-380930-8

Printed in Canada

11 12 13 14 15 10 9 8 7 6 5 4 3 2 1

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For information on all MK publications visit our website at www.mkp.com



### BAHGAWK!

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#### INTRODUCTION

This text contemplates and contributes to the theory of Interaction Design. There exist a number of texts that have already explored Interaction Design. Some of these consider the role of design in Human-Computer Interaction, a field bounded by Cognitive Psychology and Computer Science. These texts usually describe the nature of design as related to a user interface design on a screen—emphasizing the specific elements that show up in an interface or examining examples of best practices, heuristics, or guidelines for creating interfaces. This type of text is frequently found in schools of computer science and may actually be used as a textbook for engineering students interested in understanding the human-level repercussions of their actions.

Other texts explore the nature of design as related to the creation of two-, three-, or four- dimensional forms. These texts look at aesthetic and emotional value provided by various shapes, compositions, or arrangements of elements. The mechanism for explaining formal choices is usually by example—showing a physical product or demonstrating a particular interactive piece—illustrating the result of design work in a graphical way that emphasizes beauty and elegance. This type of text is often found in schools of design or fine arts and may be used to illustrate a historical precedence for a particular stylistic movement.

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There are, however, few texts that explore the semantic connections that live between technology and form that are brought to life when someone uses a product. These connections may be thought of as interactions—interactions that, in aggregate, make up behavior—and are beginning to hint that a field known as *design* is a legitimately separate area of study alongside science or art. This text describes Interaction Design and considers and reflects on the more theoretical and conceptual aspects of the discipline.

I'm fully aware that practicing Interaction Designers may find the contents of this text to be high level, academic, or seemingly void of pragmatic or immediately applicable use. This book will not provide immediate things one can do in the context of his or her job, and the book does not describe methods to use, ways to financially rationalize your work, or ways to code interactive simulations. Other books do this quite well.

Instead, it is my primary goal to better explain what
Interaction Design is and why it is important: to provide a
definition that encompasses the intellectual facets of the
field, the conceptual underpinnings of Interaction Design as
a legitimate human-centered discipline, and the particular
methods used by practitioners in their day-to-day experiences.

A second goal is to provide Interaction Designers with the vocabulary necessary to intellectualize their work and communicate it to others: to other disciplines, to the popular media, to politicians, and ultimately, to decision makers. Without this justification, our advocations for the humane manifestation of technology may fall on deaf ears in the face of technological advancement.

A final goal is to highlight the potential for Interaction
Design to exist outside of the confines of business and to assure
fellow Interaction Designers that our work is instrumental in
shaping and refining culture—and is as instrumental as other
intellectually robust fields, like medicine, policy, or law. We
need to possess a great intellectual capacity for complicated
problem solving, for dynamic inquiry relating to technology,
and for substantial empathy of the human experience. This
intellectual insight is ideal for solving the difficult societal
problems plaguing humanity and for humanizing technology,
and the creation of pretty interfaces is perhaps the most blatant
(and unfortunately prevalent) misuse of this critical resource.

Designers of all breeds bemoan their lack of representation in industry—we claim to be misunderstood, underpaid, and relegated to stylist or pixel pusher. If we are, in fact, stylists, then we deserve to be paid to style: to create a temporary visual feeling that is transient and cheap. But Interaction Design is not about a fleeting aesthetic. A cool Flash interface defines Interaction Design in the same way that accounting defines strategic business development—not at all. Interaction Designers are trained to observe humanity and to balance complicated ideas and are used to thinking in opposites: large and small, conceptual and pragmatic, human and technical. We are the shapers of behavior. Behavior is a large idea and may, at first blush, seem too large to warrant a single profession. But a profession has emerged nonetheless. As applied in business, the professional category includes the complexity of information architecture, the anthropological desire to understand humanity, the altruistic nature of usability engineering, and the creation of dialogue.

While there is now a need for this profession in business—perhaps to truly drive business—the value of Interaction Design is not in the creation of profits; these are incidental. The value is, instead, in the development of human-centered designs that better daily life for people and in the creation of a societal framework in which to experience these designs.

ANYBODY GOT ANY LIPSTICK?

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## THE

#### OVERVIEW

## MEAT

Interaction Design is the creation of a dialogue between a person and a product, service, or system. This dialogue is usually nearly invisible and found in the minutiae of daily life—the way someone may hold his knife and fork while cutting into a steak or the way another person may automatically switch windows to check her Facebook wall every few minutes or so. Structuring this form of ethereal dialogue is difficult, as it occurs in a fourth dimension—over time. To design for behavior requires an understanding of the fluidity of natural dialogue, which is both reactionary and anticipatory at the same time. Common metrics for evaluating Interaction Design track the ease of use one has with negotiating an interface, yet usability is only a portion of a larger set of characteristics that become relevant during this dialogue. Objects, services, and systems that are commercially successful frequently have qualities other than ease of use that cause them to become timeless, or priceless, or desirable.

These other qualities are subjective, and design has often been described as an applied art. Yet there is a subtle distinction between artist and designer. An artist makes a statement, a distinct argument, through his canvas or clay or metal, and the viewer responds. A conversation evolves, through acceptance, or rejection, or understanding, or bewilderment. The artist rarely claims a responsibility to the audience—many artists create because they like to or because they feel that they have to—and clarity of message may be less relevant than a strong emotional reaction. "I do not understand your message, yet I understand that I do not like it." The audience is able to form opinions and actions without becoming intimate with the content.

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A designer has a harder task. Design work is of function, and language, and meaning. Through visual and semantic language, a designer must create a design that assists the viewer not only in experiencing a particular emotion but also in truly understanding the content. This understanding is deeply culture specific and is not isolated in a single instance in time. The audience must actually realize the intentions of the designer and embrace the culture of the language that is presented. The designer does not design as language is spoken. Instead, design is a form of language: the linguistic quality of form and content is indicated through context and use. The poet selects a topic and paints a vivid understanding of scene through character, time, and the beauty of the language. In a similar fashion, the product designer envisions an object and forms a vivid understanding of context through shape, weight, color, and material.

Interaction Designers, however, speak both words and form at once. They structure a compelling argument and invite the audience to share in the creation of a dialogue. The work evolves over time, and the work is completed by the presence and synthesis of the audience. User-centered design, as frequently practiced, often does not truly give credence to the importance of the user. The creation lies dormant until the user completely understands the intellectual depth and completely feels the emotional qualities of what has been designed. If the user never understands or feels, then the creation is never actually usable. This is not a noble and altruistic profession through intention, but rather through need.

#### Understanding the role of technology

Much praise has been written about the design of consumer electronics. Apple has been heralded by both business magazines and consumer reviews as the leader in innovation and authority on design; each new Nokia phone or Playstation release is announced as a huge leap forward in innovation. Yet these products—seemingly the best of the best—only hint at the capabilities of technology, if applied in a humanistic and aesthetically relevant manner. For at the end of the day, the music player is still a brick (albeit a much lighter brick than was previously available), and cell phones are still hard to use, and video games—while realistic—still follow the simple kill-it-if-it-moves gaming storylines of the early 1990s. These designs are not timeless, and they are not elegant. It is not a surprise that consumer electronics quickly end up in landfills, as there is no reason to keep them for any extended period of time.

Technology now affords a dramatic set of positive outcomes for humanity—massive social change, positively brilliant entertainment, and a more compelling understanding of self. The appropriate manifestation and use of technological advancements can bring about powerful change with regard to the mind, body, and soul. These benefits are made possible by advances in engineering, yet they will not be found by engineering advances alone. Nor will the benefits be realized by the business-savvy executives, as the problems are human problems first and business problems second. Instead, the changes will be realized by designers, and by a specific breed of designers: those creative

designers who are both artists and engineers and who are able to balance, over an extended period of time, technology and aesthetics without ever losing sight of the most important facet of design: humanity.

#### Interaction Design as a professional discipline

Interaction Design is recognized as a new field, but people have been designing interactions for centuries. The field has deeply embedded roots in various existing disciplines. The subject frequently gets confused with some of these other fields, many of which share common names, acronyms, or techniques.

Interaction Design isn't necessarily the creation of websites or applications. It isn't necessarily multimedia design or graphical user interface (GUI) design, and it doesn't even have to have a primary focus on advanced technology, although technology of some kind usually plays a significant role. A more appropriate, albeit academic, definition of the field better reflects the working practitioner as well as predicts the future of this exciting profession: Interaction Design is the creation of a dialogue between a person and a product, system, or service. This dialogue is both physical and emotional in nature and is manifested in the interplay between form, function, and technology as experienced over time.

A simpler way of thinking about Interaction Designers is that they are *the shapers of behavior*. Interaction Designers, whether practicing as Usability Engineers, Visual Interface Designers, or Information Architects, all attempt to understand and alter the things people do, the way they feel, and the things they think. It sounds manipulative—and it is. And because the manipulation of behavior is so tightly related to power, politics, and control, it's critical to reflect on the values that are being prescribed through our creations and to think carefully about the work we do.

The field of Interaction Design has been acknowledged as a structured and unique discipline only in the past 20 years, generally in keeping with the pervasiveness and nature of technological change. As communication and computing technology has increased in speed, function, and capability and decreased in size and cost, more and more consumer products can be found to contain some form of digitization. While this digital component frequently increases the overall utility of the product, it also serves to increase the complexity of the user experience. Thus, Interaction Designers find themselves performing usability evaluations on what were traditionally simple products, often in an attempt to ease the suffering of their end user. While Interaction Designers often work for the most financially motivated corporations, they frequently become the single champion for the consumer and spend a majority of their time trying to understand and model the user's goals as related to the business or technical goals.

Interaction Design borrows heavily from the field of cognitive psychology with regard to cognition, memory, and perception. It also draws equally from the world of art as it encompasses aesthetics and emotion. Successful Interaction Design influences a user on an emotional and highly personal level. In the same way that a painting can be challenging, a product can also evoke feelings and communicate meaning.

Interaction Design frequently gets confused with the design of websites or software, because people interact with websites and software and because digital development teams find value

in having Interaction Designers working with them. Interaction Design also gets mislabeled by business owners as multimedia or interactive design. While designers of interactive media certainly should be skilled in the techniques and methods described in this text, interactive media is almost always technologically centered rather than human centered. The majority of professional multimedia development is constrained to a specific software package and the capabilities associated with that, rather than centered on the constraints of an end user. For example, a recent job posting for a "Manager, Interactive Creative" position requires "Adobe Photoshop, Adobe ImageReady, Adobe Illustrator, Flash, HTML, DHTML. Ability to learn and adapt to new technologies and software. Familiar with Macromedia Dreamweaver, Flash, and other similar programs. Understand and stay current with the capabilities of Internet-related technologies like: style-sheets, dynamic HTML, server-side programming, Jquery, Javascript, and Java." These are technologies, and while the person who ends up filling this position most likely understands the value of human-centered design, the job description implies a company culture that is strongly computing centered. This tool-centeredness seems to indicate that a Design problem can be fixed by simply providing the right set of skills. In fact, the process of Design requires a rigorous methodology combined with a broad set of skills and a tremendous amount of passion.

#### Designing and shaping behavior

Interaction Design is complicated. It is closely related to a number of important disciplines like interactive design, product development, and marketing, and it encompasses many of these other fields. But the approach in the following pages attempts to reposition the field of Interaction Design away from a solely technical field or an artistic endeavor and instead toward a duality that emphasizes the human side of technology. An Interaction Designer must become an expert in how human beings relate to each other, and to the world, and to the changing nature of technology and business. This understanding of behavior is important now in a usability sense, as technology has afforded the creation of massively complicated systems and services that people have a hard time comprehending. The understanding of behavior becomes more important—and hopefully a great deal more fun—when the potential of Interaction Design is realized: when Interaction Designers stop being advocates for simply usable designs and begin to herald the creation of more poetic, culturally rich design solutions.

Creations that transcend usability are those that resonate deeply and profoundly and are those that make people feel passionately. A product has attributes that are distinguishing characteristics, and these characteristics make us feel a certain way. The object becomes a vehicle for the designer to speak with a viewer, much like a painter uses a canvas to communicate with an audience.

One of the main distinctions between art and design, however, may be the bidirectional nature of the communication. Interaction Design is a dialogue. A designer speaks, and the user speaks back. Over time, the communication becomes involved. This may occur as a product becomes older and worn or as a user becomes older and worn. Users change their innate responses to the object based on past experiences, perhaps through rote memorization or perhaps through a more associative integration of product into lifestyle. The ultimate goal of design, then, is to have a subtle, lasting, and intuitive dialogue with a person, the same sort of dialogue a married couple may share after years together—the type of dialogue that occurs at a glance and often without a great deal of rational introspection. Implicit dialogue means an internal monologue that is communicated through action. As we learn to intuitively use a product, we illustrate the scope of our past experiences with that product. This is in direct opposition to experience design. While we can mold activity through brute force or trial and error, Designers cannot create experiences with any degree of continuity. Instead, Interaction Designers exist to support experiences through the continual dialogue between people and products.

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### CHAPTER ONE: THINKING ABOUT PEOPLE

Interaction Design is a creative process focused on people. A number of well-known designers and academics have examined the commonalities across design processes as applied by various consultancies and have unrolled a distinct set of patterns that illustrate the movement of a design from conception through creation. These patterns explain the discrete steps that are taken when developing a cohesive Interaction Design solution. It is important to emphasize, however, that these steps are rarely delineated as carefully as they are described below. Instead, a designer works in a certain haze or fog—both lost within the trees but always aware, on some unconscious level, of the forest.



#### The process of design

John Zimmerman, Shelley Evenson, and Jodi Forlizzi, of the School of Design at Carnegie Mellon University, have presented a formal framework for discovering and extracting knowledge during the design process. This framework includes six core components, each building on the previous and each requiring a unique set of skills and tools. These components are named Define, Discover, Synthesize, Construct, Refine, and Reflect. It's important to realize that the framework serves to paint a reductive picture of "what generally happens"—but the realities of design in business are rarely, if ever, as clearly delineated as the process described below.

#### Defining the design problem or opportunity

Definition occurs in an effort to understand the problem space. Rarely are designers given a blank slate upon which to create; instead, designers commonly inherit projects that are already under way or that have an existing history. For example, a designer may be explicitly given the task of redesigning the interface of a printer to make it easier to use or to take into account new functionality that has been developed. At this phase in the process, a designer's role is one of skeptical visionary—he is able to "feel" the outcome of the project yet is often unsure of what exactly needs to be done. To objectify this feeling, a designer may explicitly list questions relating to the task: Does the navigation need to be redesigned? Is the new functionality useful? Who are the stakeholders in the project? What types of projects has this team worked on in the past? Which projects succeeded? Which failed? The designer attempts to understand wants and needs and to balance political requirements with implied end user demands and business goals. The process of human-centered design relies heavily on modeling the behavior of target users in an effort to understand what people might, would, or should do with a new design. A model is a representation of a real thing, and a model of user behavior is a representation of the actions a person might perform and emotions a person might feel over time.

One of the simplest yet most powerful tools available to Interaction Designers is the written word. Language affords a host of capabilities, including the act of persuasion and rich description. When used to organize information, the written word can create narratives that explain the proper and expected utility of a system. A good model of human behavior is rich

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<sup>1</sup> Zimmerman, John, Forlizzi, Jodi, and Evenson, Shelley. "Taxonomy for Extracting Design Knowledge from Research Conducted During Design Cases." Originally published in Futureground 04 (Conference of the Design Research Society) Proceedings, Melbourne, Australia, November 2004, available as CD-ROM.

<sup>2</sup> Ibid. It is interesting to note the commonalities of word choice in defining design process. The six components described by the CMU researchers are highly similar in nature to IDEO's four-step process (Observation, Brainstorming, Prototyping, Implementation), Design Edge's three-step process (Define, Discover, Develop), or Smart Design's three steps (Conceive, Create, Complete). This may indicate the propensity for designers to try to define what they do—which implies that what it is they do is, actually, quite messy and difficult to define at all.

with detail and is thus predictable in the same way that one can predict the actions of a friend or loved one. While these predictions may not be right all of the time, it is possible to anticipate with some degree of accuracy what an individual will do in a given situation. The accuracy improves over time—a long-term relationship provides intimate insight into how people approach problems or situations. The same is true for these behavioral models. By "living" with these models, designers can begin to predict what these hypothetical people will do in novel situations. These predictions can be used prior to a system ever existing and can be used to create visionary and compelling rationales for new ideas. They can also be used to assist in understanding and revising existing systems; to structure scenarios of use that articulate ideal goals, tasks, and actions; and to understand actions that might occur in less ideal situations.

Engineers have formalized these scenarios and often refer to them as use cases in an effort to relate these written descriptions to test cases (systematic bug testing to ensure a piece of code is operating correctly). A modeling language (UML) has emerged to help visualize these use cases in a diagrammatic format. Yet the formality of these methods is a peculiarity that is useful but not necessary. A written scenario can also be thought of as a narrative essay, as it provides narration through a particular situation. It is, however, most usefully thought of as a story of a person using a product to achieve a goal. This presupposes that the product exists (it usually doesn't) and implies that the design team understands a great deal about what the audience will want to do and what they are likely to do. It also assumes, in many cases, that people will act rationally to achieve a result—as if they can selectively ignore their emotional drives and impulses or block out the distractions of real life.

#### Project process by phase

#### define

- · team building
- technical assessment
- hypothesize

#### discover

- contexts
- benchmarking
- user needs
  - - personas
- frameworks

synthesize

process maps

opportunity map

scenarios

- · features and functions
  - behavior
  - design language

construct

- · interactions and flow models
- · collaborative design

#### refine

- evaluation
- scoping interaction
- specification

#### reflect

- · post mortem
- opportunity map
- benchmarking
- market acceptance

#### Research knowledge production by phase

- prototypical user model
- · prototypical user needs
- · client's needs
- · user mental models
- · user process models · user's relation to context
- summary of current products meeting needs (lite review)
- relationship needs of users, client, and
- context
- identify gaps (opportunities for new product or service)
- · examples of process and flow models that users will and will not accept
- · insights into high level guidelines for interaction
- · evaluation of widget performance and its relationship to software reuse
- · improved interaction flow models

- opportunites for improving design process
- · acceptance of design in the market place
- new assessment of gaps (opportunities for new products and services)

THE DESIGN PROCESS, BY ZIMMERMAN, EVENSON, AND FORLIZZI

The use of scenario-based product development has several core benefits. Narrative allows designers to contemplate the more human side of their creations—rather than focusing on technology, narrative shifts the emphasis to one of creative learning, problem solving, or attaining a goal. As behavior exists in the fourth dimension, these scenarios become sketches of time. Industrial Designers and Graphic Designers can quickly explain the value of visual sketching in their design process: Sketching is a problem-solving tool, used not simply to visualize ideas but to actually discover and generate a large number of solutions to a problem.

In the same way, the act of building a scenario is useful as a generative tool for discovering new ideas. The scenario, quite simply, becomes an Interaction Designer's napkin sketch. In the same way that a drawing has specific attributes that contribute to its success (perspective, line weight, tone, content), a scenario too has several critical components that aid in comprehension.

First, a scenario needs to include a product and a person. In the early stages of Interaction Design development, the product may not actually exist yet. The scenario development is also a form of product development. The product may be thought of as an ambiguous shape or a piece of information space; it need not be concrete.

Next, a compelling story is created that includes precise detail, sensory awareness, and vivid descriptors. Precision implies an exacting, accurate, and well-defined point of view. When combined with detail, the audience receives a comprehensive and thorough verbal discussion. Sensory awareness adds issues of sight, sound, and touch; paints an image of a smell; and may include (in rare cases) issues of taste. Vivid descriptors create colorful and dramatic emotional responses. The elements present in a story include a plot, characters, a setting, a climax, and an ending. These are also the major elements in a movie or in a television show that create the general formulaic essence of storytelling. Finally, the guiding principles of a compelling story include a point of view and the overarching goal of the story.

Explaining to your boss that you are going to require several weeks to write stories is a hard sell. Interaction Designers have developed various formalities associated with scenario writing in order to emphasize the business relevance of their creations. These may include matrices with formal variables described (including Actors, Goals, Tasks, Benefits, and Supporting Functions)

or more formal step-by-step breakdowns of tasks into task flow charts. The essence of these creations is, however, the same: to humanize a situation and illustrate a cohesive vision of product use over time.



#### Discovering hidden wants, needs, and desires

After better defining the project scope and goals, designers attempt to gather data relating to the given problem. The next step in the design process, Discovery, is often lacking in many corporations and consultancies due to tight budgets and poor understanding of the value presented by this phase. Discovery involves understanding wants and needs and accumulating artifacts related to the defined opportunity. Traditional approaches to product or graphic design emphasize aesthetic qualities related to craft, beauty, and form. The solution to a problem of design is based on emotional value, and the judgment—or critique—is often grounded in the field of fine art. Interaction Design, however, shifts the focus from the visual to the human. A design solution is judged based on the relevance to the individual who ultimately must use the creation. Central to understanding this principle is embracing a very simple idea, but an idea that dramatically refocuses the locus of attention during the act of creation. This idea is that The User Is Not Like Me.3

When embraced by designers, this core philosophy implies that consumers are unique and that all members of the product development team hold a bias in the form of an expert blind spot. The more one knows about a topic, the more one forgets what it is like not to know. Expertise makes it nearly impossible to remember what it is like to be a novice.

3 I credit Professor Bonnie John of Carnegie Mellon University as developing this subtle mantra. While others have certainly realized that they are designing for someone unlike them, Professor John engrained this phrase in the heads of students in the Human Computer Interaction Institute, creating several genera-

tions of designers and engineers who truly believe in user-centered design.

To illustrate this point, consider an example. You are employed by a telecommunications company in Europe that wants to extend their products—both hardware and services—into the African continent in order to reap the benefits of developing countries filled with potential consumers. You have a suite of mobile products already designed for the United Kingdom, including games, applications for finding retail establishments, and different ways to record videos and share them with friends; it seems fairly trivial to convert the interfaces to other languages and then begin to offer these in Africa.

Now consider some of the nuances of Africa—not the least of which is the 2000 individual languages spoken throughout the various countries. Consider that of the billion people on the continent, less than 60% of them are literate. The majority has access to a mobile device, but in many countries, the device is shared among a group or even the entire village. Some areas enjoy full service coverage, but remote regions may have as low as 42% service availability. And consider that even with these challenges, many of the southern countries—like South Africa—have fully embraced the phone as a medium for payment, photography, and even health care.

The User Is Not Like Me, and the people that will be using your products have fundamentally different perceptions, cultural norms, and cognitive models on which they draw when using things like new phone services and products. To simply convert an

<sup>4</sup> International Literacy Day, September 7, 2001. <a href="http://www.sil.org/literacy/litfacts.htm">http://www.sil.org/literacy/litfacts.htm</a>

<sup>5</sup> Smith, David. Africa calling: mobile phone usage sees record rise after huge investment. In Guardian, October 22, 2009. <a href="http://www.guardian.co.uk/technology/2009/oct/22/africa-mobile-phones-usage-rise">http://www.guardian.co.uk/technology/2009/oct/22/africa-mobile-phones-usage-rise</a>

existing product into a new language (often called *localization*) without considering fundamental changes to features, capabilities, and behavior ignores the rich cultural differences of the end users—and almost guarantees failure. In order to understand that The User Is Not Like Me, Interaction Designers practice a form of user research that draws heavily on the fields of Anthropology and the other social sciences, yet encourages and emphasizes the richness of the individual over the demographic style of quantitative research commonly utilized by marketers.

Ethnography can be considered a qualitative description of the human social condition, based on observation. This human condition implies that social phenomena occur within a culture and exist when there is interaction between individuals. Anthropologist Bronislaw Malinowski is considered to be the first to embrace the notion of actually observing, in person, the interaction between individuals. During World War I, Malinowski observed the native culture of Papua by immersing himself in this island culture and documenting the results in the text *Argonauts of the Western Pacific*. Malinowski's methodology was unique in that he used firsthand observation to document and analyze daily occurrences—Malinowski can be thought of as the first to utilize participant observation as an anthropological technique.

Participant observation is an important aspect of Interaction Design, as it formally acknowledges that a product does not exist in a rational and substantial way until it is considered in the context of the larger social fabric. Simply producing a beautiful, useful, or cost-effective item does not guarantee success. The

product needs to fit appropriately into the culture in which it is to be used and sold, and this requires a deep understanding of the value structure of that culture. This is a core distinction between design and art. While art may be appreciated in the eye of the beholder, the artwork can be considered successful on creation (or when the artist deems it finished). The piece of artwork—and the artist—still creates a sense of dialogue with the user, but the dialogue is completely unconstrained. Conversely, design cannot truly be considered successful until the user considers it finished—on consumption. The dialogue has a much deeper set of constraints placed on it, and good design will help the user engage in that conversation fluidly.

Ethnographic tools used by Interaction Designers attempt to understand what people do and why they do it. The first is easy to determine; the latter is tremendously difficult and time consuming to discern. People have a very hard time explaining why they do the things they do, and human behavior often seems illogical when considered by an impartial observer. Therefore, interpretation—making meaning of gathered data—plays a critical role in translating research into valuable design criteria. This act of interpretation is one of the primary differences in skill between design and more traditional market research. Interpretation often requires a leap of faith (or an intuitive jump from one point to another), and while the designer (as artist) learns to trust this intuition, the marketer (as businessperson) is frequently taught to doubt or ignore it. While the latter may end up with a more sound argument, the former may be in a better place to truly empathize with the target audience and provide something of value.

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<sup>6</sup> Malinowski, Bronislaw. Argonauts of the Western Pacific. Waveland Press, Reprint Edition, 1984.

When applied in the context of product development, most ethnographic tools are generally poor methods of determining if someone would buy a certain product, identifying how much someone would pay for a certain product, and understanding what color, texture, material, size, or shape to make a certain product. While tools like surveys or interviews can certainly ask questions relating to these details, people have a difficult time in estimating or remembering details related to this type of preference. Instead, ethnography helps designers identify problems with existing designs (understanding the nuances of product usage); understand how people work, play, and live; and identify why people do the things they do with a product, service, or system. A basic premise of anthropology is that context shapes a great deal of factors in society, and the same holds true when considering the "society" of the workplace or the home. One form of ethnography that emphasizes the importance of understanding work in its natural environment is called Contextual Inquiry.



#### Contextual Inquiry in the context of work

A Contextual Inquiry is similar to an interview but recognizes how heavily an awareness of the workplace conditions will affect and inform action. Ethnographers Hugh Beyer and Karen Holtzblatt have identified four key principles of Contextual Inquiry. These principles help emphasize that the User Is Not Like Me. The principles of focus, context, partnership, and interpretation allow an Interaction Designer to truly understand the hidden work structures—and hidden needs and desires—in a target audience.

Everyone has a point of view. The problem with a point of view is that it both reveals and conceals. When one approaches a problem with a particular direction already established, it is difficult to have an open mind to changes that may take place. However, the opposite is equally as difficult: Approaching a problem with a truly clean slate is nearly impossible. Focus is the acknowledged preset view of what is going to be addressed through the ethnographic inquiry. It gives the designers a central topic to attend to and a statement to rally around. This statement can be thought of as the focus statement and is particularly relevant when trying to articulate the reason behind the research. A focus statement takes the conceptual approach of framing the inquiry.

For example, when conducting research intended to investigate and understand the various tools used in a copy shop, any of the following foci may apply:

 "The focus of our research is to understand the process of creating a printed document."

<sup>7</sup> Holtzblatt, Karen, and Hugh Beyer. Contextual Design: A Customer-Centered Approach to Systems Designs. Morgan Kaufmann, 1997.

- 2. "The focus of our research is to understand the complexity of the tools used in creating a printed document in order to simplify the process for the designer."
- 3. "The focus of our research is to examine the individual printing and binding tools used by the designer in the creation of a printed document, with a particular emphasis on ink, consumables, and maintenance."

The statements become increasingly more specific, and this specificity will provide the design team with much more detailed information. However, this detail is at the expense of the larger, systemwide view. Generating a focus statement, then, must be tied to a higher goal or a set of strategic project statements. These statements, often mandated by a client or an executive, can assist in the directional goals of research in context.

Context implies the interrelated conditions in which work occurs. This principle is the easiest to embrace on a theoretical level but hardest to implement on a pragmatic level. To understand context, go to the place where work occurs: Go to the users, rather than bringing the users to you, and watch what they do as they conduct real work. So simple, yet so evasive!

Consider again the previous example: You are an Interaction Designer working on the development of a printer interface. You want to view context in order to truly understand how people go about printing with their existing tools. This knowledge will give you good ideas of how people print and also will provide insight into problems with existing printers. Can you creep into a print shop and watch a designer go about her day? How can you be sure that she will be using the printer during the time you spend at the office—what if she chooses

to sketch things by hand instead? And consider the amount of preparation required to get into that office for the 1 or 2 minutes of printing. Is it worth your time to travel all the way to the office, get your recording equipment set up, and wait for printing to occur—just to watch someone press a few buttons?

The answer is emphatically yes. It is worth your time, and it is tremendously difficult to rationalize why it is worth your time—especially to a skeptical manager who demands that you remain billable and to a client who is, ultimately, billed. Context offers fodder for innovation. Hidden in the physical work space, in the users' words, and in the tools they use are the beautiful gems of knowledge that can create revolutionary, breakthrough products or simply fix existing, broken products. People do strange things—unexpected things—and being there to witness and record these minute and quick moments of humanity is simply invaluable to the product development process. These details trigger design insights and the equally important rationale to back up design decisions to other members of the design team. But more important than catching the "magical moment" (which most likely won't occur during your visit) is understanding the culture of the context.

Once you have arrived in the physical context, or the environment where work is done, it may seem logical to remain quiet and observe the work as it occurs. Most people assume that they will disrupt the natural flow of work and wish to remain as unobtrusive as possible. As the goal of a Contextual Inquiry is to gather as much rich data as possible, it is important to reject this logic and become an active participant in the inquiry. This participation takes the form of partnership and is likened to that

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of a master and apprentice in the days of guilds. An apprentice did not sit quietly and observe. He became engaged, and tried things, and questioned things, and assisted in the process. When observing people printing in a print shop, it is imperative to ask questions. "Why are you doing that? Is that what you expect to happen? What are you doing now? May I try it?" Experience is a guide to better understand when to ask questions and when to remain quiet, but a master and apprentice relationship will allow an investigator to best understand the nuances of work and truly gain the confidence of the participant being observed.

Interpretation, or the assignment of meaning to fact, is a subjective form of synthesis. It is also the most critical part of the Contextual Inquiry process and the portion of the process that is ignored most frequently. The probable reason this principle is tossed aside? Put bluntly, interpretation is difficult. To interpret data is to ask question after question, making assumption upon assumption, always getting toward the heart of the largest question of all: Why do people do the things they do? Interpretation occurs in context, but the critical interpretation often occurs back in the "lab"—in the design studio, while the designer is sketching or the engineer is building, or in a meeting where data are passed around in nicely printed binders. Interpretation is qualitative and can be wrong. This makes for a difficult combination when trying to justify design decisions. However, interpretation is a creative form of synthesis that provides a smooth and elegant transition between Discovery and the actual generative form of design. A strong interpretation session combining various techniques of data aggregation can yield tremendous results.

Frequently, interpretation occurs in the head of the designer. This "moment of epiphany" may be thought of in the shower or scrawled on the back of a napkin. An Interaction Designer understands the importance of structuring this interpretation into a repeatable and formal process, and a good Interaction Designer is able to communicate not only the pragmatic interpretation but also the necessity of interpretation.

Marketing frequently participates in the Discovery phase of a project. In many companies, Marketing will actually conduct the entire Discovery phase of a project before ever asking for collaboration with Design. Thus, on the surface, Interaction Design and Marketing seem to have a great deal in common. Both fields are interested in human behavior. Both fields care about brand and presentation and understanding the value in human experience with products. The interpretation of gathered data, however, is dramatically different across disciplines. Marketing relies heavily on gathered opinions and generalizations that can be made across a demographic and uses statistical data from a small group to predict what a larger group will do, feel, or purchase. Interaction Design cares primarily about actual behavior (often of the few rather than the many) and uses qualitative data from a small group to inform what could be designed.

#### Focus groups and competitive analysis

A common data-gathering technique used by marketing firms has been the focus group. This method, combined with questionnaires and competitive analysis, creates the core set of tools used to gather opinions, wants, and needs from end users. A typical marketing firm may poll an Internet message board, a group of volunteers, or shoppers at the mall to find out their feelings about existing and novel products. This appears, on the surface, to be strongly user centered and to be a useful way of understanding purchasing trends. While the method can certainly be applied properly, it is also quite easy to misuse or misinterpret the results of a focus group.

A successful focus group depends on a successful moderator. This requires an individual who is unbiased and creative, has the capacity for empathy, can understand and gauge the direction and flow of conversation quickly, and can adapt to unforeseen circumstances. What a rare individual! A focus group depends on a compelling and continual discussion among six to eight people—people who may share similar traits but usually have never met each other before. In a group of this size, there will most likely be personality differences—some differences of the magnitude that can absolutely destroy the value of the entire experience. These differences may include vocal distinctions (someone may simply be louder than the rest) or morale oppositions (people may get into conflict over root issues of ethics and proper behavior). Worst of all, however, is the apathetic focus group—the members who are willing to be persuaded, pulled, and shaped

by the rest of the group. In a situation like this, gathered data will not only be poor, it will frequently reflect the opposite of the truth, and it will most likely be thrown out during analysis.

Most important, poorly run focus groups will highlight hypothetical behavior. A naïve facilitator may ask questions pertaining to opinions and encourage people to consider what they would do or would buy. In a hypothetical situation with fake money, people may be more willing to "purchase" anything—and would most likely pay a lot more in false currency than they would when their wallet is open. These hypothetical opinions rarely translate directly into behavior. Thus, the value of the data gathered from a focus group is entirely dependent on the ability of the moderator; perhaps those engaged in design activities are more capable of engaging users in this type of study than are marketers.

Ethnography performed during the Discovery phase of the design process should be user focused rather than competitively driven. A competitive analysis, or competitive product benchmarking, is a method used to understand the similarities and differences between products that have already been released. The outcome of this technique traditionally includes the creation of a competitive matrix of products, highlighting trends related to features and functions.

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<sup>8</sup> The late Jay Doblin, the founder of Doblin Inc. in Chicago, recalled an anecdote of just such a phenomenon: participants were asked to talk about and discuss a set of pens. Some of the pens were blue, and some were black, and the members of the focus group discussed at length why the black pen was simply superior in every way to the blue pen. After the discussion had ended, the participants were rewarded for their time by being allowed to take a pen for themselves as a "thank you" present. Sure enough—all of the participants selected the blue pens, leaving the "preferred" black ones behind.

While this is a valuable tool for understanding strategic marketplace positioning, it is frequently performed instead of ethnography, user testing, needs analysis, or a more formal product evaluation. This is problematic for a number of reasons. First, the emphasis of the competitive analysis is placed on features rather than goals. By collecting and analyzing similarities in feature sets, the design team has implicitly embraced extra functionality as a goal for design. The quantity and scope of features, however, are nearly irrelevant to the user, who cares about more conceptual issues such as goals, tasks, and activities.

An additional and larger implicit problem with relying solely on competitive product analysis, however, is the assumption that the features the competition has selected to include are the right features. The communication of product features and value throughout the production chain is so skewed within a company that comparing this value set across companies is a nearly useless exercise.

The internal channel communication of distribution and sales is murky and convoluted within a particular company. If the design team simply looks at the competition's features with the intention of copying them, the entire product segment begins to include that irrationally specified feature. Consider how quickly the trend towards enormous SUVs blanketed the vehicle market or how the need to brand an engine ("hemi") found its way through various companies. Discovery should be focused on understanding goals and tasks rather than features or functionality. The articulation of specific features will come later and will be driven by user need rather than by the competitive offerings of other companies.

#### Synthesis, creation, and refinement

After Definition and Discovery, designers begin an iterative cycle of Synthesis, Construction, and Refinement. These phases represent the most elusive and perhaps time-consuming aspects of the design process because they are the most dependent on experience, informed intuition, and talent. These phases, while highly intellectual, frequently rely on rapid ideation sketching (making a breadth of drawings and ideas to explore multiple ways of solving a problem), additional narrative development (through more scenarios and storyboards), and mind mapping as a generative method of problem solving and concept development. Designers work through a messy process of creation and reflection, testing ideas both with real people and also with other designers, all the while honing in on a particular solution. A designer works through both a convergent and a divergent thought process of ideation.

Convergent thinking attempts to locate the best answer—the optimum solution to a given problem. Typically, convergent thought is one that argues away potential ideas until the best idea is left. Designers use this method of thought to hone in on a solution that can easily be presented to other stakeholders involved in the product development cycle. A solution occurring from a convergent thought process implicitly has some sort of evidence that makes it appear to be a proper route to follow, and it is familiar or safe in its correctness. A good designer, however, balances convergent thinking with a healthy level of divergent thinking.

Divergent thinking can be risky, as the output may be unexpected, illogical, and even simply wrong. But divergent thinking also leads to innovative new ideas and challenges traditional

BLAH BLAH, STRATEGIC POSITIONING, BLAH BLAH...

ways of considering products—and doing business. This form of thinking forces the designer to shift perspectives away from the safety of familiarity in order to explore what could be. This is frequently done by producing a large quantity of ideas and suspending judgment of these ideas until much later in the process.

Author Richard Buchanan discusses the importance of shifting "placements" in order to encourage and assist in the development of innovation in design. Buchanan explains that "innovation comes when the initial selection is repositioned at another point in the framework, raising new questions and ideas." He describes how signs, things, actions, and thoughts can be considered in light of one another in an effort to build new and creative ideas. Consider designing a new thing, such as a chair. Now shift the placement to imagine that chair as an action, or a sign, or a thought. This divergence away from the norm—a chair as an object—makes for wildly creative ideas of a chair as a service or sitting as a philosophy; the notion of these placements, and their ability to be shifted, is what Buchanan refers to as the "quasi-subject matter of design thinking, from which the designer fashions a working hypothesis suited to special circumstances."

Divergent and convergent thinking requires a mixture of analytical skills (logic, engineering, and the development of "appropriate solutions") and creative skills (drawing, mapping, "blue sky thinking"). This mixture is a rare but required duality that must exist in a successful designer. A designer will sketch, and think, and diagram, and write—and do these things over and over, each time refining and pruning away the wrong ideas

in order to find the right one (convergent thinking in action). But wrong and right as applied to design are impossibly finite and are obviously the incorrect words. A designer may reject an idea as being "less good," as it does not fit well within the constrained design space, and may temporarily embrace a ridiculous idea that still fulfills the stated constraints or guidelines from the client. The constraints placed on the design are a mix of human, technical, and aesthetic boundaries. The difficulty lies in discerning the hidden constraints, which the process itself helps uncover, and balancing these with the more explicit constraints, often defined by a client or a business executive.

In order to understand if the various creations have succeeded, it is important to test them with real people—people who represent the target audience—and to test not only their appeal but also their comprehensibility. There are both formal and informal methods of testing ideas. A common misconception is that formal methods of testing can only be used with very well- established ideas. In fact, formal methodologies like Think Aloud Protocol can be used even with new, "half-baked" ideas in order to gather data about how useful or usable these ideas are.

Think Aloud Protocol (also referred to as Talking Aloud or simply User Testing) is an evaluation technique commonly used to understand problems people have with software interfaces. It has roots, however, in a subtler and more important aspect of humanity: understanding how people solve problems.

People solve countless problems throughout the day. A problem need not be something as formal as a math equation. Consider the increasingly common problem of understanding how to use a cell phone to make a phone call. Understanding the

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<sup>9</sup> Buchanan, Richard. "Wicked Problems in Design Thinking." The Idea of Design. Eds. Victor Margolin and Richard Buchanan. MIT Press, 1996, p. 9.

various buttons, navigating the menus, and ultimately placing the call is a problem to be solved, and a method to understand how people approach problems of this kind would be of huge value to anyone in the business of shaping complicated user experiences.

Herb Simon, arguably the father of the field of artificial intelligence and a beautiful thinker, was also interested in how people solved problems, yet his goal was a bit more lofty than creating a cell phone. In order to create intelligent computer systems that may simulate or predict human behavior, one must first understand how human behavior itself works. Simon, along with Allen Newell, developed a series of experiments to understand issues of cognition and working and long-term memory. 10 Through these experiments, Newell and Simon determined that, among other things, people could articulate what they were doing, as they did it, without affecting the outcome of the task. That is, a person can attempt to dial a cell phone and explain what he is doing, as long as he is not prompted to explain why he is doing it. This running description of action—formally called a protocol—is, ultimately, an intimate look at the contents of the working memory in a participant. Evaluators can use this technique to understand what someone is doing and can later interpret why that person

did it. By understanding what people have done, designers can begin to understand when they have errors and can interpret, or create credible stories about, these errors. Additionally, designers can understand the rationale behind actions by seeing them in totality. Actions will appear as a running set of steps in a task to achieve a goal. The protocol can be interpreted by designers, who can then contemplate the underlying behavior that occurred.

In order to successfully conduct a Think Aloud User Study, a designer requires a prototype, a participant, and a set of tasks. A prototype is a representation of the final product. The prototype can be of any fidelity. For example, if testing a piece of software, the prototype can either be a functioning and working version of the software or a simple set of hand-drawn screens. When testing physical products, the level of finish given to the testable model is relative to the complexity of a task.

Just as the prototype should be representative of the final design, so should the participant represent the end users of the creation. For example, when testing products intended for use in an industrial kitchen, it is worthwhile to find participants who spend a great deal of time in industrial kitchens and actually represent the target audience of the product.

A set of tasks will be given to the participant. These tasks attempt to engage the participant in actions that represent normal behavior when using a product and should thus be structured around predictable and probable goals a user may have.

Once the prototype has been created, the participant has been recruited, and the tasks have been established, running the study is straightforward. It is, in fact, so simple that it may seem too easy. The difficulty is not in the mechanics of the procedure,

Herb Simon and Allen Newell are responsible for a number of advances in the fields of computer science and cognitive psychology and can continually be found throughout the literature relating to Interaction Design and Human Computer Interaction. Newell worked with Stuart Card and Tom Moran in developing a unified vision of human-computer interaction when the field was still in its infancy and ultimately co-authored the text The Psychology of Human-Computer Interaction. He helped build the computing system and computer science department at Carnegie Mellon University. Simon's list of accomplishments is no less impressive and includes the ACM A.M. Turing Award in 1975 with Allen Newell and the Nobel Prize in Economics in 1978. Newell and Simon are continually recognized with the Newell-Simon Hall at Carnegie Mellon University, which houses, among other things, the Human-Computer Interaction Institute.

but in the interpretation and application of the results. The prototype is presented to the participant, and he is instructed to use it to accomplish the tasks. He is then asked to think out loud as he uses the prototype: He is to vocalize what he is doing throughout the task. If he falls silent, the facilitator will prompt him to continue talking but will be unable to help him in any way. These instructions frequently become comical as participants realize that they are, truly, on their own. Once the rules for the study are established, and a sample think aloud is demonstrated, participants generally take to the technique quickly and only a little prompting is required to keep them continually verbal.

Less formal but still useful versions of the technique have evolved that focus more on moderator-led probing and less on simple vocalization of working memory. Moderators may ask questions like "Is that what you expected to happen?" or "You look confused—is there something on the screen that isn't what you expected?" in an effort to draw out reactions from participants. The value of any form of user testing is in the critical incidents that are recorded during the protocol: "By an incident is meant any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act... To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects." 11 These incidents usually

indicate design errors relating to navigation, cognitive structure, or labeling and can be wonderful insights into the way people approach problems relating to designed interfaces and objects.

Perhaps even more valuable than uncovering usability problems, however, is the direct manner in which these usability problems can be communicated to stakeholders and others involved in funding or judging a project. Video of the user testing can be shown to engineers, project or product managers, marketers, or others involved in the development of a product. The reactions of real people serve to appropriately contextualize the designs that have been created. Rather than having debate or discussion about what could happen, invoking a hypothetical use case, this type of user study presents something that did happen with actual people. The value of a video record cannot be overstated.

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11 Flanagan, John. "The Critical Incident Technique." *Psychological Bulletin*, 51 (4), 1954. pp. 327-358.

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#### **Thoughtful reflection**

The final step in the framework proposed by Zimmerman, Evenson, and Forlizzi focuses on Reflection—the act of assessing success. "Design researchers can examine their own process throughout the case and identify opportunities for increasing efficiency. Also, through the collection of reflections and summaries of many case studies, designers can begin to develop models that allow them to more accurately estimate both the time and resources needed for future projects."12

Unfortunately, this critical step is nearly always ignored by professional designers. Assessment implies internal criticism, something many companies prefer to leave up to public relations or external product reviews. The assessment must be at a user and project level, rather than a quality assurance level, and benchmarks for success have generally not been developed or acknowledged within corporate America. In many high-pressure design consultancies, to reflect means to waste time. Reflection is not productive and is frequently viewed as a poor use of money and resources.

Design is a creative field, and in order to successfully create, one must achieve a sense of Flow. 13 Flow is, among other things, the absence of self-doubt and the nearly auto-telic and automatic creative process. Beginning students of design are painfully aware of their process. They reflect and doubt and self-criticize

both their creations and their skills. They are like the gawky 13-year-old girl who has sprouted up too quickly, nearly a head taller than the rest of the kids, and obviously slouching to fit in. To be so painfully aware of so-called deficiencies causes others to notice and comment on these shortcomings as well. Malcolm Gladwell discusses the fragility of process in his text Blink, making the connection between the creative process (flow) and the sports process (in the zone): "...problems that require a flash of insight operate by different rules... as human beings, we are capable of extraordinary leaps of insight and instinct... all these abilities are incredibly fragile. Insight is not a light bulb that goes off inside our heads. It is a flickering candle that can easily be snuffed out."14 A mature designer respects and embraces the often ill-structured nature of the process, and—because he knows to expect messiness during the act of creation—he promptly forgets about it completely. Process becomes innate, and the phenomenon of design intuition takes over.

The process described above is very succinct and appears to be quite linear. In fact, the process is elusive, recursive, and messy, and a cohesive process frequently means a process of relative unawareness of structure. That is, there is rarely a definitive declaration of beginning or ending to any of the steps mentioned, and while the steps generally follow the order presented, there is often overlap and reordering of processes. The messiness of process can be difficult for designers, and even harder for clients, as each project is unique and it's difficult to predict (at a detailed level) what will happen at each stage.

<sup>12</sup> Zimmerman, John, Forlizzi, Jodi, and Evenson, Shelley. "Taxonomy for Extracting Design Knowledge from Research Conducted During Design Cases." Futureground 2004 (Conference of the Design Research Society) Proceedings, Melbourne, Australia, November 2004.

<sup>13</sup> Csikszentmihalyi, Mihaly. Creativity: Flow and the Psychology of Discovery and Invention. HarperPerennial, 1996.

<sup>14</sup> Gladwell, Malcolm. Blink: The Power of Thinking Without Thinking. Little, Brown, 2005. p. 122.

Externalization of the process—taking the reflective, intuitive, and messy parts of design and finding a way to draw them, model them, or represent them in reality—becomes critical for rationalizing and communicating the process of design.



### The role of intuition

Design intuition is most likely not a genetic disposition to be creative. In the same way that one is not predisposed to be a doctor or a lawyer, a designer must ultimately select a career path and hone the particular skills necessary to succeed in that path through a great deal of practice. What many refer to as *intuition*, then, is not the untaught or unteachable but instead is a learned understanding and respect of process, molded by experience and refined over a great deal of time and practice. Designers may appear to work based on intuition, but the magical nature of an innate process carries little weight among engineers or business owners. Designers have learned to externalize and justify the above process along the way, in an effort to alleviate the pain that may come from explaining how a design "just feels right."

A designer who trusts her intuition does not abandon the procedural set of pragmatic steps as outlined above. Instead, she learns to balance this process with two outside forces: confidence, and personal experience. Confidence allows the designer to form an opinion and then believe in it. This confidence is informed by personal experiences, experiences that rarely have anything to do with the subject matter of a given design problem. Philippe Starck, a French designer who has found his way into popular retail stores and thus into the lives of many Americans, has been one of the most vocal proponents of so-called intuitive design. His confidence is obvious in the dramatic, and often amusing, style of his work—and the experiences from which he seems to draw have nothing to do with design and instead frequently pertain to sex or the erotic nature of the human form.

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Starck explains that as a designer, you "must have your own responsibility, your own consciousness... I work only with intuition." It is interesting, then, to see the highly charged results of such an intuitive approach—Starck lives extravagantly and has thus been continually described as a "sellout" or a "playboy." He might be both, but the dramatic success of his products at Target implies that he is succeeding in evoking emotional responses with his intended audience.

Not all of the well-known and successful or high-profile designers have embraced intuition in the process of design. Stefano Marzano, CEO and Chief Creative Director at Philips Design, has vocalized a near polar opposite view of the role of designer. While Starck explains that "... there are already thousands of really, really good chairs. There are thousands of good lamps. There are thousands of everything... I am not interested in designers," Marzano takes a much more refined and intellectual approach, and views a process-driven design methodology as a business differentiator. During a speech to the German Marketing Association Conference in Hamburg, Marzano explained that "... 'arty' product design, the sort of strikingly individual designs produced by Philippe Starck... may help provide differentiation for a while, but it is easily imitated and soon becomes a commodity." Instead of relying on the artistic intuitive, Philips practices a

user-centered design process that relies on researching "social, cultural and visual trends by various international institutes and universities" in order to help shape complicated experiences.<sup>17</sup>

One can ultimately consider the outspoken artist of Starck and the humbler approach of Marzano as having the same positive focus: a focus on people, and emotions, and on making the world a better place to live in. This may embrace the visual aesthetic and lead to the production of objects of visual beauty or focus on the creation of products that save lives and increase the value of the human condition. Both designers, however, view the role of design as a human-centered, emotionally driven, complicated, and culturally informed process of creation.



17 Marzano, Stefano. Presented at the German Marketing Association Conference, held in Hamburg on November 9, 2004.

<sup>15</sup> Starck, Philippe. Lecture at Harvard University Graduate School of Design: Design Arts Initiative Lectures. October 1997.

<sup>16</sup> Designboom. Interview with Philippe Starck. May 23, 2005. <a href="http://www.designboom.com/eng/interview/starck.html">http://www.designboom.com/eng/interview/starck.html</a>

### The role of Design in considering the whole

When Design occurs in a business, a project changes hands several times; different groups claim ownership at various points in the project. In some larger companies, designers frequently complain of the "over the wall" problem. Research is conducted by Marketing and "thrown over the wall" to the engineers. The engineers build to the written specification, and over the wall it goes to the designers. The designers are left to do the plastics or push the pixels, and there is little communication or cohesion between disciplinary entities.

The designer mentioned above, Philippe Starck, designs a product as an isolated object, and while his products are sold in large retailers like Target, his specific design consultancy is small. As a result, Starck generally enjoys making executive decisions spanning across Design, Marketing, Engineering, and Distribution. A designer at the larger entity of Philips, however, may be much more constrained to specific actions and may not have any input into issues tangentially related to design. In a development team made up of Engineering, Marketing, and Design, each participant has a distinct role to play and the relationship forged by the various disciplines helps determine the relative success of the product.

The engineer may be responsible for the functionality of the product, and in the case of digital or electronic products, that functionality is frequently embedded in emerging technology. The engineer implicitly becomes the advocate for technology. While not necessarily proposing the latest technological advancements, the engineer remains responsible for making sure that a product is technically sound and that

it functions correctly. Similarly, a marketing manager may be responsible for ensuring that a brand presents a consistent and compelling image. This may include understanding the target demographic as well as gaining an awareness of purchasing patterns and buying trends. A project manager may own the product development schedule and be responsible for delivering the project as specified, on time and on budget. Each player in the development of a product has a primary focus.

An Interaction Designer, too, takes ownership of a particular area of expertise. While engineers may be advocates for function and marketers for brand, an Interaction Designer becomes an advocate for humanity and behavior. This advocacy must occur on various levels of detail as a project progresses from a business goal into a tangible form.

At the beginning stages of a project, an idea may be driven solely by a business necessity: increasing profits, gaining brand equity, or disrupting a traditional channel leader. An Interaction Designer, if invited to discuss the project at this stage, may ask questions like "Does the user need this product at all?" This view might be informed by an understanding of culture, or an intricate care and love of society. It may, however, simply be a representation of viewing the world through a technologically wary filter. This is clearly a philosophical question first; the right answer may be the wrong business suggestion, and Interaction Designers are rarely invited to discuss the project at this stage. This is unfortunate. If the process of Interaction Design is to be applied to the business processes themselves, designers need to be firmly embedded in the upper echelons of the corporation or have a strong relationship with those upper levels of management. To achieve

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this level of executive influence, designers need to be more versed in rationalizing their human-focused recommendations with financial data and speaking the language of the boardroom.

Farther along in the process of product development, it may become apparent that particular elements of functionality are more difficult or expensive to implement. At this stage in the project, an Interaction Designer is responsible for forcing a dialogue of cost/benefit analysis from the perspective of the end user. How much contextual evidence is there for such an element of functionality? What is the value of a more expensive piece of technology, measured on a human scale, rather than a financial scale? At this point, the designer shifts to speak in terms of value proposition.

As a project nears completion, Interaction Designers are frequently called on to consider the visual aesthetics of a solution. This detailed level of refinement gives an Interaction Designer a final chance to advocate for the end user—this time, on a purely emotional, or visceral, level. In this way, Interaction Design often becomes synonymous with Interactive Design or Graphical User Interface (GUI) Design.

Interactive Design focuses on the development of interactive systems, placing technology at the center of attention and ultimately emphasizing authoring techniques. These authoring techniques frequently focus on the visual aesthetic of content presentation—the eye candy relating to interfaces. GUI Design takes a similar approach, emphasizing the nature of technological constraints and platform-specific paradigms. While these two disciplines certainly cater to a user, they place a dramatic degree of emphasis on technology and allow technical con-



straints to guide the development of interfaces. An Interaction Designer will most likely have skills related to Interactive Design or GUI Design, but these skills do not define his existence.

At the core of an interaction is the dialogue between a product, system, or service—and a person. Design exists as a means to a greater end—enhancing the human experience, solving complicated problems, and ultimately creating designs that resonate with their audience. Understanding that design work has direct consequences on people adds a unique, and humane, side to the elements present in the act of creation and dramatically shifts the focus of what could otherwise be thought of as technical artwork. At the heart of the Interaction Design process is a simple notion: that design should be user-centered and that the only way to truly understand what users want or need is to interact with them. The process describes attempts to capture what people do, think, say, and want so that a designer can create usable, useful, and desirable creations.

THAT'S A LOT OF CASH,
OVER THERE...

# CHAPTER TWO: MANAGING COMPLEXITY



During the process of design, an Interaction Designer attempts to construct meaningful visualizations between individual components in an effort to understand hidden relationships. The ultimate goal of the creation of these visualizations is to understand. By reframing ideas in new and interesting ways, a designer can gain a deeper understanding of the abstract and semantic connections between ideas. These visualizations can then be used to communicate to other members of a design team or as platforms for the creation of generative sketching or model making. The act of diagramming is a form of synthesis and is a way to actively produce knowledge.

### Structuring data in order to make useful information

Many Interaction Designers find themselves simultaneously filling two roles: Interaction Designer and Information Architect. The discipline of Information Architecture has gained recognition primarily in web development, usually associated with mapping out and understanding the connections within large, complicated websites. The discipline and techniques also shape the underlying structure of proper Interaction Design, as the Information Architecture techniques seem to illustrate how a successful Interaction Designer approaches any design problem at all (regardless of medium or intended outcome).

Author Richard Saul Wurman is responsible for coining the phrase Information Architecture in 1975. His background, in the traditional field of architecture supports his interest in way finding and navigation. The world of Information Architecture can be thought of as a discipline of map making, but maps need not be related only to geography. People use a map to find their way, and they need to find their way whenever they are lost. Sometimes, however, maps are used in an exploratory manner, simply to discover what is unknown. Clearly, the level of complexity of modern and futuristic products and systems will disorient a great number of people. By understanding—and visualizing—connections between elements and seemingly unrelated systems, an Interaction Designer can provide the common trail toward understanding.

One of the largest and most documented usability issues evident within the structure of software concerns navigation. Specifically, people don't truly understand where they are, where they have been, and where they are going as they traverse digital products, services, and the Internet itself. Nor should they, as the concept of placement within a virtual system is truly foreign, and no matter the metaphor provided, most people don't really understand—or have time to understand—the essence of computing across a large, distributed network. The vastness of the structure of the web is simply too large for many people to actually consider. The conceptual undertaking of visualizing something that has no immediate physical manifestation is a difficult task to engage in. While the web is an obvious example of this sort of limitless environment, the same general location-based confusion is evident in the menu systems of smaller handheld devices, such as digital cameras and telephones, and in embedded systems in vehicles (intended—ironically—to aid in physical navigation).

Alan Cooper discusses the issue in relation to permanent objects or reference points:

One of the most important aids to navigation is a simple interface without a lot of places to navigate to. By places, I mean modes, forms and major dialogues. Beyond reducing the number of navigable places, the only way to enhance the user's ability to find his way around in the

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program is by providing better points of reference. In the same way that sailors navigate by reference to shorelines or stars, users navigate by reference to permanent objects placed in the program's user interface. 18

Authors Peter Morville and Louis Rosenfeld agree in their text *Information Architecture* but acknowledge that this is easier said than done:

Many contextual clues in the physical world do not exist on the Web. There are no natural landmarks and no north or south. Unlike physical travel, hypertextual navigation allows users to be transported right into the middle of a large unfamiliar web site. Links from remote web pages and search engine result pages allow users to completely bypass the front door or main page of the web site. <sup>19</sup>

Design. John Wiley & Sons, 1995. p. 508.

### Data, Information, Knowledge, and Wisdom

Design literature frequently mentions a four-step process taken as individuals gain comprehension. This comprehension could be an understanding of digital--spatial relationships in a complicated system or the awareness of how to achieve a goal. This four-step process attempts to move from Data to Information to Knowledge and, finally, to Wisdom (DIKW). The path has been routinely analyzed in fields of Information Technology and Knowledge Management and is mentioned by designer Nathan Shedroff in a brief article titled "An Overview of Understanding." Interaction Designers can think of this DIKW path as a framework for progressive learning. One goal of design may be to assist people through this path as they use designed creations.

Data alone has little value. Although data usually implies numbers, it simply represents discrete units of content.

This content may be factual or opinion driven, and it may be useful or useless. Creating information out of data may seem a simple task, then: Present to the user the units of data that are relevant and remove the rest. What, though, would be deemed relevant in, say, a painting? Are the marks on the canvas relevant bits of data? What about the absence of marks—the whitespace? Or the implied marks, found in the gesture of the applied paint? Making information out of data, a seemingly easy task, is quickly confounded when the designer attempts to integrate elements of aesthetics or emotion.

<sup>18</sup> Cooper, Alan. About Face: The Essentials of User Interface

<sup>19</sup> Morville, Peter, and Rosenfeld, Louis. Information Architecture for the World Wide Web: Designing Large-Scale Web Sites, p. 50. Copyright © 2006, 2002, 1998. O'Reilly Media, Inc. Used with permission. All rights reserved.

<sup>20</sup> Shedroff, Nathan. "An Overview to Understanding," Information Anxiety 2, p. 27.

Information can be thought of as meaningful data. This is usually created by design—using the creative process to bring together elements and to form semantic relationships that, perhaps, were previously hidden in the irrelevant data. To know that it is raining in Pittsburgh is data. To understand that it has been raining in Pittsburgh for the past week and you are visiting the Steel City tomorrow is informative: You had better pack your raincoat. Information is the organization of data in ways that illustrate meaning. This organization may, in fact, alter the meaning itself. This has an important implication, as the meaning of seemingly objective data is altered by the appearance and structure of that data.

If information is meaningful data, knowledge, then, is a result of the combination of elements of information in order to arrive at a principle, a theory, or an argument. While information may be sensory, knowledge seems to be more complicated and perhaps more experience driven. Storytelling has a long history as a mechanism of knowledge transfer and can be considered a rapid immersion in experience: One cannot experience time travel, but one can gain knowledge about the act of time travel through a rich, compelling, and highly experiential story. This idea of knowledge as extended dialogue is highly relevant when considered in the guise of experience and Interaction Design. The design of behavior may, in fact, be the design of action-based knowledge (telling a story through motion).

Wisdom, often thought of as enlightenment, results from applying knowledge in a new and novel manner. There is wisdom to be found in emotion—in happiness and pain—and even the youngest designer can apply knowledge and emotion in new ways given the opportunity.

This path from Data to Wisdom may be the underlying goal of all Information Architecture activities. The acquisition of Knowledge obviously occurs over time, and this is where an Interaction Designer excels. Behavior occurs in the fourth dimension, and Interaction Design techniques attempt to understand and, hopefully, shape the way people act over time.



### Designing with the fourth dimension in mind

Traditional designers of artifacts—Graphic Designers or Industrial Designers—typically view the relationships between a product and a person in a very finite sense. A user may interact with a toaster through a discrete set of actions (place toast in toaster, set brownness level, press toast down, wait for toast to pop up, remove toast), and the designer is responsible for creating a product that affords, or encourages, all of these activities. This view of affordance implies ease of use and clarity of task. It needs to be apparent to a user that he has a certain role to play, and if he plays it correctly, he will have a nice breakfast.

While this view is useful for the design of simple and relatively mundane objects, it simply doesn't work for the creation of complicated interfaces that exist for an extended period of time. Consider the length of an engagement between a person and a Microsoft Outlook Inbox. When first acknowledged (or installed), Microsoft Outlook is very exacting. Every installation of Outlook will be the same; the toolbars will be in the same place, each element will behave in the same way, and the system will be very predictable. If the system is predictable, the dialogue between the system and the user is also fairly predictable. Designers can guess, with a fair degree of accuracy, what will happen. At the very best, this guessing can be substantiated: Designers can, during the creation of this project, do a bit of contextual research and actually watch people go about using a prototype of Microsoft Outlook.

This accuracy quickly diminishes as real life takes over.

People set up mail accounts. They receive and respond to mail.

They use Outlook to organize their life, rather than to simply

organize their mail. They make errors and customize palettes and change color schemes. And over time, Microsoft Outlook becomes a very different product from the original installation. It is very difficult to model what might occur even a week past the initial installation of this software, as the complexity of real life makes for an exponential curve of change. Nonetheless, an Interaction Designer may indeed be asked to find a way to model this complicated scenario. This fourth-dimensional pattern of use—understanding how time plays a role in the use of a product—begins to clearly articulate the distinctions between two similarly named and commonly confused activities: User Interface Design and Interaction Design. Both activities are usually performed by the same person but with dramatically different purposes.

A designer focusing on the User Interface (UI) or the Graphical User Interface (GUI) is generally not concerned with time as a defining characteristic in the use of a product. While she may consider the flow of use on a "page" (used loosely to illustrate one particular chunk of material being presented) and may even think of the flow of use from "page to page," she is not considering the long-term consequences of use at this stage in design. Her focus is instead on widget placement and button labeling and pixel-level decisions of screen real estate. Sometimes, the rare software developer with a visual eye may take on the role of UI Designer. Additionally, UI Designers with a particular competency in development may take on the often ambiguous role of UI Developer, blurring the lines between design and implementation. The expert blindspot rears its ugly head: Developers are, by definition, aware of technological constraints and will force their design to

appease these constraints. While certainly a benefit to short development cycles, this technology-centric attitude will come at the expense of usability. The UI Developer will generally not consider conceptual solutions to the problem that, while more usable, may involve dramatic back-end development changes.

Only after an Interaction Designer has modeled conceptual behavior related to activities and goals will he attend to the pragmatic details of UI design. This conceptual modeling is a process of design synthesis and allows the design team to manage what may seem like an overwhelming quantity of often contradictory data. Synthesis nearly always involves a process of mapping, diagramming, and modeling. These diagrammatic artifacts act as generative tools that help designers produce new knowledge that is fundamental to making sense of the complicated design space.

There are a number of established methods for creating diagrammatic representations of complicated systems. Simple diagrams abstract a great deal of data in order to emphasize only those elements that are most important. The word *simple* does not imply *trivial*, as these diagrammatic representations form the cornerstone for contextualizing data—for moving from data to information.

### **Affinity Diagrams to Organize Data**

An affinity diagram is a visual representation of a taxonomy, or the words used in the context of a specific design problem. Affinity, meaning likeness, implies a sense of similarity between words. Designers seek this similarity in order to identify the core facets of a problem space and to remove elements that hint at so-called edge cases, or less likely scenarios. Generally, an affinity diagram is used during the initial stages of synthesis in order to identify patterns and themes in a large quantity of data.

The first step in creating this diagram is to list all of the elements in the context of a particular problem on discrete note cards. An element can be a word, phrase, quote, image, photograph, or any other piece of data that is related to the problem context. Often, designers will transcribe entire interviews or contextual inquiry sessions onto individual note cards, creating the affinity elements directly from ethnographic data.

Once the data have been externalized, the cards are physically repositioned based on similarity, with related ideas placed in proximity of one another. Because all of these ideas are fundamentally linked, this is a process of interpretation and judgment. Each designer needs to make her own decision about why an item is linked to another item and how similar an item is to another.

The affinity diagram is usually constructed by a group or team. Some practitioners recommend performing the affinity diagram sorting activity entirely in silence to avoid biasing the organizational activity. Others embrace the subjectivity of the exercise by vocalizing each move, articulating a rationalization for the placement. In both cases, however, the result is a grouped list of discrete elements, with the groupings identifying thematic similarities in the data.

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# **Concept Maps to Visualize Systems**

A concept map is a visualization of present understanding of a system. It is intended to represent the mental model of a concept—to allow members of the development team to see the "forest and the trees." Generally, a concept map links nouns with verbs. It provides a visual way to understand relationships through literal connections as well as through proximity, size, shape, and scale. The tool is intended to illustrate relationships between entities. The act of creation is generative in the sense that the designer must make subjective value judgments on the strength of the relationships.

The first step toward creating a concept map is the creation of a concept matrix. This matrix lists all elements relevant to a particular domain (nouns) and attempts to identify which items have a direct relationship. Consider, for example, an analysis of the game of baseball. One may identify nouns such as Ball, Bat, Umpire, Hot Dog, and Catcher as well as nearly one or two hundred other terms. By creating a matrix to illustrate the connections between these elements, the designer is forced to analyze the extent of the relationship. All of the words are implicitly related, as they all have to do with the overarching domain of baseball. However, Ball is more closely related to Bat than it is to Hot Dog. By analyzing each and every term's connections to one another, the designer is forced to zoom in on the details to such an extent that he gains an intimate understanding of a discipline. He can then begin to understand the (sometimes obvious) hierarchy that exists within a large

FROG INTERACTION DESIGNER ASHLEY MENGER MUNCHES ON A POST-IT NOTE WHILE COMPLETING AN AFFINITY DIAGRAM

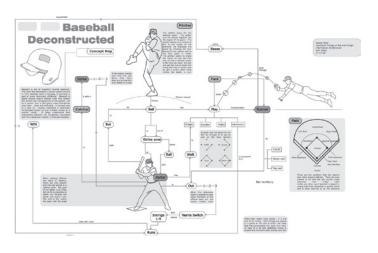
quantity of data. The elements with more relationships become the main branches on the concept map: They become the glue that holds together the overarching discipline.

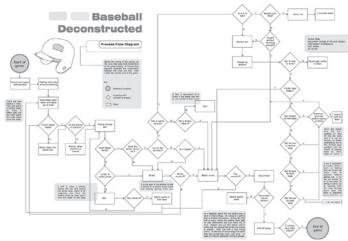
Once the matrix is created and these core concepts are identified, completing the concept map becomes a rather simple activity of connecting nouns with verbs. How are Ball and Bat related? The Ball is Hit with a Bat. How are Catcher and Ball related? The Catcher attempts to Catch the Ball. As these are added to the diagram, the designer—and eventually, the entire development team—can visually trace relationships between entities and understand how a potential change to one aspect of a system may ripple through the system as a whole.

### **Process Flow Diagrams to Show Decisions**

Process flow diagrams are another visual form of organizing data into comprehensible systems. Also known as data flow diagrams or decision tree diagrams, these diagrams have traditionally been used in the fields of electrical engineering and computer science to illustrate the logical flow of data through a system. These diagrams can be created relatively quickly, prior to implementing complicated systems, and then manipulated to understand the optimum flow of data. Interaction Designers use process flow diagrams for a similar purpose. These diagrams assist in understanding the discrete rules, and their relationships to one another, that make up an activity. This analysis tool

LEFT: PAYAAL PATEL DESCRIBES A GAME OF BASEBALL THROUGH A CONCEPT MAP
RIGHT: PAYAAL PATEL DESCRIBES A GAME OF BASEBALL THROUGH A PROCESS FLOW DIAGRAM





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can then be shared with engineers in order to articulate and demonstrate the rationale behind design decisions. It can be used both as a generative exercise as well as an explanatory tool.

To create a process flow diagram, an Interaction Designer first identifies, through various forms of ethnography, the operators in a system and their roles. These operators include many of the nouns present in the concept map. Then the *logic flow* is mapped out to connect the operators with actions. Take, for example, the phenomenon of a telephone ringing. The phone rings once and there is a clear path of available (and logical) repercussions to this ring. The caller may hang up, the telephone may be answered, or else the phone will ring again. This will happen several times in a row, at which time a new choice becomes available: The call may be answered by a voicemail system.

By creating a process flow diagram, the designer has formed an intimate understanding of the possible logical outcomes of use with a system. While the diagram itself can be useful throughout the project, the act of creating the diagram is of much more importance. Those involved in the production of such a diagram have created a strong mental representation of the boundaries of a complicated system.

# **Ecosystem Diagrams to Show Engagement Points**

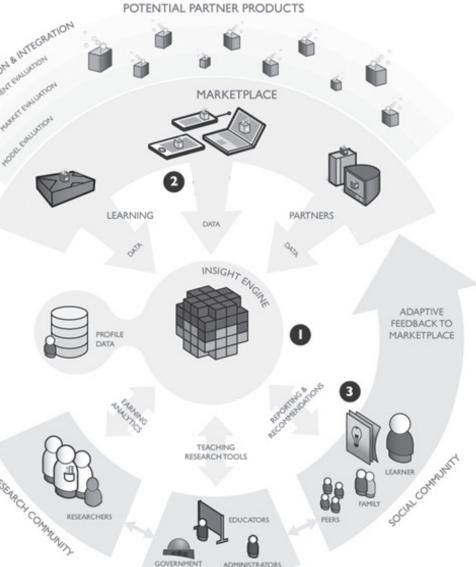
An ecosystem diagram is a visual representation of a system or brand, commonly used to describe a set of user engagement points. Rarely does a company offer a single product that stands on its own, particularly in the context of a global brand. Consider that a company will likely have a physical product, sold at a point-of-purchase display, with software that installs on a computer, requiring access to a networked service in the cloud. The product may point a user to a website for support, and there might be training sessions held in large cities for customers. The individual product might work well with other products by the same company, and it might be compatible with products from partner organizations. Each of these elements will be designed, and the benefit to both the user—in predictability and compatibility—and the company—in customer loyalty, revenue, and centralized support—is enormous when they are all designed to work in concert with one another.

The ecosystem diagram describes these various touchpoints in a visual manner, illustrating the conceptual relationship between the various system touchpoints. Frequently, this diagram is made without regard for the sequence of actions a user will perform. Instead, it's more important to visually indicate all of the possible ways a customer might interact with a specific system. Additionally, while an ecosystem diagram can be used to describe the present situation (commonly showing points of failure or incompatible systems and products), it's useful during synthesis to create a provocative representation of the ideal situation.

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There are many ways to create an ecosystem diagram. One way is to start with a given product and spiral outward, thinking of the related products, services, or support structures that are semantically connected to it. Another method is to create a set list of possible touchpoints and attempt to better describe those that make sense given the specific situation. Commonly, this list will include likely engagement locations, such as Point of Sale, In the Home, At the Office, and On the Go. A third method is to use an existing concept map, and zoom out of it to consider elements on the periphery. In all cases, however, the goal is to create a visual representation of the various touchpoints, using connecting lines and descriptive text to illustrate how one touchpoint relates to another and how they all fundamentally relate to the end user.

LEFT: AN ECOSYSTEM DIAGRAM FROM FROG DESIGN DESCRIBES THE RELATIONSHIPS BETWEEN SYSTEM TOUCHPOINTS.

NEXT PAGE: A JOURNEY MAP FROM FROG DESIGN ILLUSTRATES HOW A CUSTOMER WILL ENGAGE WITH VARIOUS PRODUCTS AND SERVICES OVER TIME.

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### Journey Maps to Show a Broad Sequence of Interactions

A *journey map* describes the sequence users go through, over time, as they encounter the various facets of the ecosystem diagram. This type of map is used to hypothesize how a product will be acquired, installed, learned, used, and upgraded or discarded and forces a consideration of design at each step in the customer journey. Frequently, these diagrams are used to describe a linear and best-case scenario of engagement, but they are also incredibly effective to encourage discussion of deviant cases, such as failure, misunderstanding, or product return.

Like the ecosystem diagram, the journey map attempts to visualize the various touchpoints users will have with the larger context of a product. It commonly describes how they acquire the product, how they set it up and learn about it, and even how they may share the product with friends. Unlike the ecosystem diagram, however, the journey map purposefully captures a sequence of actions and therefore attempts to capture how users will learn about the product, how that knowledge will be repositioned later in journey, and how a product will evolve over time based on both intended and unintended usage scenarios.

A journey map can be created by telling a forced narrative to capture not only the common use cases related to a product but also those on either extreme end of the use timeline. The design team will first create a list of touchpoints, starting with the earliest acknowledgment of the product in a user's life (how did she hear about it) and ending with the last reference to the product in the user's life (how did she dispose of it when it broke?). Then the team can discuss and hypothesize things that may happen at each step and document these. Commonly, these

facets are organized into logical groups such as Assumptions, Actions, and Knowledge Acquired. As the team works through all of the customer touchpoints, they begin to create a broad timeline of user engagement, illustrating how a product can grow and evolve as a user becomes more comfortable with the item.

Both the ecosystem diagram and the journey map recognize that no single design is ever considered by a user in isolation and that all designed products are deeply intertwined with other compatible and competing designed products. Author Don Norman writes that "no product is an island. A product is more than the product. It is a cohesive, integrated set of experiences. Think through all of the stages of a product or service—from initial intentions through final reflections, from first usage to help, service, and maintenance. Make them all work together seamlessly. That's systems thinking."<sup>21</sup> The ecosystem diagram and journey map work together to force this systems thinking.

An Interaction Designer attempts to construct meaningful visualizations between individual components in an effort to understand hidden relationships. The ultimate goal of the creation of these visualizations is to understand; by reframing ideas in new and interesting ways, the designer can gain a deeper understanding of the abstract and semantic connections between ideas. This understanding can then be applied to the development of a system, service, or artifact.

<sup>21</sup> Norman, Don. "Systems Thinking: A Product Is More Than the Product."

Interactions Magazine, Issue XVI.5, September/October 2009.

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and outline fore the

### Meeting Evangelists

The recommend stage is short but crucial. Its asserts are oppointable and molivated owners. and or users of Halo. Their experiences with the system are so positive they often feel compelled to tell people about it when the occasion presents itself. These occasion are archetypal

- bad business trips & loss of family time updiess teleconferences
- managing time consuming & dangerous travel new technologies in business









When a customer goes through The purchase process they receive materials about outlomicing Halo to their needs and their construction process. These materials outine the componentization of the system, lead times and a general project plan.

Purchase Process

All the Learning Products that come with the system are bundled in one high-quality package. The quality design of the Ownership flunds represents the quality





### Training

The Training Presentation is given by experienced users, or initially by HP. The employees who were trained by HP in a Halo session will train returns if the most prison.

This presentation is structured based on the UII and room infrastructure as outlines, as opposed to the meeting structures.









### Regular Use

This is the day to-day use of the sustem. These meterials are passed around and emailed within boop ristriam of anolesingout Halo meeting management and ensures the system is used to its full potential. The User Guide outlines help-through meeting and assistance frameworks.







This is when Execs, Admins and Users of the system are so excited by the experience they take on new roles in the organization to shipherd the use of Halo.







trial use is being-conducted in.

Trial Use

### Hand-offs

in the executive network a holder of a git gives. It to another Exec or an Admin to introduce them. to Halo. The executive off is the first touch point for a potential customer. The quality of this gift sets the stage for the high-end value of owning Halo.







### Chance

The meterials and employee for this exposure point are usu-ally created by Marketing and Sales for high-end dealers like Steelcase, or ads in business publications, or trade shows. Any audience can see these materials and be inspired to seek out a trial use of Halo

This is the key moment for all audiences who get to

demo Halo for the first time. They use a Quick Start sheet in this session and can have a Take-Away Card. It

outlines the experience of a meeting and the room itself. This card is localized (languages, self-up) to the room the

000











### Installation

This the contact information the Exec or Admin receives when the product is shipped. It outlines the details of the process till arrival, how much time, what is expected etc. There is also an executive summary for the Admin to hand to the exec. This represents an attention to detail and service that Halo provides.

These materials should show the beauty of the installation process and detail everything involved in configuring the system for their business. This is another touch point in staging quality.









### Spreading the Word (externally)

This is when Europ and Adming are so swilled by Halo they close the loop and follow similar preaching patterns mentioned earlier. But now they are armed with evergelizing collateral in the executive gifts.

 Specific number of special codes that invite peers and colleagues (similar to the Gmail invite) to a password protected version of the current Holo website with event examples, registration and scheduling.

· HP - client branded USB jump drive with a high-fidelity interactive demonstration of Halo.











Rearing I from a troubled source. There's a small tight kell group of people who control the workt. This is a tip for word of much viral marketing possible control the workt. This is a tip for word of much viral marketing possible information in exchanged between and collisiopset. Agents in this social material have management responsibilities on a global state. They have a deep concern for traver such as:

\*borrelow with long and troublescome travel.

\*anonaging out and social-raising productively.

\*value chains from top to buildon.

\*value chains from top to buildon.

### **EXPOSURE**

### OWNERSHIP

### **EVANGELIZE**











# CHAPTER THREE: PERSUASION AND COMMUNICATION



### Persuasion within the organization

Design consultancies face difficult challenges if they wish to be considered as top-tier partners for the process of end-to-end product development. It is no longer enough simply to be creative. Product-design consultancies need to be able to communicate their creativity easily inside of a large organization, which requires a unique set of communication and facilitation skills. Creativity needs to be obviously and visibly linked to business value and technological feasibility, and the story of the design needs to be easily communicated to individuals who may not be familiar with discussing subjective topics like behavior, aesthetics, or appropriateness. Although product designers have long viewed themselves as storytellers, the focus of the narrative now must extend beyond the physical object to an interface, a brand, and ultimately the internal socialization process to drive consensus toward a given solution. Designers can no longer count on being present to sell their design solutions to skeptical clients or audiences—instead, various "User Experience" managers will likely evangelize the design inside of the corporation by themselves, and they need enough communicative ammunition to become designers-by-proxy.

### Persuasion outside of the organization

Design can be thought of as a form of communication not only within the organizational confines but also in a much broader sense: as a form of communication into society and with humanity. This does not imply that combining shapes into forms is like combining letters into words. Instead, a designer associates and embeds existing words into his design, which then becomes a proxy for the designer himself. This view of design language is the view of designer as large-scale persuader and characterizes design communication as rhetoric. This is discussed at length by Richard Buchanan in his "Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice."22 Buchanan explains that all forms of design encompass some aspect of argument. These are defined either by the individual designer's world view or design philosophy or by the overarching social world of design (which could be thought of as corporate policy or branding). As technology becomes more influential in pushing product innovation, successful design rhetoric—or persuasive language—becomes immensely important.

A product not only speaks but in fact attempts to convince—a designer makes an argument that comes alive each time a person considers her creation. Buchanan argues that designers cannot help but persuade and that technology is often used as smoke and mirrors to insert an empty dialogue. But instead of relying on the coolness of technology, form, material, and function can be successfully combined

Rhetorical argument implies a sense of purpose: "Indeed, design is an art of communication on two levels: It attempts to persuade audiences not only that a given design is useful, but also that the designer's premises or attitudes and values regarding practical life or the proper role of technology are important, as well."23 A designer may develop the next generation of cell phones, dealing with the physical form of the telephone, the material and manufacturing choices, as well as the software interface that a user encounters to perform calls. This designer's communication can be viewed on several levels. On a highly superficial level, it is possible to discuss the implications of using brushed aluminum and long, slender lines to illustrate a sense of futurism and references to technology in architecture. A deeper analysis might consider the usability of the phone—has the designer created a well-structured dialogue so the user and object can communicate efficiently and effectively? Finally, it is possible to consider the argument the designer has made by choosing to design cellular communication at all. She may be—implicitly, obviously—making a statement concerning the benefits technology has awarded society with rapid communication across geographical boundaries. Or the commentary may be considered more trivial: The designer may be simply stating that she Prefers to Make Cool Things.

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to create a cohesive argument. A pursuit of argument can be viewed as an attempt to shape someone's attitude. Design is to communicate, and this communication is not a monologue. It is a dialogue of persuasion, argument, and learning.

<sup>22</sup> Buchanan, Richard, "Declaration by Design: Rhetoric, Argument, and Demonstration in Design Practice," in *Design Discourse: History, Theory, Criticism*. Ed. Victor Margolin. The University of Chicago Press, 1989. p. 111.

<sup>23</sup> Ibid.

As another example of design rhetoric and argument, reflect on the form of a music-playing device. Specifically, picture a portable audio tape player. What does it look like?

Most will envision a similar—and archetypical—image of a square device with a clear panel in it. It is easy to picture the small spools upon which the tape twists, and this imagery allows an easy conceptualization of how the object functions. The cognitive accessibility of the device's functionality makes it predictable. In addition to simply picturing the item, most people—however technical—can form some sort of mental model of how the device works. This mental model may be technically inaccurate, but it allows for a quick analysis of the essential method of operation. The rhetorical stance taken by the designer (be it a designer at Sony or a designer at Aiwa) is probably going to be fairly similar.

This same sort of analysis can be performed with a portable compact disc player. Most people have a fairly clear understanding of the formal characteristics of a CD player that have been driven by the functional characteristics of a CD. The device is flat and roughly the size of the compact disc. Arguing that form follows function leaves little room for the individual aesthetics of brand (the color of the plastic or the placement of the buttons), but the general archetypical form resonates easily with the audience. A CD player is a CD player.

Now consider an MP3 player. What does it look like? A more difficult question may be: What should it look like? In this case, the pliability of digital technology affords huge leniency with regard to form, material, size, color, and weight. The designer is not constrained to follow a mechanically driven function and must instead make decisions based on external characteristics. An MP3 player can look like anything at all: It can be a square white box with radiused corners and a round click wheel in the middle, or it can be shaped like a carrot. The importance of persuasion—of convincing an audience that the MP3 player is

correctly designed—increases dramatically when functionality is nearly invisible. All too often, this rhetoric is left up to the advertisers, who may resort to brute force tactics of persuasion in loud television ads or huge billboards.

But argument, either through form or advertising, need not be loud. Would the iPod succeed without the subtle and refined dancing silhouettes reminding us that Apple has discovered the proper form for an MP3 player? The argument of this advertising campaign, combined with the care and

attention to detail of the physical iPod, has created a rather ubiquitous sign of what an MP3 player should look like.

### Designed artifacts identify an underlying culture

Designers Shelley Evenson and John Rheinfrank<sup>24</sup> established, through years of designing products and systems at consultancies like Scient, the Doblin Group, and Fitch, a theory of visual and functional product language. Like Buchanan, Evenson and Rheinfrank considered language as the strong connector between artifacts and people and discussed how design languages become a connector for how people experience products. services, and systems in the world around them. People do not simply use product form language—they live with it. Product form language is the basis for how people generate and interpret their surroundings. This has great implications for the design of mass-produced items. These items do more than simply provide a function or some form of functional utility. When viewed under the guise of language, these products become the fabric of society and allow people to express themselves, to communicate with others, and to shape their environment in unique ways.

Evenson and Rheinfrank were referring to the physical form, material, and visual style of an artifact. Digital products are generally more complicated than their analog equivalents, and so their physical and visual form alone may not be enough to offer a clear indication of use. It is difficult for people to rationally consider and analyze a personal video recorder because the form language of the recorder is often

### THE ART AND SCIENCE OF SOCIALIZATION

In many ways, the role of design in a corporation has shifted dramatically from one of craftsmanship—making artifacts—to one of facilitation—or driving an agenda. Designers find themselves operating in a space between project manager and consensus driver—and that's not a particularly creative or invigorating place to be. For those who end up in this role, the following may offer guidance to rekindle the creative embers that are beginning to burn out.

What you choose to socialize is as important as to whom you socialize it with—have an opinion of the work itself. Within a large corporation, anyone engaged in design, or UX, will quickly become the shepherd not only for communicating the work that has been designed but also to ensure that the work is at a certain caliber. This is a role of critique and criticism, and even if the work is produced by an outside vendor, agency, or partner, these groups require constructive criticism of the work itself and not simply of the correspondence of the work to some vague business requirements or technical constraints. Instead of positioning yourself as the intermediary between a production team of designers and internal constituents, which is the common and unfortunate role of the UX manager, consider how you can actually add creative value to the artifacts that are being socialized—either by adding to them directly or by pursuing a creative vision that is both aesthetic and conceptual.

Your role is not only to drive process and method but also to offer material expertise. The material, in the case of most digital products, is bits and bytes. Do you have enough of a fundamental knowledge of how bits and bytes work as to appropriately add material expertise? If not, how can you gain this confidence? This deep knowledge of the substance of digital tools and devices will reposition someone from a position of consensus generation to one of persuasion: You can argue for a particular idea, offering suggestions on how something could best be accomplished or how the material could be appropriately shaped to achieve an intended goal.

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<sup>24</sup> The late John Rheinfrank can also be credited with the definition of Interaction Design as accepted in this text. He was a principal at Doblin Group, an Executive Vice President at Fitch, and a professor at Carnegie Mellon University, Illinois Institute of Technology, and the Kellogg School of Management. He also began the publication Interactions, offered by the ACM, which is still the only notable publication discussing topics of Interaction Design without resorting to the more mundane and pragmatic view of Interface Design, GUI Design, or Web Design.

arbitrary—perhaps inspired by older, analog recorders or the whim of the designer. Form no longer has to follow or even relate to function, and so a designer has a new opportunity to relate a form to both emotional and social qualities instead.

This view is formally grounded in the study of semiotics. Semiotics is, literally, the study of signs. A sign need not be a printed object, but instead can include the theoretical understanding of the process of *signification*. By signifying something (or signing as a verb), humans can communicate meaning, and a sign itself is thought to carry some form of meaning. The sign (either physical or conceptual) uses various codes to help communicate the meaning and values embedded within it. A sign can be a visual element—like a street sign—but can also be the way one uses his body language or the sound pattern of words used to communicate to another.<sup>25</sup>

Ferdinand de Saussure is generally considered the founder of the semiotic movement. He considered language as a scientific and independent notion that could be separated from elements of culture or comprehension. Saussure believed that words are embedded with semantic meaning and therefore stand for other things—the word *chair* (in any human, spoken language) is deeply associated with the idea of sitting and the idea of the object that we sit on. The rules that make up the system become universally

more important than the application of the rules—that is, the notion of chairness exists whether or not we are using, considering, or speaking about a chair. One can consider and theorize on the nature of signs independent of particular usages or examples.<sup>26</sup>

If designed artifacts (such as objects like chairs or even complicated computer interfaces) follow Saussure's view of semiotics—and are thought of as signs rather than as simple physical and static elements of function—one can start to understand that the process of signification is deeply related to Interaction Design and the process of behavioral understanding in experiences. This might include the name of the object (often arbitrary—what does DVD player really mean?), the body movements necessary to manipulate the object (the sunken, pressable nature of buttons or the round and turnable style of a dial) or the proper way to consider an object ("I am a serious piece of consumer electronics. Do not play with me."). A sign, by definition, should be fairly universal and easy to understand. One should not require training to comprehend the message being communicated (in fact, semiotics frequently implies that users can't help but be affected by the process of signification—it happens automatically).

<sup>25 &</sup>quot;A linguistic sign is not a link between a thing and a name, but between a concept and a sound pattern. The sound pattern is not actually a sound, for a sound is something physical. A sound pattern is the hearer's psychological impression of a sound, as given to him by the evidence of his senses. This sound pattern may be called a 'material' element only in that it is the representation of our sensory impressions. The sound pattern may thus be distinguished from the other element associated with it in a linguistic sign. This other element is generally of a more abstract kind: the concept." (Saussure, Ferdinand de, Course in General Linguistics (trans. Roy Harris). London: Duckworth.)

<sup>26</sup> As if this isn't complicated enough, many notable contributors to the field of linguistics have subsequently critiqued this rigid notion that the structure of language can be separated from its use; contextualizing language seems to change meaning, as was pointed out by Valentin Voloshinov (Voloshinov, Valentin, Marxism and the Philosophy of Language (trans. Ladislav Matejka and I. R. Titunik). Seminar Press, 1973). Voloshinov felt that the "sign is part of organized social interchange and cannot exist, as such, outside it." Voloshinov theorized that the meaning of a sign is not as related to other signs but instead to the way it is used—to the actual context of use.

### The ethics of persuasion

It becomes clear that a view of design as rhetoric imparts a sense of power and authority in the designer, who is now in a position of control. In a sense, this is similar to the dissemination of propaganda upon an unwitting culture, and the horrifying events of Nazi Germany have been characterized as measured, particular, and exacting displays of design strategy, albeit for purposes of evil. 27 Because designers work with artifacts that are disseminated into culture en masse,, an argument is amplified and extended with a dramatic sense of reach. And, because the argument becomes part of the cultural landscape of all designed artifacts, the rhetoric of the designer is simultaneously extended and also diffused: the argument has a subtle, nearly invisible, immediate effect on the audience of consumers but in aggregate contributes to the powerful and tremendous level of cultural change that continually affects society. It's doubtful that any of us wakes up in the morning with the intent of manipulating culture, but that is precisely what our job entails—and perhaps we would be better off if we acknowledged at least the potential for our work to cause massive societal change.

This topic is explored in *Citizen Designer*, as represented by Steven Heller's introduction to the anthology: "A designer must be professionally, culturally, and socially responsible for the impact his or her design has on the citizenry." To recognize this vast responsibility is to understand two fundamental points. First, designers must realize that their work has a lasting and substantial

effect on the world. From the obvious effect of physicality so impressively visualized by a landfill, to the more subtle effect of attitudes, design work—good design work, bad design work—is always consequential, and therefore every design decision matters.

Next, and more important, designers must both realize and control the rhetoric of their designs. Whether the designer intends to communicate a personal message, a brand story, a political commentary, or simply an aesthetic contribution, designers must be cognizant of the argument that is being stated on their behalf, albeit frequently anonymously. This anonymity cannot act as an excuse; simply because designers are rarely named or associated with their products does not provide carte blanche to avoid the responsibility of the argument.

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<sup>27</sup> Death By Design: Science, Technology, and Engineering in Nazi Germany

<sup>28</sup> Heller, Steven. Introduction. In Citizen Designer. p. x.

# you're pretty so i want to be sure YOU hear

this...

# PART TWO: CULTURE AND RESPONSIBILITY



# CHAPTER FOUR: EXPERIENCE AND AUTHENTICITY



Designers are in the unique position to improve all aspects of human life, including the visual, emotional, and experiential. Interaction Design should be desirable—beautiful, elegant, and appropriate—regardless of the medium chosen to embody a solution. Visual form can be considered one of the most basic methods of communicating design solutions, and the associated field of Industrial Design has a relatively long period of formal development that can be directly applied to the creation of Interaction Design solutions.

While the roots of Industrial Design lie in mass production and the Industrial Revolution, the true essence of modern commercial design aesthetics can be traced to the styling exercises of vehicle designers in the 50s. Popularized by Raymond Loewy, the sleek, streamlined style of trains and cars can still be found in today's translucent plastic (and very fast looking) staplers, computer mice, and drinking bottles. Interaction Designers, however, are required to balance issues of form with issues of time: An interaction occurs in the fourth dimension, and simply attending to aesthetics does not take into account the unfolding experience that a user has with a product. Interaction Designers often find themselves in a position of imbalance between aesthetic appropriateness and the user-centeredness described above. Rhetorical issues of form development become increasingly important when considering solutions that embrace technology, as ambiguity of form may negatively impact understanding but may positively affect our experiences.

LEFT & RIGHT: TALKING CARD AUTOPSY

Basic digital-technological advancements have stabilized and begun to commoditize, resulting in cheaper, faster, and more effective capabilities. To see this influence in semiconductors, we need to look no farther than a \$2.99 talking Hallmark greeting card. This product exemplifies the opportunities and problems raised by Gordon Moore's 1965 landmark paper, "Cramming More Components Onto Integrated Circuits."29 Faster and cheaper digital technology has permitted digital experiences that feel less arbitrary (we are no longer urged to "download this driver, move this jumper") and more cohesive and seamless. The combination of technical quality and usability engineering has produced technology that works fairly well. This directly drives the change from artifact to experience.



29 Moore, 1965. Cramming More Components Onto Integrated Circuits.

### From Artifact to Experience

Product or Industrial Design's celebrated history of producing beautiful artifacts is intertwined with the roots of mass production and business. As companies such as Westinghouse and Braun made millions of dollars by producing numerous objects, designers such as Raymond Loewy and Dieter Rams helped to create a sense of human purpose for these objects in the home and workplace. Design as a discipline historically embraced the nature of this work, with product designers expected to envision and help to mass produce the objects. Designers would create prototypes in order to understand how an object existed in the round. An example is the clay 1/5- scale car models, built in half and balanced against a mirror to simulate an entire vehicle.

Farther into the product-development cycle, advertisers would investigate how to position the products in the marketplace. The so-called money shot—the beautiful image of the object, set on a white background and lit from all directions with soft lighting—became a method of elevating a simple mass-produced thing to almost an art object to covet and embrace. The declarative focus, both through the creative process and the sales cycle, was on the static object. The most celebrated designs of the twentieth century were bought, sold, used, and considered as "things."

This focus on things has changed, as product designers begin to explicitly emphasize both short-term and long-term interactions with the artifacts they make. The entire idea of a product has changed, and product managers or product owners in business find themselves in charge of the development of software goods, things that exist only on the screen, on the

net, or in-between. The emphasis in these products is on a larger story of use—on designing to support behavior—and on considerations of usability, time-based flows, and experiences. This change can be seen in all segments of product design, development, sales, and marketing. For example, consumers are enticed to purchase new electronic devices based on the experience of use, with an emphasis on the interface instead of the physical form. Although a television may still be sold primarily based on its price and screen size, more and more manufacturers are emphasizing the menu system, features and functions that a person will attend to during each use. And although product designers continue to examine form and material, they now spend most of the creative process on flow diagrams, use cases, usability, and other elements of interaction.

This change is evident beyond consumer electronics.

The push in the marketplace toward innovative experiences has created the common new acronyms of UX and UE—User Experience—with teams of people looking at the intersections between products and users. Equipment producers, sporting goods manufacturers, telephone service providers, and insurance providers and airlines have begun to analyze and describe the user experience of interacting with their products, services, and systems. This is a major change for all businesses, as people who previously focused on sales and marketing or production and logistics may now find themselves faced with the difficult and confusing task of creating pleasurable experiences.

### The Challenges of Experience

With such clear successes and value in structured experiences, it seems a likely conclusion to focus on designing experiences rather than designing artifacts (either digital or physical). But in moving from artifacts to experiences, designers face new challenges, challenges that are deeply rooted in psychology and philosophy and that require a more thorough intellectual consideration than may have been necessary in the design of physical objects.

Dr. Kees Overbeeke, an associate professor of Industrial Design at TU/Eindhoven, describes this meshing of object and experience:

In our work, we see design for usability and design for aesthetics of interaction as inextricably linked. Much of the Interaction Design community reasons from usability towards aesthetics: poor usability may have a negative impact on the beauty of interaction. This has led to a design process in which usability problems are tackled first and questions about aesthetics are asked later. Yet, we are also interested in reasoning in the other direction: working from aesthetics and using it to improve usability. We consider temptation to form part of an invitation for action, both through aesthetics of appearance and the prospect of aesthetics of interaction.<sup>30</sup>

As aesthetics and experience are so closely related, it is important to evaluate not only the emotional or experiential resonance in the creations but also to understand or contemplate the structure of experiences with artifacts. The most succinct and oft-cited structure for understanding user experience was authored in 2000 by Jodi Forlizzi, of the Human-Computer

<sup>30</sup> Overbeeke, Kees, et al. "Tangible Products: Redressing the Balance Between Appearance and Action," in *Pers Ubiquit Comput*, Springer-Verlag London Limited, 2004. With kind permission of Springer Science and Business Media.

Interaction Institute and School of Design at Carnegie Mellon, and Shannon Ford, formerly of Scient Corporation. Forlizzi and Ford, referencing John Dewey, identified the distinction between experience, an experience, and experience as story.

Experience itself occurs (probably continually) during moments of consciousness, as to experience the world or to consider what is occurring in the world at a given moment.

An experience has a beginning, middle, and end and can therefore be discussed and framed as a discrete experience in time.

Experience as story is the vehicle used to transmit, condense, and reflect on an experience.

In creating this distinction, the authors indicate that experience is something that occurs within a person, prompted by the nature of external events. An experience is something that positions less control in the person themselves, as they become more participatory in the process (just along for the ride). Experience as story shifts control back toward the person, as they can control the manner in which the experience is shared after it is over.

In all cases, the authors acknowledge that the creation of an exacting experience is, most likely, impossible in and of itself, and that instead, designers are more fruitful in focusing their efforts on the creation of the structure in which an experience takes place:

We can realize that a good product is one that offers a good or memorable narrative that the user will engage with, and pass on to others, either by sharing the artifact or by talking about it. To create a good product, it is critical to understand our users. The need to involve the user in the design process has made product design a more complex task. However,

designers can no longer focus solely on the product: a successful design will take into consideration all of the components in the user-product interaction: user, product, and context of use.<sup>31</sup>

Author, psychologist, and philosopher John Dewey explains that "Experience does not go on simply inside a person... Every genuine experience has an active side which changes in some degree the objective conditions under which experiences are had."

This implies that, while an Interaction Designer may focus on the creation of an artifact or system, much of the meat of the experience of use is left up to the person using the artifact or system.

The writing of Dewey, Forlizzi, and Ford is not simply provocative or theoretical; the philosophical idea of *individual* has pragmatic, real-world implications. Consider any two people entering Starbucks, on the same day, at the same time. Much of what they will encounter—much of their discrete experience—has been scripted, from what the barista will say to the temperature of the coffee that is brewed. But no matter how careful the designers were in positioning the lights and selecting the music and mandating the flavor of the rich syrup in the Caramel Macchiato,<sup>33</sup> the people who enter the store are unique, do unique things, react in unique ways, and think about the world from unique points of view. The uniqueness will frequently be inconsequential to the particular flow through the store, but sometimes, it will place a large amount of pressure on the designed experiential

<sup>31</sup> Forlizzi, Jodi, and Shannon Ford. "The Building Blocks of Experience: An Early Framework for Interaction Designers." DIS '00, Brooklyn, New York. Association for Computing Machinery, Inc. Reprinted by permission.

<sup>32</sup> Dewey, John. Experience and Education. Free Press, Reprint Edition. 1997, p. 39.

<sup>33</sup> A 16 oz Caramel Macchiato has 190 calories and 32 grams of sugar. Sixteen ounces of Coca-Cola classic has 194 calories and 52 grams of sugar.

framework. It doesn't matter if one of the visitors to the store has black hair and the other blonde, but it matters a great deal if one of the visitors has a food allergy or is unable to see over the counter, is shy, doesn't speak English, or has never been in a Starbucks before. A rigid, fixed experience that considers all people to be the same will clearly not work but neither will a common alternative approach: to try to hypothesize every possible thing that could happen and then design for all possible situations.

Some companies, like McDonalds, have scripts that their employees literally must follow, lest they are reprimanded or fired; some even have subscripts for less frequent interactions, scripts that "direct employees to say they will bend the rules 'just this once.'"<sup>34</sup> This may work in commoditized industries or services, where a rough approximation of successful service suffices (the hamburger I got roughly resembles what I wanted, and I only had to pay 99 cents for it, so even though I didn't

understand the ordering process and there are onions on the burger and I don't like onions, it's not the end of the world). But for most organizations, a rough approximation of success is not actually success at all. In situations like this, typical ecosystem strategy problems, where corporations desire uniformity in their offerings across but demand excellence in service and quality, designers have realized that control isn't always appropriate, possible, or desired. In these settings, designers find themselves focusing on frameworks, and these frameworks offer users a considerable amount of flexibility and leeway. The company must give up control, and this lack of control in design can be frightening, especially for the designer who is used to thinking of design as an expressive, personal, and highly finite activity (which is true for many trained in formal industrial or graphic design practices). They need to think about how to best design experience frameworks that can bend and flex with the unique needs of each person and the particulars of each situation.



As business owners and designers change to consider user experience, many realize they can imbue deep emotional resonance in their products and services. This desire to produce meaningful products is not new. For most of Industrial Design's history, designers have attempted to evoke emotions through the forms, colors, and materials of their products.

Yet many product designers have become frustrated with the superficial styling that is common in the creation of mass-produced artifacts. After engineering develops some technology and marketing specifies a number of features, the designer is called in to do the plastics or put a pretty face on it before the product goes to market. Designers continually bemoan the lack of integrity in this approach, as the late addition of design is seen as lipstick on a pig, and designers are implicitly viewed as lacking the intellectual capacity to create value in the item being produced. This change toward experience has given hope to designers. They now feel empowered to do what they have always wanted: to produce meaningful products that encourage emotional responses.

Experience, being emotionally resonant and memorable, intrigues designers. Humans are good at intellectually and emotionally remembering intricate details of experiences. Even bad experiences become deeply woven into our memories, as we recall—often with amusement— the time we missed the flight, or dropped the laptop in the pool, or set the microwave oven on fire. Years later, a bad product is not very funny, yet a bad experience, as a method of connectedness between people—experience as narrative—seems to age well with time.

Experiences have the deep meaning that product designers have long searched for, and it seems deceptively simple to change from designing things to designing experiences.

A simple fact has enormous implications for those who seek to design experiences: Human experiences are always unique. Even the most carefully crafted and planned event or interaction will always be slightly and subtly different because each person engaged in it is always slightly and subtly different. He may have awakened sad, for no reason; he may be a bit shorter or taller than was planned; he may do something unexpected, or he may make a mistake. The mass production of a physical product requires careful attention to tolerances, and the goal is efficient replication. Quality engineering methods are established to ensure that the product is exactly the same, time after time. Yet experiences are not the same, time after time. A focus on the mass produced ignores the subtleties of human behavior and human emotion.

To be more specific, and perhaps accusatory, now that product designers have gotten quite good at producing a predictable product, the game is changing: Designers are being asked to produce an experience that is positive and resonant but not necessarily predictable. Obviously, this is a more complicated problem, and to design it well is a more complicated endeavor.

### **Pragmatic Challenges**

In addition to the philosophical issues of semantics (claiming to design an experience may be a fallacy) and the aforementioned issues of control, the push toward digitally enhanced experiences presents new pragmatic challenges in software design and development for businesses familiar with physical product design and development. Many of these businesses may not be prepared for the difficulties introduced when changing from a producer of static artifacts to a supporter of experiences.

Although physical manufacturing enjoys a century-long precedent of trial, error, and exploration, software development is still in its infancy. Companies that intend to produce hybrid goods—both physical and digital—must revisit all of the qualityassurance issues they assumed were bested in the 80s, and relearn what it means to deliver defect-free products. Established but flawed methods for improving digital goods' quality and time to market are the subject of debate even within pure-play software companies (the most common argument is one positioning agile development against waterfall development, with people on both sides making compelling arguments but rarely achieving consensus). Many software companies find themselves using a patch-and-upgrade approach, offering software patches that fix defects found post release and upgrades that allow new levels of functionality. Consumers have gotten fairly used to upgrading their software products, but it remains to be seen whether they have the patience to upgrade their physical products, too. Some entertainment products have given glimpses of this future, as the Nintendo Wii frequently demands an upgrade prior to being used (and delaying game time considerably when the upgrade is

large). What will a forced update to a stove feel like? Will dinner have to wait for several hours while an update is installed? What will happen if users ignore the update, which they are sure to do? And what happens when the stove gets a virus?

Product managers, who are used to offering their product as a single, one-time purchase, will need to learn new skills and approaches. The connectedness of digital products implies a longer relationship with a consumer and demands flexible, pervasive, immediate, and friendly support and customer care. Just as consumers may be unwilling to upgrade their appliances, they may be equally unwilling to wait on hold with an offshore service representative when the upgrade to their microwave, blender, doorbell, or thermostat stops working.

A company that is used to producing physical goods in China in a relatively hands-off fashion will be stunned by the time and resources it takes to offshore the equivalent digital products. And a company that intends to produce a product that is both physical and digital will find an even tougher landscape of incompatibility, bug fixes, security, personalization, tooling, production, distribution, and support.

In addition to these pragmatic challenges related to product stability and quality, strategic challenges must be approached more authoritatively, from the top of the organizational structure. In emphasizing experiences, it becomes quickly evident that a single artifact is not used in isolation and that experiences span across objects and systems. A business unit in a large company cannot focus on a single product or product line any more, as there are experiential connections between one product line and another. The experience of lawn care will

switch quickly from mowing to edging to trimming to watering, and while different product teams at a household products company may have traditionally worked on each product line, customers expect products from the same brand to play well together. The people responsible for any given product must regularly communicate with people in other business units to drive alignment around a central, cross-product interaction.

This is easier said than done, as large corporations are commonly organized around narrowly defined product lines, where members of the development team have visibility only within a given product or set of products. If the compensation structure of a company reinforces an internal, siloed approach to product development, an individual has no direct motivator to explore competitive business units. And the same is true at an organizational level: If each business unit is responsible for their own profit and loss reporting, they are incentivized to close their metaphorical borders to other business units. Collaboration is fine as long as it doesn't detract from the bottom line. The result of this deeply verticalized approach to business organization on the visual and semantic experience of use is explicitly negative. The consumer has little chance of enjoying a cohesive and consistent set of interaction and aesthetic paradigms when using multiple products from a single brand and will have difficulty in transferring operational knowledge from one product to another. Most consumers have experienced how the brand breaks down when they try to get their camera to integrate with their printer. Even if both devices are from the same company, rarely is the device connectivity easy or seamless. The obvious

and notable exception is Apple, where the organizational structure is autocratic— devices work together because this level of brand continuity has been policed from the top down.35

Much as a brand is described and controlled through brand guidelines, interactions must also be unified, yet because interactions are subtle and diverse, a set of interaction guidelines (usually as a simple pattern library or unified taxonomy) is not enough to drive meaningful consistency. This challenge of driving unified and consistent behavior in multiple product lines is one that has few successful precedents, and those (such as Apple or Nike) are increasingly secretive about their internal, cross-vertical development processes. Many attribute these few successes to a heavy-handed creative visionary at the top of the company, which is unrealistic to expect in most of the Fortune 500 or Global 2000.

<sup>35</sup> Burrows, Peter. "Commentary: Apple's Blueprint for Genius." In Businessweek, March 21, 2005. <a href="http://www.businessweek.com/magazine/content/05">http://www.businessweek.com/magazine/content/05</a> 12/b3925608.htm

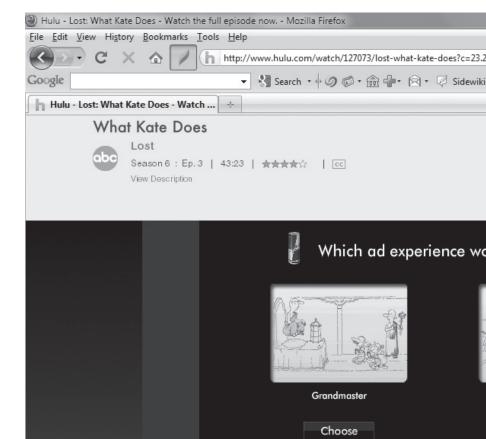
### **Owning the Experience**

The major leaders of the Fortune 500 have responded to these challenges of experience in various ways and with varying degrees of success. Many have changed their advertisements and brand campaigns to describe their commitment to experiences. For example, Dell intends to control the customer experience, as "Nearly every bulletin board in every office has a sign that reads 'The Customer Experience: Own It,' "36 and Hulu asks customers which "advertising experience" they would like, prior to displaying movies. Yet clearly the product landscape is not the utopia promised by these companies. Those that have reaped financial benefits from a focus on experience have changed more than just their PR; they've changed both the way their businesses are organized and the way they consider their products, services, and systems.

One of the most apparent changes evident in large corporations that are attempting to deliver emotionally resonant and personal interactions is the creation of an empowered UX group. Those who make up such a group may have no formal training in design, yet they have become the voice or the advocate of the user in the development of digital products. They work with external design consultants to balance both technical and business requirements and produce familiar documents: marketing requirements, product requirements, and specifications. The existence of a formalized UX group, and the placement of that group outside of either marketing or engineering, is a positive result of the aforementioned changes.

More important, these groups are engaged closer to the beginning of a development cycle to participate in initial strategic discussions and to drive product development activities.

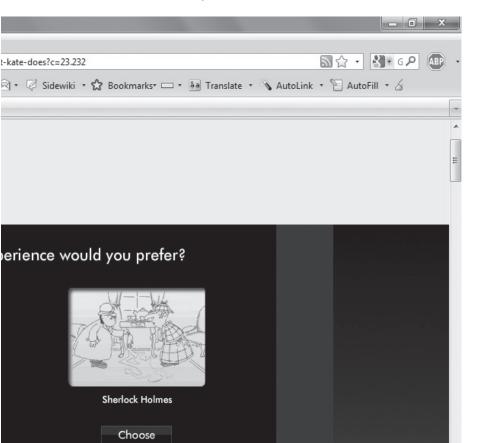
However, this centralized UX model is not perfect, and the strife between various business units is apparent inside even the most well-intentioned companies. UX professionals have been tasked with doing design work, yet they often lack the necessary training to do it well. Equally common, these people may lack the visual vocabulary to present their work in an emotionally resonant manner, so they become only conduits for outside vendors to deliver true design solutions. This is a frustrating position to be in, as it belittles



<sup>36</sup> Kirsner, Scott. "The Customer Experience." In Fast Company, September 30, 1999. <a href="http://www.fastcompany.com/magazine/nco1/012.html?1273395547">http://www.fastcompany.com/magazine/nco1/012.html?1273395547</a>

their role within the corporation and may actually position the UX group in a negative light: They may be seen as the "vendor management" organization or "marketing lite."

Additionally, because the members of a UX group typically come from either a marketing or usability engineering background, they lack a formal and methodical creative design process. The design methods utilized may be inconsistent and poorly documented, so they must be reinvented during each project or cycle. Or the methods have been inherited from traditional marketing efforts, and so these UX managers spend their time managing a marketing requirements document, product requirements document, or other flavor of overzealous documentation



that defines, in words, what features and functions the product will have or offer. Design certainly has a linguistic side, but a written feature document doesn't offer much in the way of visualizing the temporal qualities of experiences, interactions, or animations and transitions. These demand other representations, such as working prototypes, to be actionable and useful.

Regardless of the quality of the UX offering, however, the mere presence of this group in an organization implies that the organization is working to produce emotionally relevant products and interactions. Working hand-in-hand with a UX group, then, is the strategic push toward ecosystem design or the end-to-end product lifecycle. Companies are considering how brand loyalty can translate to an interconnected home or workplace, where the whole is greater than the sum of the parts. When all products that are developed by a single company can talk to each other, the larger world of those products provides an exponential curve of utility. This interconnectedness becomes a strategic method of ensuring repeat brand purchases (also known as *locking in the customer* or the more humane sounding *switching costs*).

Thus, we find ourselves at a place where major changes will likely benefit consumers, through increased emotional resonance of products, and will benefit businesses that are able to leverage the brand value of a cohesive, connected experience across multiple touchpoints. These changes have generated a number of difficult challenges and raise large questions about the nature of our organizational structures, our design processes, and the available talent pool of designers ready to face these challenges. The changes also indicate a lack of proper training, both for novice designers and for staff members who have stumbled into design through a trend toward UX within their corporations.

### **Authenticity**

In the past decade, brand experience has been recognized as a substantial and critical component to the world of product development. The rise of the mega-brands Starbucks and Nike has created a new set of rules for marketers. It is no longer necessary to spend each dollar of a marketing budget on the sale of product. Instead, large amounts of money are spent on raising brand awareness or gaining so-called mind share. Placement, messaging, stickiness, and experience are all marketing terms that have crept into discussions of product design and even into the design of interactive multimedia. Julie Khaslavsky and Nathan Shedroff have discussed the role brand plays in what they have deemed the Seductive Experience: "Ending a seduction successfully is like parting from a romantic relationship on good terms. It should always be viewed as a positive, worthwhile experience—if the creator of the product wants a chance at seducing the same customers again or being held in high regard for having created the experience in the first place."37 Scott Bedbury, author of A New Brand World (and creator of such memorable brand campaigns as Nike's Just Do It) claims several principles to understand and develop this seductive brand awareness. Not surprisingly, he concludes that "Relevance, simplicity, and humanity—not technology—will distinguish brands in the future."38

Recall the last time you enjoyed a cup of coffee at Starbucks. The store probably welcomed you with soft, subdued lighting; the warm and rich colors on the wall set a backdrop for the array of comfortable, oversized chairs and couches that surround the perimeter of the store. Before the barista welcomed you with a smile, the music playing complemented the physical experience with soft and often jazz-inspired rhythms. All of this, however, is trivialized by the rich and delightful scents of freshly brewed coffee and rich pastries.

As you approached the counter, you may not have noticed, and you certainly may not like, that you were being carefully manipulated to feel—and even behave—in a certain way: in the Starbucks Way. The colors, scents, process, procedures, placement, artifacts, heights, weights, materials, curves, transitions, forms, tastes, and products are all carefully orchestrated to ensure that you have a successful experience during your stay at Starbucks. A major theme of this experience is comfortable predictability, as the experience at a Starbucks in Portland, Oregon, is nearly identical to the experience at a Starbucks in New York City. The brand of Starbucks has transcended the simple mark or logo that is usually referenced to delineate a particular company. If prompted, you may even be hard pressed to describe the logo itself. Instead, when you next purchase a tub of Starbucks Ice Cream at the corner grocery store, you will recall the feeling you had when you last enjoyed a Venti Half Caff Latte with a biscotti.

Starbucks Corporation is not selling coffee as much as they are attempting to sell a predefined experience. When considering the actual product that is being consumed, the coffee begins to play a rather inconsequential role. In fact,

<sup>37</sup> Khaslavsky, Julie, and Nathan Shedroff. "Understanding the Seductive Experience," in *Communications of the ACM*, May 1999, Vol. 42. No. 5. p. 49. Association for Computing Machinery, Inc. Reprinted by permission.

<sup>38</sup> Bedbury, Scott. A New Brand World: Eight Principles for Achieving Brand Leadership in the Twenty-First Century. Penguin, 2003. p. 183.

Starbucks intends to become your home away from home. The 2004 Starbucks Annual Report explains that the corporation has the goal of becoming a third place for people to go—instead of home or work—where they can feel comfortable and, more important, loyal.<sup>39</sup> And it is not rare for a company to consider their business as a third place to go. Gap, Inc.'s Forth & Towne stores intended to create a welcoming place for middle-aged women to relax and unwind,<sup>40</sup> and Apple has also made an effort to sell experience: "One thing completely obscured from view as you enter the store: the cash registers. It feels more like walking into a hands-on museum than walking into a retail store. Sure, Apple wants to sell products, but their first priority is to make you want the products. And that desire has to begin with your experience of the products in the store."<sup>41</sup>

Starbucks also understands the importance of the seductive experience in generating return business. After creating the framework for a compelling and predictable experience, the product itself—coffee—is consistently top quality and unique, communicating the message that Starbucks is focused on the highest standard of excellence. This is communicated in totality, through happy employees (or so-called partners, who are eligible for such impressive benefits as a 401K plan for part-timers and full health insurance) and through total immersion of the Starbucks experience in the United States.

Companies try to tap into an emotional desire for resonance and try to appeal to the less logical sides of our decision-making abilities. The authenticity of the designed artifacts we encounter depends entirely on their craftsmanship and their intent and ability to evoke emotion. For mass-produced artifacts, these qualities become the substantiation of a claim by a company or brand. It's easy to see through an object that is false: The wood veneer will start to pull away from the cheap particle board beneath, the paint will scratch, and the finish will discolor. Age seems to highlight the charade of mass production, calling attention to inadequate production, cheap materials, and degrees of planned obsolescence. Unfortunately, we've grown accustomed to these inauthentic design choices. When the harsh reality of poor assembly rears its ugly head, we simply discard the object and buy a new one. Materialism and a consumptive culture have not just made a fool of our environment. It's become an easy way for us to avoid acknowledgment of the joke that's been played on us by the very companies that enticed us in the first place.

Designers at Starbucks, Forth & Towne, and Apple have explored the nature of experience and the role it plays in the creation of sales—they have focused their efforts on the experiences people have when they shop. The designed product is ambiguous, and it becomes difficult to understand the relationship between the physical and formal qualities of a product and the experience in which it is bought, used, or discarded. In fact, this distinction may be irrelevant. Interaction Designers do not consider a designed artifact as tremendously distinct from the context in which it is found.

<sup>39</sup> Starbucks 2004 Annual Report, p. 13.

<sup>40 &</sup>quot;It Sure Ain't Old Navy." Businessweek. October 17, 2005. <a href="http://www.businessweek.com/magazine/content/05\_42/b3955100.htm">http://www.businessweek.com/magazine/content/05\_42/b3955100.htm</a>

<sup>41</sup> Garrett, Jesse James. "Six Design Lessons from the Apple Store." July 9th, 2004. <a href="http://www.adaptivepath.com/publications/essays/archives/000331.php">http://www.adaptivepath.com/publications/essays/archives/000331.php</a>

#### THE "FLYING EXPERIENCE"

It's three forty-five in the afternoon, and the USAirways Flight 3912, nonstop service to Phoenix, has just been canceled. I'm sitting on the floor in the San Jose airport, with a laptop, a cell phone, and an overnight bag. Michael, my coworker, is sitting cross-legged next to me; other people are lying on the ground, a few in suits. Michael has somehow ended up talking to the USAirways representative on my cell phone, and I'm trying to navigate the USAirways website on his Blackberry. The people in the gate haven't figured out that the flight is canceled; the board is showing an hour delay, which will soon change to two hours and then to the useful CANCELED – SEE AGENT.

This particular flight, Michael learns from the agent on the phone, couldn't land in San Jose because it never took off from Phoenix. As he's placed on hold for the fourth time, a gate agent who looks like she's seen it all announces the grim news: The flight is canceled, there are a hundred fifty passengers who need to get reticketed, she's the only agent working, and will everyone just get in line and be quiet?

As we are getting reticketed for a Southwest flight the next morning, we are given compensation for our troubles. The gate agent gives us \$5 food vouchers for lunch and a handwritten check for \$523 and change. She explains that we are to present this to the Southwest ticket counter across the way, and they will provide us with a new set of seats. "Will they know what to do with this?" I ask incredulously. "Oh, yeah—it happens all the time."

Flying once had a shroud of technological magic draped atop it. The plane could fly! Like magic, we could soar through the sky! But as the technological magic wore off, standard capitalistic practices took over. Prices declined, consumer expectation grew, and the pace of commoditization overtook the rate of innovation.

Consider the lavatory of a typical Boeing aircraft. Consider the quality of the air in the plane. Consider the proximity of a stranger, or the volume of the announcements on the PA, or the paisley pattern on the carpet that is riddled with coffee stains and trail mix. This is the authenticity problem embodied: an industry that has clung to engineering and ridden the wave of a single technological innovation at the expense of design.

Some have become wise to the farce, and no amount of decoration can lure these consumers into the trap. They select only handcrafted objects of beauty, and they've learned to judge good design and honest labor. The physical is no challenge for these educated consumers, as they inspect the tightness of the joinery and marvel at the rubber coatings.

The authenticity problem is harder to acknowledge, however, when considering digital products, services, and the design of large-scale systems. What's been deemed the total experience of product, interface, environment, and service is the next frontier in the charade of authenticity. No longer is it enough to produce an artifact; it is argued that there is little intellectual depth to these items as compared to the design of a complicated and multifaceted system or service. Yet how can a consumer judge authenticity in something that isn't physical in the experiences they have?

Designers seek to support rich, compelling, and repeatable experiences, as this seems to be financially valuable and appears ripe with potential for innovation stewardship. Yet increasingly, it's becoming clear that mass-produced experiences can only rarely be consumed while maintaining any sense of realism: as the level of control over the experience becomes greater, the likelihood of the experience resonating with people decreases. This is the authenticity problem: Consumers see cracks in the designed façade of the experience touchpoints and begin to question the entirety of the branded experience. The authenticity problem rears its ugly head when the flight attendant is having a bad day, or the expensive meal is overcooked, or the football player is found guilty of using steroids. The mirage

of beauty and perfection and predictability is gone, and all that is left is the raw scaffold of an experience. With notable exceptions—the Apple Store or Starbucks—"lifestyle brands as experience" is generally a fallacy, and attempts to position brands as integral within culture are seen as less authentic than DIY, underground, or one-off experience scaffolding.

Truly authentic and rich experiences, however, occur every day. People's lives are filled with sorrow, ecstasy, serendipity, and other emotions that are drawn directly from the powerful narratives that intertwine in culture. These authentic experiences are supported by design but almost always in an indirect manner: A chance meeting between two long-lost friends in an airport is facilitated via the waiting area, but the waiting area is only ancillary to the meeting and certainly wasn't designed explicitly to connect long-lost friends.

Consider, then, that designers can focus on supporting authentic human experiences with their work in a less forceful, controlling manner. Rather than striving to control every aspect of a time-based set of interactions, and rather than attempting to shepherd people through a contrived set of experience gates, designers can support the authenticity that occurs naturally in life by producing incomplete or partially produced design artifacts. When these artifacts (both digital and physical) are encountered by people in the context of an experience, they will complete them, and this completion process is creative. Through this creative, time-based process comes a sense of temporal aesthetics.

#### Temporal aesthetics in experiences

The role of time in experiences, particularly in experiences that occur over an extended length (a week, a month, or even years) is difficult to track and understand, much less support through forms of design. However, anticipating key points of interaction that are likely to occur during those experiences can offer opportunities for interventions that establish a rhythm of design value. This rhythm comes from anticipating things a person might do. want, need, or desire throughout their relationship with a product, service, or system—and proactively servicing these wants, needs, and desires. For example, a company might anticipate the moment a customer is most likely to share her experience with someone else through a story or blog post. Or they may predict when a customer is most likely to have trouble with a service, such as when upgrading, downgrading, or moving. In both situations, design can be used to map and examine how customers might emotionally react to changes in designed artifacts due to product aging and obsolescence, and provocative stimulus can be offered to change the shift of a product experience.

Zappos, a company well known for its shoe delivery service, offers "surprise" free upgrades to overnight shipping for some customers and likely systematically plans these upgrades to be offered at the appropriate moments to delight a customer or to help improve a strained customer relationship. Many hotel chains frequently call customers after their stay to inquire about the level of service they received. These customer-service

<sup>42</sup> Mickiewicz, Matt. How Zappos Does Customer Service and Company Culture. In Sitepoint, March 30, 2009. http://www.sitepoint.com/blogs/2009/03/30/ how-zappos-does-customer-service-and-company-culture/

interventions need to occur at planned intervals in order to have the most appropriate and intended effect, and so they begin to establish the rhythm of the temporal interaction.

A holistic view of product interactions recognizes that there are touchpoints throughout the lifecycle of use, and while not all of these touchpoints immediately generate new profit, in aggregate they define the emotional response a person has to a design. While many consumer electronics manufacturers have recently focused on the out-of-the-box experience as a key point in the timeline of product interactions, there are other equally as critical moments to consider. Though not comprehensive, these include:

# → The point at which a product is most likely to fail. Car manufacturers are well aware of how long analog components, such as the timing belt, will last in a vehicle, and consumers are encouraged to have their vehicles serviced at certain points (10,000 miles, 20,000 miles, etc.) to best identify components that may be facing their demise. All products can benefit from this form of anticipatory analysis, and cheap computing and networking capabilities make it much easier for technological products to phone home to the original manufacturer and alert them of usage patterns or potential failure points. Known as back-haul data,

the data gathered from usage describe actual behav-



CAPTION: THE AUTHOR, HAVING AN "OUT OF BOX EXPERIENCE"

ior rather than expected or hypothetical behavior—as is the case with "data submitted by users through emails, phone calls, forum posts, and surveys." <sup>43</sup>

- → The point at which a user gains enough confidence to utilize advanced functionality. This is a moment where a user transitions from a novice state, and where his advanced usage of a product is likely to translate to a feeling of ownership and loyalty or, if his transition is negative, to rejection. The fragility of this moment can't be overstated, as the user is taking a personal risk by performing a complex function or trying a nonstandard feature or setting, and in doing so, she is exposing herself to feeling dumb or naïve. Consider if the product were able to predict when this type of change might occur, and act in a supportive and encouraging but not pedantic fashion; how might various language, affordances, and interactions change?
- → The point at which a person is most likely to share his personal experiences with other people, through stories, anecdotes, reviews, or even casual conversation. What if a device could sense that it was the topic of conversation and subtly remind a user of the value it has provided?

→ The point at which a person is most likely to upgrade the product (add functionality), downgrade the product (remove functionality), or maintain the product (perform a regular required, but tedious, operation). When a printer is out of ink, it could present more than just a blinking red light—it could explain where to purchase ink, offer specific ink model numbers, and give instructions on how to recycle old cartridges. While these are commonly opportunities to generate additional revenue, it's important to think of these moments as points in a conversation rather than points in a sales cycle. A long view of a customer relationship implies that it's OK if the user wants to downgrade the product or service or even disconnect it entirely. The conversation isn't over simply because the user has made a financial decision to part ways with the product.

Designers are in the unique position to improve all aspects of human life, including the visual, emotional, and experiential. Interaction Design should be desirable—beautiful, elegant, and appropriate—regardless of the medium chosen to visualize a solution. And while the aesthetic refinement is important to the success of a product, the ability of that product to resonate in an experiential manner will allow it to remain embedded in and positively affect society and culture.

<sup>43</sup> Miser, Tim. "Building Support for Use-Based Design Into Hardware Products." In Interactions Magazine, September & October, 2009. p. 58.

## CHAPTER FIVE: POETRY, SPIRIT, AND SOUL



One way of examining and considering substance in design is through a linguistic lens of poetry. An interaction occurs in the conceptual space between a person and an object. It is at once physical, cognitive, and social. A *poetic* interaction is one that resonates immediately but yet continues to inform later—it is one that causes reflection and that relies heavily on a state of emotional awareness. Additionally, a poetic interaction is one that is nearly always subtle yet mindful.

Consider the poetic and highly refined act of chopping a clove of garlic with a Wüsthof cook's knife, and compare it to the obvious, jarring experience of riding a roller coaster through the most perilous curves. The roller coaster drops and turns and relies on the adrenalin rush associated with near death. It creates an experience so riddled with awe that many will stop "thinking" at all. Each turn and drop is bigger than the last, and as riders feel the wind in their hair and the blood in their ears, the exhilaration is sensory and perceptual first and cognitive second, if ever.

By comparison, preparing a meal can be a rather banal experience. Imagine using the heavy forged steel Wüsthof, the blank of the handle against your hand, the staccato and constant motion of the blade against the cutting board, and the pungent odor of garlic pressing against your eyes and nose. This mundane experience described is a story that creates, much like a compelling novel, a world for the participant to engage in. Unlike

a novel, however, the participant is not an idle observer. The active engagement of the senses encourages a highly heightened sense of awareness<sup>44</sup>—the "user" is not simply a "viewer."

The roller-coaster forces a set of behavior through brute force and reminds the rider over and over that he is, in fact, thrilled. The knife, by comparison, speaks quietly but firmly. The interaction is at once less obvious and more compelling. The entertainment provided by the roller-coaster is passive in the most obvious sense—a rider sits, and his senses are assaulted. The entertainment provided by the knife is highly active, demanding a sense of acute engagement.

A poetic interaction can generally be characterized as having, or encouraging, three main elements: honesty, mindfulness, and a vivid and refined attention to sensory detail. These elements combine to encourage creativity in the end participant (note the shift away from the word *user*, as the audience no longer simply *uses* but instead must *actively engage*).

#### **Honest Interactions**

Honesty is a difficult word to discuss as applied to product development, as it brings to mind issues of ethics, morality, and the basic axioms of humanity. While the principles of life, liberty, and the pursuit of happiness resonate with Americans, these are ideologically Western views—thoughts of simplicity, respect, and nature may make more sense to the Japanese. Thus, while underlying and basic principles of integrity (do not steal, do not kill) may transcend cultures, the details of honesty seem to be culturally independent. Products that attempt to convey a sense of honesty may, in fact, not make any sense when presented in other cultures (and subcultures) and communities. Given that culture changes over time, honest product design, too, may begin to alter depending on the momentum of society.

All cannot be relative, however, if the attempt is to define a framework for poetic Interaction Design. If honesty implies integrity, Interaction Designers can uphold the integrity of several aspects of the design through the development of the product, and these particular aspects of honesty seem to transcend cultural boundaries: integrity to the business vision, integrity to the consumer, and integrity to materials.

Frequently, business decisions are made with a great deal of thought and consideration, yet the dissemination of these goals is thwarted by tiers of middle management that twist and convolute both the decision and the rationale for that decision. To uphold integrity to the business vision requires that Interaction Designers participate in the development of this business vision in some manner. How can one uphold the integrity of something if one isn't aware of what that something is? Internal corporate

<sup>44</sup> Don Norman discusses this in his text *Emotional Design* and makes a brief and fleeting reference to poetry: "Here is the power of storytelling, of the script, the actors, transporting viewers into the world of make-believe. This is 'the willful suspension of disbelief' that the English poet Samuel Taylor Coleridge discussed as being essential for poetry. Here is where you get captured, caught up in the story, identifying with the situation and the characters" (Norman, 125, reprinted with permission). This common link seems to connect the fields of poetry, cinema, and design. Understanding the poetics of Interaction Design, then, can hardly be an isolated undertaking. It must be interdisciplinary, and an Interaction Designer must be worldly aware.

branding, often represented as a set of strategic imperatives or as a set of goal-outcome statements, is used to disseminate business objectives internally. These statements are often an obvious attempt to force a value system on a set of participants who had little to do with the creation of these values. Iim Clemmer, 45 author of Firing on All Cylinders, claims that these imperatives are "those vital 12 to 18 month goals, priorities, and improvement targets that—when reached—hurl our team or organization towards its vision, value and purpose." Yet most involved in the development of products cringe when they hear a goal or priority broken down into a tongue-in-cheek euphemism like "Trim the Fat" (Albertsons) or into single, staccato-like bullets of "Imagine. Build. Solve. Lead." (General Electric). These miniature rallying cries rely on rote memorization and belittle the audience—they implicitly state that members of a company can't understand the complexity of business decisions and strategy.

Victor Margolin reflects that "Designer/entrepreneurs should be able to create business plans, identify niches for new products within the global marketplace, and seek appropriate venture capital." <sup>46</sup> If designers and artists truly understand why they are working on a particular project or direction, they can best embrace the strategic decision and hurl themselves at it.

This understanding of business value and strategy requires equal representation at the heart of business: A designer needs to be present in the boardroom where these decisions are made.

Integrity to the consumer, or participant, requires the passionate advocacy for humanity. This advocacy transcends "making things user friendly" or "foolproof" and instead requires respect for the end consumers and users of the product.<sup>47</sup> This respect comes from understanding and empathy and results in a level of commitment that often relies on the emotive instead of the rational. While design and manufacturing are engaged in forprofit activities, these activities should be ethical and informed. The entire notion of planned obsolescence rejects this notion of integrity for humanity, in that it attempts to pull the wool over the naïve consumers' eyes. Industrial Designer Brooks Stevens has been recognized as coining the term planned obsolescence. Consider the subtle audacity of his definition for this quality of design: "Instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary."48 With design comes a great deal of power. Rather than attempting to trick otherwise neutral participants in the dialogue of a product, why not exert this power toward the creation of betterment for the individual, her family, and her society?

<sup>45</sup> Clemmer is egregiously self-labeled as a "bestselling author and internationally acclaimed keynote speaker, workshop/retreat leader, and management team developer on leadership, change, customer focus, culture, teams, and personal growth." <a href="https://www.clemmer.net/excerpts/use\_strategic.shtml">https://www.clemmer.net/excerpts/use\_strategic.shtml</a>>

<sup>46</sup> Margolin, Victor. "The Designer as Producer." In Citizen Designer: Perspectives on Design Responsibility. Ed Steven Heller. Watson-Guptill Publications, 2003.

<sup>47</sup> It is interesting to compare the idea of Advocacy to that of Usability Engineering. Advocacy implies a human voice and a strong, active commitment toward betterment. Usability Engineering, on the other hand, frequently takes either a technical perspective or a business perspective, resorting to percentages of usability improvements or a cost justification for usability activities. Advocacy cannot be polluted by compromise, which is inherent in the embracement of technical or business rationale in justifying one's existence in the product development cycle.

<sup>48</sup> Adamson, Glenn. Industrial Strength Design. How Brooks Stevens Shaped Your World. MIT Press, 2003.

Integrity to materials requires a sense of respect for both the natural world and the human-made world, and the philosophical understanding of how various materials want to work. Consider a PT Cruiser with wood paneling (wood laminate, a thin sheet of wood or a wood-like material) on the side. The car is made of metal and plastic, and is artificial in nearly every way (even in its allusions to early Sixties wagons). According to Chrysler, it is the "small car alternative that lives large." Why, then, would a designer specify a choice of "a simple, flowing wood-grained graphic" on the doors, the graphic being "a linear Medium Oak woodgrain framed with Light Ash surround moldings"? The car isn't wooden, and in this case, the wood isn't even wooden! Trevor Creed, Senior Vice President of Design at the Chrysler Group, attempts to explain that "For the Chrysler PT Cruiser 'Woodie' Edition, we wanted a design execution that recreated the carefree fun of the popular 1960s California surf wagons."49 But the popular California surf wagons, specifically the Mercury Station Wagon, were made of solid wood. The 1946 Mercury Woodie was made of a solid wood frame (most probably birch or mahogany), as were many vehicles in the late thirties and early forties. If a car is going to be made of wood, it should deserve to be made of wood. What type of design deserves to be made of a "wood-grained graphic"?

One can't help but think of the idealistic Ayn Rand's Howard Roark as he denounces the Parthenon as poorly architected: "The famous flutings on the famous columns—what are they made for? To hide the joints in wood—when columns were made of wood, only these aren't, they're marble... Your

Sustainable Design advocates William McDonough and Michael Braungart illustrate a similar respect for materials and the associated principle of honesty in design in the physical manifestation of their text *Cradle* to *Cradle*. The pages of the text are made of plastic rather than paper. The ink from the pages can easily be washed and captured for reuse. The plastic itself can be reused without downcycling. As McDonough wondered aloud during the Industrial Designers Society of America annual conference in Washington, DC, in 2005, "Why make something as simple as a sheet of paper out of something as elegant as a tree? Design something that makes oxygen, fixes nitrogen, builds soil, provides habitat for hundreds of people, and self replicates... and cut it down to write on it?"51

Greeks took marble and they made copies of their wooden structures out of it, because others had done it that way. Then your masters of the Renaissance came along and made copies in plaster of copies in marble of copies in wood. Now here we are, making copies in steel and concrete of copies in plaster of copies in marble of copies in wood. . . . "50

<sup>49</sup> Creed, Trevor. September 20, 2001. Press release.

<sup>50</sup> Rand, Ayn. The Fountainhead. Signet, 50th Ann. edition, 1996, p. 24.

<sup>51</sup> McDonough's quote is taken from the IDSA keynote address in Washington, DC, although he has made this point in many other talks as well.

#### **Investigating mindfulness**

In addition to the elements of honesty, a poetic interaction should encourage a state of mindfulness. Mindfulness (note the subtle distinction between mindfulness and mindlessness) has often been cited as the primary state of mind necessary to accomplish meditation. Buddhists reference a state of mindfulness of breathing. One can think of mindfulness as an acute awareness of the present moment. 52 Rather than actively considering other people, or chores that need to be done, or opinions that need to be formed, one simply exists, and understands this moment of that existence. This appreciation for the present moment has been cited as a method used successfully by marathon runners and artists alike and discussed by authors such as Ralph Waldo Emerson and Walt Whitman.

A successful poetic Interaction Design will encourage a state of mindfulness. This is, of course, easier said than done. To achieve this state of mental appreciation, one must be willing (and actively choose) to ignore many of the problems and elements present in the hustle of daily life. How can a product encourage a user to let go of his surroundings and attend only to the moment?

When reading a poem, it is interesting to consider where the imagery comes from. The words on the page are rather plain, and save for the authors' potential use of kitschy typography, the print itself is rather nondescript. Words themselves frequently fail to trigger vivid and robust thoughts, as the brain seems to desire to think in two dimensions. That is, even when trying passionately to picture a "tree in the rain," few readers will get beyond the prototypical form of a tree—the form that, perhaps, a child will scrawl when asked to draw a tree. This lack of ability to visualize an object in full detail in the mind may be what holds many back from claiming artistic capabilities. "I can't draw" usually means "I can't draw accurately," and it may be more appropriate to claim "I can't think" (or at least "I can't think accurately").

But compare the imagery conjured by a "tree in the rain" to this short excerpt from "The Wasteland":

April is the cruellest month, breeding Lilacs out of the dead land, mixing Memory and desire, stirring Dull roots with spring rain<sup>53</sup>

T. S. Eliot has managed to use the same basic constructs of words, and simple words at that, to stir deep emotional responses in the reader. A "tree in the rain" is finite, obvious, and non-challenging. The lack of complexity and specificity may, in fact, be why it is difficult to picture the tree with any depth or detail. But the fact that the lilac has dead roots, and it isn't just a rain—it's a *spring* rain—creates a matter-of-fact situation that readers can begin to feel before they even try to see it. It is difficult to picture April, much less to picture

<sup>52</sup> Author Jon Kabat-Zinn offers a more poetic description of mindfulness in his book Wherever You Go, There You Are: "Mindfulness means paying attention in a particular way: on purpose, in the present moment, and nonjudgmental. This kind of attention nurtures greater awareness, clarity, and acceptance of present-moment reality. It wakes us up to the fact that our lives unfold only in moments." Copyright © 1994 Jon Kabat-Zinn; reprinted by permission of Hyperion. All rights reserved.

<sup>53</sup> T. S. Eliot, "The Wasteland."

the month as cruel, yet Eliot's four lines have managed to invigorate a deeply honed sense of feeling that allows readers to picture not just a tree, nor a rain, but an entire scene.

In much the same way that readers have difficulty picturing a "tree in the rain" with any level of character, they may have a similarly troubling time imagining opening a car door, or turning on the television, or typing an email. Simply recalling the nature of interactions one has had throughout the day is a particularly difficult task, in a peculiarly striking way. As an example, try to imagine how many doors you must have opened, how many buttons you have pressed in one day. Surely there were a lot, but recreating these actions or recalling particulars is incredibly difficult. It may be difficult to reproduce these ideas because they happened, for lack of a better word, automatically. It is not necessary to consciously attend to the car door when encountering it. Your focus was most likely on the destination of the drive or the other passengers in the car. Most will recall actual behavior only when it fails. It is easy to recall when the door broke, or when a key was lost, or when a door was difficult to open.

Frequently, resonant interactions are creative interactions with a heightened awareness of task. Author and psychologist Mihaly Csikszentmihalyi has been analyzing the essence of creativity and has identified the state of being known as *flow* to be one that encourages a vivid awareness of the moment but an almost lack of awareness of the surrounding environment and task. As Csikszentmihalyi describes, during flow,

the sense of self and self-consciousness disappears. While experiencing flow, people become too involved in their activities to worry about protecting their self-image or their ego.<sup>54</sup>

Perhaps, then, it is useful to attempt to recall not a particular interaction but the beauty of the associative scene. In the same way that a poem requires a sense of whole in order to understand the parts, so too does a successful interaction require both a holistic attention to the context and a dramatically detailed understanding of nuance.



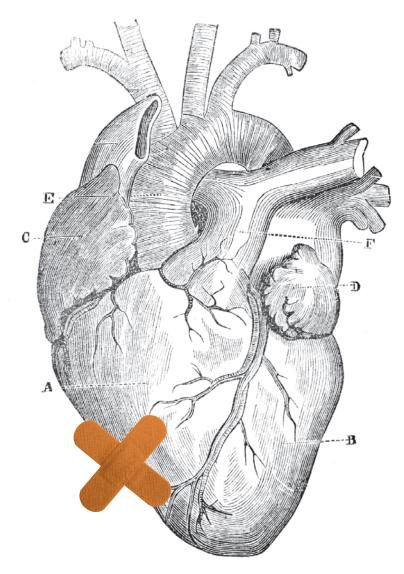
54 Csikszentmihalyi, Mihaly. Creativity: Flow and the Psychology of Discovery and Invention. HarperPerennial, 1997, p. 112.

#### **Attention to Detail**

In addition to honesty and mindfulness, a vivid and refined attention to sensory detail can be thought of as the last necessary element to encourage a poetic and resonant Interaction Design. This attention to sensory detail—made up of all elements of design, including material, form, color, texture, placement—is frequently lost during the translation from concept to reality in the actual development of manufactured goods. Two main explanations can be cited for the loss of this important quality: an understanding of importance and cost. Often, the folks working in product development don't understand, respect, or care about attention to sensory details. Many engineers and business executives have a difficult time embracing the subjective benefits of one material over the other. This is not to say that engineers and executives don't care about all details; indeed, to achieve a level of Six Sigma quality, engineers must be detail driven. 55 But these details are in logic and in process rather than in the visual or the aesthetic. Many engineers simply have not been trained to perceive these details. Those who have designed computer interfaces can attest to the blinders software developers have toward visual style. To many developers, the user interface is an inconvenience that commonly implies drastic compromises and delays in development. It is not accidental that one can achieve a B.S. in Computer Science at Carnegie Mellon University and never take a required user interface development course. The design of visual control interfaces are relegated to an elective.

Additionally, issues of cost frequently disrupt attention to sensory detail. In the development of a physical product, designers may specify very particular trim pieces or premium surface treatments. These details will help differentiate a product in the marketplace and will serve to create a cohesive experience of use, but will also add cost to the development of the product. In a business culture, the value of these particular ephemeral enhancements may simply not be comprehensible to the managers making financial decisions. These details are at the heart of popular industrial design successes like the Apple iPod, the Motorola RAZR, and the Audi TT. Imagine the iPod in a cheaper grade of plastic or the TT without the hallmark—and more expensive—art deco gauges and custom leather interior. Companies like Apple and Audi continually understand and respect attention to detail in visual aesthetics and frequently pass on the cost of this refinement to the consumer, who will happily pay the premium price to enjoy the premium experience. To resonate poetic, the interaction one has with a product should be engaging, appropriately complicated to the given task in order to encourage a mindful state, and highly sensory. But it is important to note that the moment need not be long. While pouring a cup of coffee out of a French press, one may experience a mindful interaction, if only for several seconds. The combination of acuity necessary to perform the task (the challenge, if you like, of successfully moving the hot coffee from one apparatus to another) and the appropriate materials (stainless steel, glass) and the various sensory elements (the smell of the rich coffee, the heat against the pouring hand, the billows of steam from the bottom of the coffee mug) creates a poetic interaction.

<sup>55</sup> Six Sigma is a quality management program that originated with Motorola; the program attempts to measure and reduce defects in the mass production of products.



Some practicing designers balk at the idea of designing poetic interactions. One early reviewer of this text was as blunt as to say, "I have other things to worry about—like shipping a working product that isn't awful." Yet if designers focus only on the low-hanging fruit of functionalism or usability, the human experience with designed objects is destined to a level of banality. As ideological as it may appear, what if that piece of enterprise software offers—for a fleeting moment of use—a poetic or soulful experience? These types of interactions extend the view of design as communication, building on the view of argument, rhetoric, and design languages. Poetry specifically, and language generally, provides a framework in which to view interactions created through design. These interactions, when properly structured, can afford sensory, emotionally charged, and breathtakingly human interactions.

# CHAPTER SIX: JUDGMENT AND SHIFTING NEGATIVE BEHAVIOR



#### **Usability and Influence**

A norm is an accepted behavioral pattern that's learned and that helps dictate what is appropriate and normal behavior within a specific culture or group. Often norms take the form of unwritten and unspoken rules—the guidelines that help us understand how to behave. A group may decide (used loosely, as these decisions often occur over time and without conscious discussion or debate) that it's acceptable to speak loudly on a mobile phone in a closed space, like a train or bus. This then becomes the cultural norm, and those who don't participate in or appreciate the norm may find themselves in a minority when voicing objections or disagreement.

Norms are communicated through societal interactions, including conversation, body language, and other forms of group interactivity. Increasingly, norms are communicated and disseminated by people using technologically advanced devices, resulting in the mass transfer of a form of iconic norm representation—a meme—that helps explain cultural communication and dissemination.

Most cultural critics agree that norms and memes occur naturally and spread in a similarly organic way. But Interaction Design, as the design of behavior, can contribute to, shift and shape, and even help to control the normative frames that describe cultural change. As an example, consider the gradual 20-year-long shift toward acknowledging usability as an important part of activities, from approximately 1985 to 2005. Designers focused on usability would strive to decrease cognitive dissonance, emphasizing speed and decreased time on task, with a goal of minimizing the number of errors a

user might have while using a complicated system. This view grew out of a culture of software development that embraced complexity and that emphasized features and functions instead of coherence and comprehension. And this cultural shift advanced at least two cultural norms. First, a cultural acceptance of usability helped advance the behaviors supporting technological exploration. People learned that technology is not fragile and that some degree of haphazard user-exploration with a computing system will not result in catastrophic error. Second, a cultural acceptance of usability slowly began to shift the view of technology as a special thing that only engineers could control. As it became culturally acceptable for regular people to utilize computers and even write software, traditional stereotypes of geeks and nerds have begun to break down.

But for many designers, the focus on usability is the entire extent to which a philosophical methodology has been established, and usability has become the single value these individuals add to a given design problem. Yet there is more to design than usability, and there is more value a designer can bring than simply making an artifact easier to use. In many respects, and given the critical role assumed by designers in culture, there is a larger form of active judgment and criticism that can be produced in the context of a specific design problem, and in particular cases, this judgment and criticism must be produced. This judgment and criticism shift the role of the designer from one of an objective participant in a discrete design exercise to a fundamental and pivotal force in the creation of meaning.

Consider, by way of example, how a single designer of a single mobile phone interface forces a cultural judgment in the design of even a single interaction. The designer, working on a phonebook application, has already embraced particular design themes. In this particular case, the phone's thematic essence was to be a social conduit that takes advantage of new communication paradigms; the company that produced the phone wanted to take advantage of the growing trends toward social interaction design and various social networking capabilities. The designer is now performing a fairly utilitarian design activity—putting together example screens (wireframes) of how a user would interact with the phonebook application and specifically, what action would be the primary action when the user selects one of his friends or family from a list in the phonebook.

A usable solution would look at what people expect based on prior phone use and would marry this information with data related to the specific context of use. The solution would probably be to emphasize the Call button as the most prominent action a user can take. Indeed, this is what most phones offer after selecting a contact. Some, anticipating this action, even start the call directly when selecting the contact, without an intermediate menu to offer actions at all.

But in this particular example, the designer refers back to the central theme of the phone—that the phone is to be a social conduit and that it is to take advantage of new communication paradigms. The designer's interpretation of this is to emphasize new media activities and actions, such as Send Text Message or Contact via Facebook, and so the rather banal design activity of phonebook primary action

becomes trickier with a lot more interesting decisions to make. What if, for example, the primary and default action after selecting a contact (and the largest action, the one at the top of the list) is Mention This Person in a Tweet? Put aside for a moment the specific use case of making a call, and consider what role the designer's judgment plays in this decision.

The designer's personal design philosophy, combined with the larger thematic nature of designing for social interactions imparted by the client, begins to compete against the traditions and norms of usability and even challenges the tendency toward common sense. What if the designer purposefully makes voice calling hard? What if they remove calling functionality completely (is the phone still a phone?)? What are the ramifications on the types of things a user will do with the phone, and how will those actions change the nature of modern human life?

The designer makes the above decision, emphasizing Twitter (a public form of communication that facilitates one-to-many communication) over telephone calling (a private form of one-to-one communication); the phone is produced; two million units are sold; for each of the millions of calls that would have been initiated each day, the users now are encouraged to tweet publicly instead. And now, with a single design decision on a single screen

on a single phone, the designer has affected culture dramatically and massively, essentially inverting the established norm and making the phone a public, communal, and social device.

Arguably, the designer has made calling more difficult and has sacrificed the usability of phone calls for the cultural prioritization of public communication. Some people may not like the decision and will continue to make phone calls—and will bemoan the poor usability of the phone. But others may embrace the decision, slowly altering their behavior to make voice phone calls with less frequency than using Twitter. And this behavioral change, prompted by a design that is mass produced for millions to use, will swirl through the human-built world with incredible consequences.



#### Judgment, frames, and ethics

Design serves as a cultural backdrop for our world. A designer makes subtle decisions that individually seem insignificant, yet each decision is amplified in scope as they are released into society en masse. These decisions have a delayed impact, as they reach the marketplace months or even years after they are made in the design studio, and so it becomes difficult to map a cultural shift to a specific design choice.

**Scope amplification.** Through mass production, detailed design decisions that are made in the design studio are then propagated throughout the world in mass quantities, affecting thousands or even millions of people. The entire value of mass production is in its exacting ability for identical duplication and in the ability for decreased cost of production by leveraging economies of scale. In this way, the voice of the designer is amplified often by millions as their creative activities are duplicated and advertised in culture. A single design touches millions of people.

Invisible manifestation. Consumers have the ability for choice, and all people are relatively autonomous. Yet behavioral change happens subtly, and most people rarely have the time or awareness to understand how a complicated product is affecting their life. An oft-discussed example of this invisible manifestation of design decisions is found when examining how privacy settings in a social network like Facebook have long-term and unexpected consequences. For example, a survey funded by Microsoft of HR professionals in the United States found that "the top online factors for rejecting a job applicant are unsuitable photos/videos, concerns about a candidate's lifestyle and inappropriate comments written by the candidate [on a social networking

site]." <sup>56</sup> In this way, a designer can encourage a user to take actions that have deep and meaningful implications on their lives, yet the user may not be fully aware of those implications.

**Delayed.** A designer makes a variety of design decisions while creating a new product, and for most products, there is then a delay as the product goes through a variety of completion gates (including quality assurance, deployment, production, or distribution). This is true of both physical and digital products, and the gap between a finished design and availability in the marketplace can stretch to a year or even longer. This means that ideological and philosophical paradigms that influenced the design may have changed, and the world's social, political, and economic situation most certainly changed. Yet the old design decisions are still introduced into the world, with all of the behavioral implications already discussed.

**Diffused**. A product is one of thousands or millions of things that affect a person's behavior, and a single product joins social norms, genetic predispositions, and various external influences in shaping the way people act, behave, and make decisions. It's nearly impossible to indicate a causal relationship between a design decision made in the creation of a product and the way a person acts in real life, yet there's most certainly an association between these activities. In this way, the designer's voice becomes muffled and diffused, and the designer acts more as a shepherd than an authoritarian force in shifting the way people interact with products, systems, and services.

<sup>56</sup> Ingram, Mathew. "Yes, Virginia, HR Execs Check Your Facebook Page." GigaOM, January 27, 2010. <a href="http://gigaom.com/2010/01/27/yes-virginia-hr-execs-check-your-facebook-page/">http://gigaom.com/2010/01/27/yes-virginia-hr-execs-check-your-facebook-page/</a>

It's necessary, then, to offer a framework for creating ethical design judgment in the context of a design problem and in the larger context of design methodology. This framework would balance the subjectivity of culture with the objectivity of a human responsibility and would describe ways in which larger decisions can be made.



#### **Rejecting Usability**

Usability is usually associated with decreasing the time necessary to complete a task (and increasing efficiency), decreasing the time necessary to learn a new interface, or reducing the number of errors. Usability engineering commonly recommends a reduction of cognitive load, and seems to encourage the creation of "mindless" interfaces that simply don't require a great deal of thought to operate. Consider the cliché reference to "user friendly" as a means to describe computers: Poetry, even the most humane and beautiful, is rarely considered by the masses to be user friendly.

This is not to say that usability is not important. On the contrary, if one cannot understand a creation, this creation certainly cannot allow for a state of mindfulness or encourage creativity. However, in order to realize the state of awareness described above as critical to mindfulness, an element of challenge must be present. The pursuit of a creative solution is not an easy activity, yet the difficulty—the sense of accomplishment that occurs when completing a difficult task—can be thought of as one of the main attractors to participants in the design process. Striking the balance between usability and challenge is a difficult task informed by both experience and intuition. The poetics of art begin to clash dramatically with the fundamental need for usability, and future designers will need to make conscious choices of which to give primary importance.

There is more to life than usability. Few would characterize their marriage or friendships as usable—in fact, blatantly mean or hostile interaction paradigms may be a richer method of communication than the commonly accepted norm of efficient

or foolproof. This is not to say that interfaces should be mean; it is simply to imply that interfaces must move beyond the baseline of usability for the simple fact that usability is boring.

Kasimir Malevich learned to paint in a postimpressionist technique prior to creating a white square on a white canvas; his ultimate goal, to free art from the burden of the object, was embraced only after understanding how to visualize the object in reality. So too did Pablo Picasso master proper technique before embracing the abstraction of cubism. Like other artists, these pioneers learned the fundamentals in order to reject them. We must understand usability in order to discuss the rejection of its principles. A naïve application of this text would be a blind rejection of all principles related to efficiency; that is not the goal. Instead, the synthesis of usability principles with the other elements of a true user-centered design process are necessary to accurately create complicated Interaction Design solutions.



#### **Discursive Design**

As it becomes apparent that the abnormality of a consumptive culture has introduced challenges and unexpected social and economic consequences, a growing area of cultural criticism has formed around design activities. This area of criticism is intended to provoke thought on the postindustrial world we've created, but the work, taking both the form of literary criticism as well as a new form of discursive design, does not act only as a simple layer of commentary. In the same way that artists respond to art criticism, so too do designers respond to design criticism, creating a dialogue related to human behavior and technology and offering criteria upon which to build design judgment.

Discursive design is defined by Stephanie and Bruce Tharp as "a category of product design that treats artifacts principally as transmitters of substantive ideas, rather than as mere instruments of utility." <sup>57</sup> Of course, at some level, all products are transmitters of substantive ideas, and so a more robust definition might be "a category of design that is primarily intended to provoke public dialogue." That's quite different from the typical goals of provide utility, generate revenue, or be aesthetic, and it positions design as a deeply culturally significant activity. The seemingly simple idea of shifting the goal of a product from utilitarian to conversational begins to describe how products can act as props in the larger context of our world, playing different roles at different times and supporting human behavior. It

<sup>57</sup> Tharp, Stefanie, and Bruce Tharp. Discursive Design. <a href="http://www.discursivedesign.com">http://www.discursivedesign.com</a>

shifts the role of the designer from form giver, problem solver, or even public servant to provocateur—one that exists to cause others to question, to ask why, and to pursue reflection.

Allan Chochinov, who runs the design site core77, is a proponent of discursive design as a way of getting designers themselves to reflect on their profession and their work. As he describes, "While many artifacts are necessary and desirable, they need to be appreciated in their larger context; they are usually part of a greater whole. Many products are props in an experience; others are necessary tools to accomplish work or tasks; still others are totems or beloved objects. Some are just plain beautiful, or coveted, or disposable. In almost all of these roles, however, a product has just that—a role. And these days, with a greater appreciation of the consequences of mass production, the labor implications, the fuel, energy, and pollution in transporting goods back and forth around the globe, we need to be sure that when we tool up to manufacture something we're not doing so blindly, we have thought about the role of that artifact, and we have considered whether that role can be fulfilled in a more sustainable, local, respectful and humane way."58 The provocative nature of discursive design serves to show how things might be, could be, or desperately should not be. And in creating these solutions, designers actively change the role of the user from consumer to thinker.

SMSlingShot is an example of such discursion. The project takes the form of a public installation and allows users to add digital graffiti to large buildings by slinging the content onto the

Adbusters is an example of an organization that continually uses this form of discursive design—often embodied in anticonsumerist mock advertising—in order to advance the discourse of an advertising-activism culture. They describe those engaged in discursive design as "culture jammers" and define the process as "critiquing mass media messages and their influence on culture by subverting their messages through artistic satire." 50

When viewed through a lens of norms, memes, and discursion, it becomes apparent that designers help shape culture. Is it fair for us to claim success when things are going well? And much are we to blame when things go awry? We can shirk the responsibility and blame the media or the parents. After all, the whole of culture must be shaped by external forces. But if we truly consider the makers of culture and think critically about the shapers of our society, we find that the designer plays a role of utmost importance in dictating the future. A person is motivated to buy a specific item based on price, or utility, or function, or style. These attributes, integrated as a whole, speak of the value structure that the individual claims and integrates into his existence. Consumers often construct their place in

side of the walls. The designers explain, "Because of the increased commercial interest of paving public space with digital advertising screens the need for an accessible intervention device seemed obvious and necessary... People shall not only remain as a passive audience, they must obtain the privilege and beside that the right tools to create their own multimedia content in the streets." 59

<sup>58</sup> To Design or Not to Design: A Conversation with Allan Chochinov, by Steven Heller, February 17, 2009, AIGA.

<sup>59</sup> VR/Urban, SMS Slingshot. <a href="http://www.vrurban.org/smslingshot.html">http://www.vrurban.org/smslingshot.html</a>

<sup>60</sup> Binay, Ayse. Investigating the Anti-Consumerism Movement in North America: The Case of Adbusters. 2005. Unpublished dissertation.

the world through the products they buy, exhibiting a sense of individualism and manufacturing their sense of identity through their selection of brands and products. But the totality of these consumers is culture, and as already stated, the designer of products is a designer of culture. If we are to claim the victories of cultural resonance, we must also accept the blame and inherent responsibility that comes with such a critical role.

#### What We Choose to Design

Nicholas Negroponte, founder of the One Laptop Per Child initiative, has an optimistic view of our technological culture that is summarized in the epilogue of his text *Being Digital*: "Bits are not edible; they cannot stop hunger. Computers are not moral; they cannot resolve complex issues like the rights to life and to death. Being digital, nevertheless, does give much cause for optimism. Like a force of nature, the digital age cannot be denied



or stopped. It has four very powerful qualities that will result in its ultimate triumph: decentralizing, globalizing, harmonizing, and empowering".61 This view of technology as a positive force of change is uplifting and perhaps even accurate. However, it still places digitization at the heart of the discussion of the future rather than embracing people as the focus of further explorations into connectivity. The "digital age," in fact, cannot be empowering without empowering someone. This optimistic view of empowerment has simply not been realized. Conversations of complex product development still revert to a discussion of usability, as if "easily comprehensible" is somehow an investment of power. The Internet has not helped ease global tensions relating to religion and politics. In fact, it has possibly contributed to more censorship and the ability to spread hate speech. Cell phones have not assisted our culture in being more empathic but certainly have caused more traffic accidents. And, as Negroponte states, the Internet has certainly not stopped hunger. The potential, the vision of what this technology can do for humanity, is made understandable only when viewed from another subtly distinct perspective: What does humanity desire design to do? Humanity may desire, or even need, design to address the complex and gnarly problems that plague our culture and our economy.

John Maeda, a pioneer in creating connections between design and digitization, has created a Simplicity Consortium at the MIT Media Lab. The vision statement is itself a poetic view of design:

"In January 2004 the MIT Media Laboratory initiated a major research agenda focused on SIMPLICITY—a design-oriented program aimed at redefining our relationship with technology

in our daily lives. This goes well beyond removing buttons, slimming down screens, and shrinking interfaces to fit into the palms of our hands. It is a radical reexamination of ways to break free from the intimidating complexity of today's technology and the frustration of information overload. It is about inventing a future where less is more. While a certain percentage of the population will always be gadget geeks who cannot get enough of complexity and functionality in any electronic device, most of us yearn for a DVD player whose programming is intuitive, an online newspaper that can deliver the stories we want in a quick and easy-to-read format, or a cell phone whose instruction book has fewer than 100 pages. We dream of devices that give us joy rather than feelings of inadequacy."62

To look for simplicity in technology, however, requires a deeper understanding of human wants and needs and a dramatic departure from the heralding of technological advancements as ends in themselves. Author Stephen Johnson discusses the lack of the true, deep emotional quality in the popular acceptance of technology: "We're reminded a dozen times each day that the digital revolution will change everything, and yet when we probe deeper to find out what exactly will change under this new regime, all we get are banal reveries of sending faxes from the beach" (Johnson 1999). In order to truly embrace the potentials of digital interactions, we must acknowledge the true richness of human interactions and utilize a true range of expressions relating to technological implementation.

<sup>61</sup> Nicholas Negroponte. Being Digital. Vintage, 1996.

<sup>62</sup> MIT's SIMPLICITY Consortium, http://spectrum.mit.edu/articles/normal/less-is-more/

<sup>63</sup> Steven Johnson. Interface Culture. Basic Books, 1999.

#### Shifting negative behavior through design

One of the major shifts in culture that is occurring as a result of the so-called information revolution is our increased dependency on technology with regard to common, everyday activities. Many people view Google or a similar search engine as an extension of themselves; this reliance on a technical library of information to perform simple tasks creates both huge possibility as well as a troubling view of personal intellectual regression. This dependence has crept in slowly and now affects the majority of us in a silent and rather immediate fashion. Do you know the cell phone number of your wife or husband? How about your kids? The majority of us tends to program these numbers into our phones and promptly forget about them, as we know we have them readily available at the touch of a button. The same may be true of events, facts, and figures that we can find online or in our email; while we have freed our minds to consider other things, we may be on a long-term road toward disaster when our dependency gets the best of us and the proxy unit—the cell phone, the Internet, or our computer—fails us.

Consider a day without digital technology. Can you make it through one day—still completing your major goals for the day—without utilizing digital technology? From waking up to going to work—and your entire job may be, in fact, centered around digital technology—this reliance is on both the technical capabilities but also the ready accessibility we have to information. "Knowledge is power" may be outdated and shortsighted, but the essence of this mantra is true: Access to knowledge-

provoking data is powerful. We make lists, take pictures, pay bills, and learn and live, and all of this causes the fabric of the culture to depend on human-centric information dissemination.

An interesting exercise is to compare your own upbringing with that of a child born in 1990, growing up in a middle-class suburb of a great American city. This child, 15 years old in 2005, has grown up with cell phones, Nintendo, digital music, and instant messaging; they don't know of a life without the Internet, and there is a strong chance that the majority of their toys—even the most mundane—had a digital component embedded in them. Their formative years included cable television with over a hundred channels, multiple computers in their home, and the ability to access the enormous library of Google at a whim. They are connected, pervasively in contact, and to call them "computer savvy" is a strong understatement. This digital upbringing has impacted nearly every aspect of life and has dramatically changed the skills and cultural capabilities that one can expect to have when graduating from high school. These connected children—now teenagers—can intuit complicated software interfaces and have no fear of digital failure; they understand computing limitations and almost innately absorb and understand new technology. They approach technology in a fundamentally different way than the generations they succeed; it appears that they simply don't blame themselves when technology fails, and they deflect a great deal of the cognitive friction that we associate with high tech.

This comprehension comes at a cost, however; it has been continually argued that this knowledge has been at the expense of the more traditional academic skills, such as reading and writing. Students entering college today are ill-prepared to write

an analytically challenging research paper and have a hard time drawing connections between diverse and seemingly disjointed ideas. According to the fifth annual Reality Check study, a joint project by Public Agenda and Education Week, "Employers and college professors by large majorities nationwide say public high schools are graduating students with just fair or poor skills in writing, grammar, and basic math, and most do not consider a high school degree as any guarantee a student has mastered the basics."64 The National Assessment of Educational Progress (NAEP) reports an equally grim story: There are over 33 million K-12 students reading at least two grades below level, which is over two thirds of all K-12 students in the United States. The American Diploma Project (ADP) found that "... the high school exit exams that most states require students to pass before they graduate remain far too easy ... most of the exams generally test eighth- or ninth-grade level work."65

An Interaction Designer must attempt to advocate for humanity at all levels; this includes the vocal assessment of what has become a digital and highly disposable culture, one that highlights and educates people in a diverse set of skills at the expense of other, analog skills. Have we inadvertently created a generation of short-attention-span computer whizzes—teenagers who can't spell or think but can operate digital technology at lightning speeds? And if we have, is this necessarily bad?

There were 159 million cell phones in use in the United States in 20036; most of us own a cellular phone, and many of us own two. We carry digital cameras (more than 50 million were sold in 200367), digital music players (over 2 million iPods sold in 200468), digital gaming systems (Sony sold over half a million of the Sony PSP in the first two days of the product launch),69 and even digital keys. Combined with laptops, pagers, and the occasional Tomogotchi digital pet, the majority of Americans encounters portable Interaction Design daily. Neil Postman proposes an interesting addition to education in an attempt to fix this blind dependency on technology; his proposal is interesting in its presence within his primarily anti-technology text Technopoly, but also in the relationship he has created between language and technology. "I should like to propose that, in addition to courses in the philosophy of science, every school— again, from elementary school through college—offer a course in semantics—in the process by which people make meaning."70 Imagine if students were educated not only in the tools and skills necessary to be good at their jobs but were also taught to understand, respect, and consider the nature of things.

<sup>66</sup> Bergman, Mike. United States Census Bureau. "U.S. Cell Phone Use Up More Than 300 Percent, Statistical Abstract Reports." December 9, 2004. <a href="http://www.census.gov/Press-Release/www/releases/archives/miscellaneous/003136.html">http://www.census.gov/Press-Release/www/releases/archives/miscellaneous/003136.html</a>

<sup>67 &</sup>quot;50 Million Digital Cameras Sold in 2003." *Digital Photography Review.* January 26, 2004. <a href="http://www.dpreview.com/news/0401/04012601pmaresearch2003sales.asp">http://www.dpreview.com/news/0401/04012601pmaresearch2003sales.asp</a>

<sup>68</sup> Gibson, Brad. "Apple Posts Profit of \$106 Million, 2 Million iPods Sold." The Mac Observer. October 13, 2004. http://www.macobserver.com/stockwatch/2004/10/13.1.shtml>

<sup>69 &</sup>quot;Sony Sells over 500,000 PSP Units in First Two Days." Mac Daily News. April 7, 2005. <a href="http://macdailynews.com/index.php/weblog/comments/5417/">http://macdailynews.com/index.php/weblog/comments/5417/</a>

<sup>70</sup> Postman, Neil. Technopoly: The Surrender of Culture to Technology. Vintage, Reprint edition. 1993.

<sup>64 &</sup>quot;What Happened to the Three R's?." Public Agenda. March 5, 2002. <a href="http://www.publicagenda.org/press/press\_release\_detail.cfm?list=43">http://www.publicagenda.org/press/press\_release\_detail.cfm?list=43</a>

<sup>65</sup> Campbell, Jay, et al. "Trends in Academic Progress." National Center for Education Statistics. Washington, DC. August 2000. <a href="http://nces.ed.gov/naep/pdf/main1999/2000469.pdf">http://nces.ed.gov/naep/pdf/main1999/2000469.pdf</a>

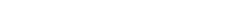
It would be irresponsible to blame only technology, of course; one element cannot truly be isolated from the others when discussing issues as complicated as culture. Technology cannot be the driving force behind our creations; if Interaction Designers are motivated primarily by technology, they have inadvertently become engineers, speaking the language of logic and valuing efficiency over emotion. Yet technology is our creations, quite often; an interface on a computer is only bits and bytes, and the interface is the product and the medium is the message and the gods certainly are crazy.

The largest, most important, and often least reflective decision a designer can make is the subject matter that she chooses to design for. In a consultancy, any authority over this decision is usually abandoned, as most consulting firms take whatever work happens to come through the door. In most corporations, this decision is answered implicitly by the domain of the company: Be it cell phones, video games, consumer electronics, or medicine, the designer chooses the company to work at and the work generally follows in a predictable fashion. Both career trajectories force the design subject matter decision to be implicit, subtle, and often ignored. Yet this decision frequently constrains the types of cultural changes and the form of behavioral change that a designer will likely be able to offer. Just as there are existing criteria for designing to support usability or, as has been proposed above, to encourage poetry, there should also be criteria and reflective judgment upon which to choose to design at all. As the role of a designer becomes more obviously influential, it

becomes increasingly necessary for a designer to have a point of view on his work and to fundamentally support design judgment not only of detailed design decisions but also of the design decisions related to subject matter and effort. Put simply, a designer has a limited amount of time in which to design, and not all design problems are equal— not all design problems are worth solving. Design has advanced to a point where designers must now force design judgment, where they must acknowledge the inconsequentiality of designing light fittings or chairs, and they must question the need to design more consumer electronics and gadgets and gizmos. Often the consequences of this form of conversation and introspection are personally negative: For those engaged in designing the next great mobile phone, it is easier said than done to simply quit their jobs, even when they fundamentally reject the consumptive culture they are helping to support. It is in the design of social systems, services, and humanitarian problem solving that these people will find new work and new sustenance, and it is in these topics—these wicked problems—that the discipline of design will finally come into its own.







### CHAPTER SEVEN: WICKED PROBLEMS



#### **Understanding Wicked Problems**

A wicked problem is a form of large-scale social or cultural problem that is difficult to solve because of incomplete, contradictory, and changing requirements. These dynamic, system problems are bucketed as "poverty" or "education"—large containers that fail to identify the nuanced nature of the actual issues themselves. For example, people in need of financial support may have difficulty paying their rent, feeding their family, holding a job, getting a job in the first place, and so on, a string of problems that lead to and are related to a state of destitution called poverty.

Clearly, not all problems are wicked; in fact, a problem can be incredibly difficult to solve but cannot be characterized as wicked until it has an indeterminacy of scope and scale. It can be argued that not all design problems are wicked, either—that the design of a chair, or a cup, or a website is fundamentally of a different nature from, say, the design of medical care or the design of an educational system.

The majority of societal problems are, by their very nature, wicked. Richard Buchanan was instrumental in advancing the discourse of wicked problems and design thinking, his primary contribution being an article he authored in 1992 called "Wicked Problems in Design Thinking." In this article, Buchanan describes that "design problems are 'indeterminate' and 'wicked' because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially *universal* in scope, because design thinking may be applied to any area of human experience."71

<sup>71</sup> Buchanan, Richard. "Wicked Problems in Design Thinking."

Design Issues, Volume 8, Number 2, Spring 1992, p. 16.



A related discipline of service design may offer substantial examples for conducting generative, probe-based research into wicked problems. In service design, the product is a service, something that almost always has an invisible component and is time-based. A traditional service might be one that leverages human capabilities. A lawn mowing service, for example, will trade someone's time (and presumably, their capabilities and skills) in exchange for money. A more timely example is Netflix; this company offers a delivery service of DVDs to the home through the mail system. Their product—the thing that people pay for—is the ability to interact with a website, to list movies that they want to see, and then to have those movies delivered to them at the frequency they desire. While there are artifacts involved in the service infrastructure (the DVDs are physical objects, and the website is a digital artifact that has been designed by a team of people to support particular tasks and goals), the service itself is nearly invisible. A service approach to Interaction Design starts by considering where value can be introduced into existing human flows and relationships and works outward from these human-to-human connections. Frequently, there is a need to describe digital, physical, organizational, and procedural changes to existing systems in order to complete a service design initiative.

Prototyping is critical in design, and it's no different in the design of service. What is different, however, is the medium in which the prototype is created. When prototyping a table, the designer uses various digital and physical forms to understand the various formal tradeoffs between size, shape, orientation, and so on. When prototyping a lawn mowing service, the designer must leverage different methods and materials. Storyboards,

storytelling, role-play, bodystorming, and method acting are all used to explore how situations may evolve or play out and how people may respond to various human interactions.

These methods, and a larger philosophy that embraces a service design approach to problems, are critical in the design of products, services, and systems intended to support any form of humanitarian problem solving. Because wicked problems are by definition societal and cultural, they always involve people, and mitigation strategies to these problems always involve some form of service. Time-based prototypes and ways of simulating human interactions are fundamental in advancing design ideas and in working around Rittel's description that "solving a wicked problem frequently is a 'one shot' design effort, as a significant solution changes the design space enough to minimize the ability for trial and error."

Because of the scale of these problems and the difficulty in testing solutions in a meaningful way prior to large-scale rollout, it may prove impossible to actually solve a wicked problem in the same way that one may solve a client problem (arrive at a state where the problem no longer exists—where the suboptimal state has been converted into a more optimal state). But this hardly signifies that these issues aren't worth addressing. Instead, the language that is used to describe and analyze the design approaches must shift, as must the perspective of those engaged in these problems. Granting agencies in the United States commonly demand a project approach that is finite and with a definitive start and end. This likely makes financial reporting easier for the agency and eases the minutiae of running the foundation (audits, for example, can be scheduled against a predetermined

project plan). But this makes sense only when a predictable measure of success can be anticipated for a particular project. If a design strategy is to mitigate the emotional and cultural repercussions of poverty and limit the spread of homelessness to new generations and the tactics are experimental, one may be hard pressed to conform to a predetermined timeline. And efforts to force a project schedule around such a design engagement will likely impose arbitrary checkpoints and metrics that may serve only to add anxiety and stressors to the design team.

There are a number of ways of addressing wicked problems, and because of the scope and scale of these problems, it is likely a combination of approaches that will offer the most benefit. Designers are likely drawn to these problems because of the strong relationship between design and problem solving; many designers consider themselves problem solvers first and stylists second. There are several design-specific commonalities of wicked problems that distinguish these from more typical artifact-based design problems (design a chair or design a new website).

In wicked problems, the number of stakeholders is larger, and frequently, these stakeholders have competing (and often illogical) goals. For example, consider a seemingly positive activity like bringing computing power to African students, something at the heart of the One Laptop Per Child project. The solution of OLPC touches at least the following stakeholders: the governments of each country involved (in Africa, this includes Mali, Ghana, Nigeria, Cameroon, Ethiopia, Kenya, Uganda, Rwanda, Mozambique, and South Africa); the World Economic Forum; Quanta Computers (the manufacturer of the hardware); the UN Development Program; fuse project (the designer of the

hardware); Pentagram (the designer of the software); MIT Media Lab (the originating educational research institution); Fedora/ Red Hat (the operating system); and many, many more. The likelihood of alignment between these agencies is low without a tremendous amount of facilitation, project management, and personal appeasement by a centralized coordinating agency.

The content is politically charged. The OLPC is an example of a placement shift, where the expected and obvious form of the solution is purposefully altered. One might assume that, in countries with massive poverty, the best forms of aid are water and food. Yet the OLPC project ignores both of these, characterizing them as short-term solutions to larger problems. Instead, education is necessary to drive self-sufficiency; it's the "teach a man to fish" adage embodied in silicon. This is, obviously, highly controversial. In fact, the OLPC site has an entire section on their website dedicated to refuting what they call a myth that "You're forcing this on poverty stricken areas that need food, water and housing rather than a laptop"; in their refutation, they state, "It is difficult to argue that education is not a necessary component to poverty reduction, probably being more effective than food donations or development aid; it is even more difficult to argue that children can be taught without books."72 Negroponte addresses this directly in an interview with 60 Minutes:

<sup>72</sup> OLPC Myths. <a href="https://wiki.laptop.org/go/OLPC\_myths#You.27re\_forcing\_this\_on\_poverty\_stricken\_areas\_that\_need\_food.2C\_water\_and\_housing\_rather\_than\_a\_laptop.">https://wiki.laptop.org/go/OLPC\_myths#You.27re\_forcing\_this\_on\_poverty\_stricken\_areas\_that\_need\_food.2C\_water\_and\_housing\_rather\_than\_a\_laptop.</a>

LESLIE STAHL: You go into countries in which there may not be enough food, where the children may not have good enough education to even teach them to read; why a laptop? It almost sounds like a luxury for these people who need so much more than that.

NICHOLAS NEGROPONTE: Let me take two countries: Pakistan and Nigeria. 50% of the children in both those countries are not in school.

#### LESLIE STAHL: At all?

NICHOLAS NEGROPONTE: At all. They have no schools. They don't even have trees under which a teacher might stand.

LESLIE STAHL: You're saying give them a laptop even if they don't go to school?

NICHOLAS NEGROPONTE: Especially if they don't go to school! If they don't go to school, this is school in a box.<sup>73</sup>

There are more significant repercussions of both good and bad actions. Speaking directly to design judgment, this becomes a barometer to gauge impact. By designing coffee mugs and shoes and cars, we design behavior implicitly and in a diffused fashion. By designing for impact and addressing wicked problems, we design behavior explicitly and in a direct manner.

#### **Design for impact**

There's been a recent trend in popular media and design toward designing for impact or social innovation. Both phrases describe a repositioning of design activities in the context of the social good. The phrases imply planned, methodical approaches to problem solving that focus on behavioral change through empathy and prototyping. While design has always embraced humanity through a focus on end users (often described as "usable, useful, and desirable"), this is a purposeful shift away from design as an entity embedded in a business context and toward the realization of design as a methodology for social good and improvement that is distinct from processes of the corporation—that can stand on its own, without a corporate financial system backing it.



<sup>73</sup> One Laptop Per Child on 60 Minutes. Transcribed. <a href="http://www.olpctalks.com/nicholas-negroponte/olpc-60">http://www.olpctalks.com/nicholas-negroponte/olpc-60</a> minutes interview.html>

When design is embedded in the context of business, designers can reap the benefits of the corporation. Design activities can be well funded (although they frequently are not) and can leverage supply and distribution channels, and designers can utilize existing brand equity to encourage adoption of new products, systems, and services. Yet with all of these benefits, the confines of the corporation impose equal restrictions. Designers must frequently justify their activities in the context of ROI, attempting to quantify the subjective qualities of design to substantiate their continued financing. A publicly traded corporation introduces artificial time constraints on design activities, as quarterly profit announcements tend to introduce chaotic shifts in focus and reorganizations around seemingly arbitrary goals. And while designers may find personal satisfaction in the work they do on a day-to-day basis, the goal of the for-profit corporation is just that—profit—and so issues of humanitarian benefit and appropriateness are by definition given second-class priority, if any whatsoever.

Design, absent the context of business, has new opportunities and new challenges. Designers focusing on social innovation may find themselves without the necessary financial means to introduce their products, systems, and services. When designers target problems in foreign countries, they may not have the appropriate means of distribution to reach their target audiences. New challenges are introduced, such as navigating the political infrastructure of developing countries, and addressing these challenges in a meaningful way takes valuable resources. Yet the benefit for many who engage in designing for impact can be enormous. Design, absent the confines of business, is no longer tied to the short-term thrust of quarterly profit reporting, where growth needs to be exhibited continually and in small increments (every

3 months). Issues of financial profitability are replaced with concerns of financial sustenance: Can the organization generate enough money to continue to realize the intended solution?

And of most importance, a designer focusing on humanitarian impact can address issues that are of most pressing concern to humanity without being forced to address questions of financial viability, brand differentiation, constant innovation, and the competitive drive of the marketplace. In a sense, designers engaged in these types of activities are given the benefit of judgment, as they can decide what problems to focus on. While a designer at a major communications company may bemoan the task of designing a ring-tone purchasing flow or an advertising campaign for unlimited minutes, designers engaged in social and humanitarian change can ultimately select to focus only on the problems that they find most pressing, demanding, and important.

Perhaps more interesting than the dichotomy between for profit and for impact is when these two extremes blend together. There have been several illustrations of design in the context of business, focusing exclusively on humanitarian impact yet with all intent of driving large-scale revenue generation.

SOCIALLY RESPONSIBLE PEANUT
BUTTER IS IDEAL FOR ANTS ON A LOG

Nutty Solutions is a peanut butter company that intends to fight against malnutrition in children at key stages in their development. The company intends to produce gourmet peanut butter (usually sold for a high premium in the United States) and then use this revenue stream to finance the production of RUFT, or ready-to-use therapeutic foods, intended for consumption in Nepal, where a "a child dies of malnutrition every 14 minutes. We aim to establish a local RUTF production facility here, in collaboration with non-profit organizations working in the area."<sup>74</sup>

MPower Labs is an incubator and business accelerator that exists to "empower the underserved by accelerating the growth of businesses that bring new and needed products and services to this market."<sup>75</sup> This involves the funding and coaching of startups that drive financial service products intended for those in need, such as Rêv Worldwide and Mango Financial, Inc.

Both of these examples have framed design in a larger context of social good while embracing standard business issues of revenue generation, growth, and frequently, outright profitability. The result can be extremely powerful, as the distribution mechanisms of the for-profit business can be leveraged to reach a massive audience and distribute a powerful message.

#### The Bottom of the Pyramid

The pyramid referenced in the phrase the bottom of the pyramid is a wealth pyramid that describes the small quantity of haves at the top with an exponentially larger quantity of have nots at the bottom characterized primarily by their lack of income (often less than a few dollars per day). The pyramid makes visual what has long been the distribution of wealth in the world—that a small number of people maintain control over a large amount of resources. But the late C. K. Prahalad uses the pyramid to illustrate a much less politically charged, although highly controversial, message: that through volume, there is a fortune to be made at the bottom of the pyramid if only we understand the cultural implications of designing for, and selling products to, those who find themselves at that part of the system. This is the seeming utopia where the five billion citizens in the developing world will find themselves with purchasing power and access to manufactured goods for sale, for the first time, ever. Prahalad urges large companies to target those developing this purchasing power and in some cases even seems to imply that the risk of not targeting the developing world could be financially catastrophic. As he describes, "The World Resources Institute and the International Finance Corp. just concluded a massive study, and they came up with 4 billion people living on \$2 or less a day. In a family of five, that's \$3,650 per year... In India, wireless-communication companies are adding 5 million new subscribers per month.

<sup>74</sup> Nutty Solutions Mission Statement. "Sustainable and Scalable Funding of Ready-to-Use Therapeutic Food Production." <a href="http://nuttysolutions.weebly.com/our-mission.html">http://nuttysolutions.weebly.com/our-mission.html</a>

<sup>75</sup> MPOWER Labs Mission Statement. "Mission & Philosophy." <a href="http://www.mpowerlabs.com/about/who\_we\_are.php">http://www.mpowerlabs.com/about/who\_we\_are.php</a>

They expect, by 2010, to have 400 million subscribers connected wirelessly. If you're Nokia, or Motorola, or Ericsson, and you don't participate in that market, 50% of your future business is gone."

But not all agree with Prahalad's view of private enterprise acting to sell to the poor. Some claim that he's overestimated the size of the market, while others take issue with his view of the poor as consumers, emphasizing that they have labor and productive capacity and that the fortune at the bottom of the pyramid will come from empowering the poor to produce and then by purchasing goods and services created by them.

Irrespective of the specific means by which those at the bottom of the pyramid are introduced into the larger consumer/ producer financial ecosystem, the introduction appears both inevitable as well as filled with promise and potential.

Technological ubiquity and affordability are the means by which these developing countries are becoming empowered, and design will be the way in which this technology is humanized and introduced. It is designers who will bear the ethical responsibility and ask the difficult questions of appropriateness, and so it is designers who must learn methods of cultural empathy and explore the significance of new product and service introduction.

Technological ubiquity has introduced a new look at—and frequently, rejection of— institutionalized social services.

These services are usually large, anonymous, process-based systems that serve a mass quantity of people poorly rather than a small quantity of people well. These types of services exist in health care, education, and government. And the rejection of these services appears to be a coalescence of personal care, personal education, and technological enablement.

Designer Hugh Dubberly notes a similar trend: "Reframing health as self-management parallels similar trends in education, where we increasingly recognize students manage (or design) their own learning, and design practice, where we increasingly recognize users manage (or design) their own experiences. Perhaps these changes are part of larger trends, the democratizing of professionalism and the shift from a mechanical-object ethos to an organic-systems ethos." This trend helps to explain the recent fascination with design in the context of big business (or perhaps the fascination helps to explain the trend); the designerly way of considering problems is organic, not linear, and certainly not driven toward algorithmic repeatability.77

In some ways, the institutional services that may be rapidly failing us—health care, education, and government—mirror the commodity object markets that have emerged in consumer electronics and car manufacturing. And the reasons may be the same but made much more acute by the personal interactions necessary in a service: users are more different than the same,

Design in medicine, health care, and education

<sup>76</sup> Breen, Bill. C.K. "Prahalad---Pyramid Schemer." In Fast Company, March 1, 2007. <a href="http://www.fastcompany.com/magazine/113/open\_fast50-qa-prahalad.html?1273562571">http://www.fastcompany.com/magazine/113/open\_fast50-qa-prahalad.html?1273562571</a>

<sup>77</sup> Hugh Dubberly. Reframing Health to Embrace Design of our Own Well-being. in Interactions Magazine, May/June, 2010.

cannot be easily segmented or chunked or profiled, and can, with the aid of education and technology, provide the same service offered by the institution, but in a much better fashion.

Dennis Littky sees a future for the application of design in the context of education. He developed the Big Picture, a new approach to K-12 education, which is now extending to college, in an effort to mitigate the enormous dropout rate of at-risk youth (primarily blacks and Hispanics) for whom traditional educational methods of rote memorization simply aren't working. While alternative models for education have existed for a long time, Littky's is one of the first that takes an approach of both depth and scale, and it is this combination that repositions his efforts as "designerly": He wants to change not only local culture but also the larger infrastructure of education in the United States entirely.

Littky's model doesn't reject educators, and Dubberly isn't calling for the rejection of doctors, teachers, and traditional politicians. In the same way that designers build experience frameworks for people, so too will these professionals begin to control more of the experiential and behavioral qualities of their services. In many ways, this begins to feel like the true democratization of design, and the designers themselves can begin to support other professionals in humanizing the technology associated with their professions.

And so the doctor no longer treats the patient by addressing the discrete symptoms that make up a discrete problem. Instead, they work together to build a lifestyle health plan that's unique for the individual. Why are you getting a cold every other week? What types of food do you eat? Let's observe your exercise routine. Perhaps the doctor will spend a day with a patient, observing her life and proposing changes both nuanced and large.

Teachers no longer teach the students by delivering content to be learned. Instead, they work with students individually to build an educational plan that's unique for the individual. "You learn best visually, by making things? Great—let's apply that in everything from science to physical education. Most interested in things relating to guns and weapons? Fine—we'll use that as a backdrop to describe math and physics." Nutrition coaches go shopping with clients, watching how they shop and then helping them correct their behavior. Schools like the Big Picture offer the one-on-one learning (and in many cases, one student with three teachers) described above. Clearly, the deinstitutionalized services require a dramatic shift in the number of hours spent between professional and user. But that's a part of the larger trend Hugh describes above—the shift toward an organic-systems view of the world, where efficiency and number of customers served are simply irrelevant metrics to track human services.



#### Rejecting financial goals and financial structures

This deinstitutionalization—new forms of education, new structures for consulting, and a renewed focus on design for impact—point toward a trend in design away from traditional financial goals and financial structures. Many of those engaged in these initiatives are under 40 years old and have a dramatically different set of life goals than did their parents or grandparents. Career actions that might have seemed absurd even 10 years ago are no longer written off as fundamentally impractical: actions like moving to India or China or another developing country or abandoning a high-profile and well-paying job for a less profitable humanitarian start-up or nonprofit. These types of jobs almost implicitly reject the "family, big house in the suburbs, and a two car garage" that has been the norm since the 50s and fundamentally question the financial yardstick of career success in a profession as dynamic and creative as design. In many ways, the younger generation of designers has abandoned a great deal of the organizational structures that have contained design for years.

The design consultancy has been a fundamental part of the business ecosystem for close to a century. In the consultancy model, designers partner with organizations in the context of a project—a finite creative engagement, usually centered on a particular design problem (the project brief). Designers may produce deliverables for the client, which are then extended, reused, and socialized inside of the corporation. An example might be a brand system, produced to define a set of branding parameters for known products. Once delivered, this brand system can evolve to be applied to new products. Or a design consultancy may focus on a specific product, working within

constraints defined by the corporation. Typically, a design consultancy can work faster than a corporation, as the consultant is freed from both the day-to-day minutiae of the corporate setting (endless meetings and conference calls) as well as from the internal politics that plague many large companies. And a designer at a consultancy may benefit from and appreciate the diversity of projects, avoiding burnout and allowing the designer to bring a new frame of reference to a project or problem. Thus, a design consultancy is characteristically fast, targeted, and able to approach problems from fresh perspectives.

A new model of design consultancy is emerging: the nonprofit design consultancy. This form of design agency has all of the aforementioned benefits and focuses exclusively on projects related to social change and impact. Instead of charging hourly rates of \$200 and \$300, these firms work for free and depend on grants and donations to support their efforts.

Project H is one of the most notable examples of this new approach to design. Founded by Emily Pilloton, Project H is "a team of designers and builders engaging locally to improve the quality of life for the socially overlooked." Emily's teams engage in a variety of local work, usually on a not-for-profit basis, and work with local institutions (such as schools or healthcare venues) in order to craft unique solutions to their unique problems. Frequently, with little modification, the solutions that were implemented in one area scale successfully to another, creating the potential for locally inspired global mass dissemination. An example is the learning landscapes project,

<sup>78</sup> Project H Design. <a href="http://projecthdesign.org/">http://projecthdesign.org/</a>

created by a team of designers that includes Industrial Designer Dan Grossman. The project, "a scalable, grid-based playground system for elementary math education" utilizes physical space and low-cost materials to create a modular system for teaching math. Grossman took on the project to illustrate how design can be democratized. "In today's world it's apparent that good design is a privilege instead of being a right. In order to get good design into the hands of people who need it most you ask many questions, but how much does it pay should not be one of them."<sup>79</sup>

As Emily describes, the greatest successes in design for social innovation have come from "work that is local, deeply entrenched, long-term, and in our own backyards. I firmly believe that lasting impact requires all three of the following: proximity (simply being there, in the place you seek to design with and for), empathic investment (a personal and emotional stake in collective prosperity), and pervasiveness (the opposite of acupuncture, involvement that has impact at multiple scales)."80

A similarly named but entirely unrelated Project M is another example of this model, approaching education and design at a local and activist level. Project M, founded by John Bielenberg, desires to change the world through local, small and targeted projects that involve some form of communal building and, usually, a method of content formalization and dissemination. As an example, Buy A Meter is an attempt to call attention to the lack of clean drinking water in Hale County, Alabama, where one in four households is not connected to the municipal water

system. Through their awareness campaign, the effort has raised \$45,000, or enough for close to 106 new water meters, appropriate for connecting 106 families to the water system.<sup>81</sup>

Both Project H and Project M take the capabilities that are traditionally employed by designers in for-profit consultancies and recast these in the context of not-for-profit engagements. These are local efforts that follow the design process, including ethnographic research, synthesis, ideation, and some form of productive dissemination, but the goal is not to create for-profit solutions that are mass produced or marketed; instead, it is to solve a local problem with social consequences.

<sup>79</sup> Interview with Dan Grossman, 2009.

<sup>80</sup> Pilloton, Emily. "Depth Over Breath: Designing for Impact Locally, and For the Long Haul." Interactions Magazine. May/June 2010.

<sup>81</sup> Buy A Meter. <a href="http://www.buyameter.org/oneinfour.html">http://www.buyameter.org/oneinfour.html</a>



### **Design education**

It is not just design that has changed to embrace a new norm of social and humanitarian change. Design education, too, has evolved to focus on these new constructs.

Academic institutions offering master's work in design and innovation instruct and encourage students to explore problems that have a social component. Students may investigate issues of sustainability, or a class project may provide pro bono design services to a local agency or humanitarian group. Additionally, students pursuing a PhD in a design discipline may investigate, in great depth, more complicated social issues such as homelessness or hunger. And in Europe and Asia, Cumulus—the International Association of Universities and Colleges of Art, Design and Media—has been successful in exploring topics of equality and ethics and in driving ethics and humanitarian design education research.

Yet only five United States--based schools participate in Cumulus (of well over 100 total member schools), and there is also a strong tendency for design schools in the United States to embrace the financial allure of business and to offer projects sponsored by large corporations. These projects act as capstones for professional degrees, where non-novice designers come to advance their skills (and often to decompress from the feelings of dishonesty described above).

Austin Center for Design, founded by the author of this text, exists to transform society through design and design education. This transformation occurs through the development of design knowledge directed toward all forms of social and humanitarian problems. Parsons has launched a transdisciplinary

program focused on cultural anthropology and bringing together multiple disciplines of design in order to drive problem solving. "We start from the premise that there are certain challenges in the world that are too complex for an individual design discipline to address. So we wanted a place in the curriculum where we could embrace that complexity and use the design process to make a difference."82 These new design programs will train the future generations of designers and will leverage existing momentums in society in order to help continue the extraction of design from the artificial confines of business.

A shift in education creates the opportunity for exponential change over the long term. Design students who, in the 80s, learned human factors and ergonomics as a core of their curriculum have gone on to evangelize for user-centered design in their professions. Similarly, students who learned sustainability as a core competency of design in the past decade now integrate environmentally appropriate techniques in their jobs as a standard practice. By shifting design education away from the confines of business and toward the subject matter of humanitarian problem solving, we can create a generation of designers who expect to work on problems that are meaningful and socially pressing. This requires a continual conversation of judgment and values—a conversation that reiterates that not all problems are equally worth solving.

<sup>82</sup> Tischler, Linda. "Parsons Launches Transdisciplinary Design Program. Whatever That Is." Fast Company, February 23, 2010. <a href="https://www.fastcompany.com/1559917/">https://www.fastcompany.com/1559917/</a> parsons-launches-transdisciplinary-design-program-whatever-that-is>

Victor Papanek noted in his well-known text that "It is the prime function of the designer to solve problems. My own view is that this means that the designer must also be more sensitive in realizing what problems exist." 83 We can choose to work on complicated, multi-faceted problems with the same set of tools used to solve more simplistic problems of form, style, or brand. If designers are capable of shaping the poetic experiences of life, it follows that they are also capable of shaping poor experiences either through lack of skill, poor execution, or simply by selecting inconsequential projects to spend their time on. Consider the value provided by selecting problems related to social, political, or economic stability, and compare this to the design of a consumer-facing online bookstore. Which has a larger value and for whom? It is not the intention to argue against the development of artifacts for consumption and for consumptive products. However, designers need to be truly aware of the repercussions of their choices and to understand that they are, in fact, designing simply by selecting to spend their time within a certain discipline or genre of problem solving.

### **Designing For/Designing With**

In all of these examples—the wicked problems of health care, developing countries, education— a subtle philosophical shift occurs. Designing is no longer about producing something for someone else to consume, where the designer acts independent of a situation and with a target audience's best interests in mind. Instead, design is now about designing with other people. The role of an interaction designer is less about creating a beautiful, appropriate, or even usable form or artifact. Instead, the designer now plays the role of facilitator and translator, one with deep material expertise and the ability to make connections between a wide range of seemingly disconnected ideas. Design becomes a public activity, and the designer is now the choreographer.

Co-design or participatory design methods require that nondesigners—people who are not trained in producing new ideas or visualizing these ideas—are given both an environment and a toolkit from which to create. This is the act of facilitation: of fostering a collaborative environment where nondesigners feel comfortable making design decisions or recommendations. A strong facilitator can understand and anticipate group dynamics, can effectively leverage a long period of time (sometimes a week or more) in a way that is efficient and productive, and can make all participants feel comfortable. Similarly, when nondesigners are given enough basic tools, they can create representations of their ideas in enough detail that they can confidently explain, rationalize, and argue for a particular design.

While facilitating a group session, an interaction designer begins to act as a translator, both visualizing ideas as they are developed and refined and also translating vague descriptions,

<sup>83</sup> Papanek, Victor. Design for the Real World: Human Ecology and Social Change. Academy Chicago Publishers, 1985.



gestures, or references to new ideas into more actionable, concrete representations. To do this effectively, a designer leverages deep material expertise to anticipate which ideas will work, how to adjust an idea to be more successful, and how to best represent an idea in a manner that can be explored further. The medium that an interaction designer manipulates is human behavior, and the material that is frequently leveraged is a digital fabric: bits, bytes, pixels, and processors. During a facilitated session, the designer leans heavily on personal experiences with digital artifacts and an understanding of how people commonly use or consider these tools.

It is interesting to consider the implications of a design that allows regular people—people who don't claim to be artists and may rarely get a chance to create much of anything at all—to be creative and to experience the mindful state of flow described earlier. Imagine the idea of design empowering regular people to create and to experience the joy and personal satisfaction that comes with the development of a new idea and the embodiment of that idea in something tangible. This idea that non-designers can be creative if provided with the proper tools is at the heart of psychologist Liz Sanders' work on participatory design and design toolkits. As she describes, including non-designers in cocreation "at the early front end of the design development process can have an impact with positive, long-range consequences."84 Sanders describes how toolkits of rudimentary parts can be created and utilized by people who have no formal design training to give them the voice and

vehicle necessary to create. Lego blocks allow people to easily produce shapes and structures without engineering knowledge, and in a similar fashion, design toolkits allow people to easily produce artifacts without an understanding of design principles.

Moving from designing for to designing with is challenging but similar in magnitude to the change many designers experienced moving from designing the physical to designing the digital. The old design process was still applicable, but specific skills and techniques were no longer necessary or appropriate, and in many cases, an entirely new language was necessary to support the new digital problems facing stakeholders. Some designers made this shift successfully, while others struggled to remain relevant in a world that suddenly looked very different. Designing with will threaten traditional methods and designers who are hesitant to adapt and who haven't completely embraced a humanitarian approach to design. But simultaneously, a new generation of designers is learning the ability to facilitate large creative exercises with end users, to convert data into actionable insights, to speak to the material challenges presented by these new design problems, and to forge connections between seemingly disparate subject matter in the context of wicked problem solving.

<sup>84</sup> Sanders, Liz, and Pieter Jan Stappers. "Co-creation and the New Landscapes of Design." *CoDesign*. March 2008.



### IN SUMMARY



This text has defined Interaction Design in a way that emphasizes the intellectual and cultural facets of the discipline. It has discussed the role that language, argument, and rhetoric play in the design of products, services, and systems. This idea of language is extended to poetry, and the text has introduced the idea of a poetic interaction—an interaction that affects not only the mind and body but also the soul.

The text has also examined the process Interaction

Designers use when they approach complicated problems
related to behavior and time. This process includes structuring
large quantities of data, thinking about users, and attempting to support human behavior as it unfolds over time.

The text has introduced the idea of Interaction Design as an integral facet of emerging culture that is often related to but inherently separate from the traditional business development process. Interaction Design, when successful, is positioned as a critical component of complex problem solving, not as some ancillary service that is called in at the end of a project.

And finally, the text has prescribed a purposeful extraction of Interaction Design from the confines of business to leverage the design process for social, political, and economic problem solving. Instead of developing websites and toasters, imagine what would happen if leading designers focused their design efforts on problems of a social scope. Consider the application of intellectual, methodical processes of design in the context of politics, or government. Could the economic stability of the United States or the social welfare of a developing country be considered design problems of a large scale?

Designer Milton Glaser has publicly declared that "Good design is good citizenship." Consider what it means to be a citizen, good or not. The word implies an acknowledgment of others, of cultures, and of the social and political environment in which our creations will live. This negates the ego and hubris for hubris' sake that has tainted product design for the past decade.

Artists frequently use their work to comment on political, socioeconomic, and cultural issues. Art has been used as a method of understanding the nuances of culture during a specific time frame in history. As design is often described as a form of art, design solutions can be thought of as windows into the world of culture. These solutions often provide a glimpse of the value system present within a specific time period. The growing application of design within fields of branding, media, and mass marketing demonstrate an underlying consumer-based (and highly commercially driven) path through the information age.

<sup>85</sup> In Stephen Heller's Citizen Designer, Allworth Press, 2003

Maurizio Vitta discusses this material culture in his text The Meaning of Design. He explains that cultural expectations are placed on a designer. These expectations are generally thought of as making life better (or at least making life prettier) but are frequently convoluted through issues of aesthetics or brand visualization. But the culture of objects is of central importance to understanding the culture of design. The objects themselves are embedded with a deep social significance and become the sign of philosophical and ideological resonance. As we consume, we in fact signify to ourselves and to the world around ourselves a particular value system. This becomes dramatically magnified when we consider the number of items that we have at our disposal to choose from. Essentially, the consumer can signify anything he wants by selecting appropriate goods, services, and systems. As these begin to lose their functional resonance and importance, the primary essence of a design becomes its ability to transfer language to a consumer. What something does seems to have become much less important than what it shows. In fact, the designer does create culture. He provides options, and through the signification process of these objects, a culture is established.

Vitta explains, "On the one hand, indeed, in a reflected manner, [the designers] enjoy the same central role as that of the objects they design; on the other hand, their cultural character, although endowed with great prestige today, runs the risk of taking on the fragility and flimsiness

of designed objects themselves."86 Design is transient. The culture we have helped create has as much attention deficit disorder as those participating in the culture.

It's now time to extract design from the confines of business and allow it to grow on its own. Positioned as social entrepreneurship, social innovation, or the new design, designers are fundamental in structuring a world worth living in. Human behavior is innately poetic; it is natural and thus resonates poetic in the same way as does a flower, or a bird, or a tree. It is through our own design of objects, services, and systems that we may have disturbed the poetry. A focus on technology or aesthetics alone creates a world of ideas that often seems discretely disconnected from humanity. Through the combination of technology, aesthetics, and humanity, we will find a world of Interaction Design. And Interaction Design, as the study of dialogue between people and things, will bring harmony to technological advancement.

<sup>86</sup> Maurizio Vitta, The meaning of Design. In Victor Margolin's Design Discourse, University of Chicago Press, 1989.

## WORDS,

### WORDS



### **Abductive Thinking**

A form of logic based on intuition and hypotheses, sometimes described as the "logic from best explanation." This form of logic is the form employed by designers, who frequently have most but not all of the information required to make an informed and generative design decision.

### Aesthetics

Usually used to describe visual beauty, aesthetics can be considered the analysis, study, or consideration of elements of pleasure or happiness as related to a stimulus. Aesthetics also has connections to ancient philosophy, as thinkers like Aristotle and Plato continually considered the role aesthetics plays on the soul.

### **Affinity Diagram**

A diagram that is built from the bottom up to find patterns and groups in a large quantity of data.

### Carnegie Mellon University (CMU)

Carnegie Mellon plays an important role in the evolution of Interaction Design. The university, in Pittsburgh, Pennsylvania, offers graduate-level programming in Interaction Design, Linguistics, Cognitive Psychology, and Human-Computer Interaction. The school has played host to a number of figureheads who were instrumental in the development of Interaction Design as a discipline; these include John Rheinfrank, Richard Buchanan, Shelley Evenson, Jodi Forlizzi, Craig Vogel, Herb Simon, and Allen Newell.

### Codesign

A philosophical approach to design that integrates end users into all aspects of the design process to ensure that their value structure is represented in the design solution.

### Concept Map

A concept map is a diagram of the relationships between entities in a system. The visual style of the map may take many forms, but the content usually consists of nouns (entities) and verbs (relationships), with a literal connection between the two. Bubble diagrams and Web diagrams are forms of concept maps.

### **Contextual Inquiry**

A traditional interview may ask a participant a set list of questions and rely on the participant to remember or recall the answers to these questions. Conversely, contextual inquiry is a process that involves watching participants as they go about a task or an activity. As memories can be inaccurate, the contextual inquiry process provides a strong understanding of what really happens as compared to what a user may think happens.

### **Convergent Thinking**

Convergent thinking is the highly analytical process of narrowing down many choices toward the most logical and correct answer. This is an evaluative process, where ideas are judged and rejected or accepted based on some set criteria.

### Critical Incident

A critical incident is an event that affects the usability of a system. Critical incidents are discovered using various forms of user testing, such as Think Aloud Protocol. A critical incident indicates that something of note—and usually unexpected—has occurred. This frequently illustrates a usability flaw.

### **Customer Journey Map**

A diagram that visualizes the various touchpoints a user will have with the larger context of a product, service, or system.

### Data, Information, Knowledge, Wisdom (DIKW)

The Data—Information—Knowledge—Wisdom chain is generally referred to in fields of Information Management or Library Sciences and illustrates the path toward enlightenment that occurs through experience. DIKW is commonly referenced by Information Architects, as they attempt to wade through large quantities of data and extract relevant information to provide to a user.

### Dialogue

The idea of dialogue in Interaction Design indicates that humans have a relationship with designed artifacts that extends beyond the functional. Dialogue implies a sense of longevity and a sense of experience and serves to elevate the user to a peer level of both the artifact and of the designer.

### **Divergent Thinking**

Divergent Thinking is a critical part of the process of Design; it requires the rapid generation of a large and diverse quantity of ideas. During the beginning of the Design process, rapid visualization sketching is often used to generate many different solutions to the design problem. These solutions are then narrowed down through a more constrained process of convergent thinking.

### **Ecosystem Diagram**

A visual representation of a system or brand, commonly used to describe a set of user engagement points.

### Ethnography

While ethnography has formally referred to a form of anthropology that examines culture, it has been integrated into the Design process as a method of understanding people and problems associated with work. Ethnographers study cultures, and so too do designers.

### Flow

Flow is the state of focus described by artists and designers and documented by Mihaly Csikszentmihalyi that is necessary to produce creative work. Flow requires a total immersion and awareness of the present activity, with no regard for deadlines, no interruptions, and little awareness of oneself.

### **Focus Group**

A focus group is a marketing technique used to gather opinions from a small set of the population about a product, service, or system. A facilitator leads the group of people through various scenarios and questions and directs questioning toward a certain goal.

### Graphical User Interface (GUI)

A graphical user interface describes the digital set of controls, and the methods of interacting with these controls, that the user is confronted with while using a piece of software. Traditional GUI controls include windows, icons, scrollbars, and other widget-style controls.

### **Heuristic Evaluation**

A usability inspection method that compares an existing interface to a set of guidelines, or best practices, that help to identify usability problems. This is considered a discount usability technique because it requires no users—only trained facilitators—and thus takes considerably less time and resources to conduct.

### Human--Computer Interaction (HCI)

The field of HCI exists to understand the nature of human factors in computing. It examines issues that relate to the ways people interact with computer systems.

### **Human Factors**

Human factors is the field that examines the physical and cognitive performance of humans as they interact with human-made creations. The phrase is typically used synonymously with ergonomics, as to imply a sense of reduced physical discomfort or fatigue.

### Industrial Design

Industrial Design typically refers to the field responsible for the creation of mass-produced objects; however, this definition does not serve to contain the work done in the creation of system design or service design. Some choose to think of Industrial Designers as problem solvers rather than form givers.

### Information Architecture

Information Architecture is a relatively new discipline with roots in the fields of computer science and library science, but to call it a science itself would be much too pragmatic and would not fully acknowledge the emotional user-centeredness of this discipline. To be an architect of information, one must embrace the end goal of clarity, comprehension, and creation. Ultimately, an information architect exists to make meaning out of data.

### Interaction Design

Interaction Design is the creation of a dialogue between a person and a product, service, or system.

### Interactive Design

Interactive Design implies a focus on the technological layer that exists between a user and a piece of software or a website.

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### Interpretation

To interpret is to judge critically and create meaning. Interpretation is a critical aspect of the Design process; after conducting research and gathering a great deal of data, it is imperative to interpret the data to truly understand the significance of it.

### Offshore Product Development

Offshoring is the process of outsourcing various services to another country, typically with a large financial incentive. While offshore manufacturing was perceived as a threat to the United States in the 1980s and 1990s, it has become a standard method of mass producing goods.

### **Process Flow Diagram**

Also known as data flow diagrams or decision tree diagrams, a process flow diagram is traditionally used in the fields of electrical engineering and in computer science to illustrate the logical flow of data through a system. These diagrams assist in understanding the discrete rules, and their relationships to one another, that make up an activity. This analysis tool can then be shared with engineers in order to articulate and demonstrate the rationale behind design decisions.

### Product Requirement Document (PRD)

A PRD is generally created by marketing to define the feature set and use cases of a product, service, or system.

### Scenario

A scenario is a story used to illustrate a person using a product in pursuit of a goal. Scenarios, like personas, are used to better understand how a new artifact will fit into the daily life of a user and to understand the nuances of user behavior.

### Semantics

Semantics is literally the study of meaning; when applied to products, it relates to the implicit meaning found in the physical and formal characteristics of an object. Product semantics are related to language, in that the form of an object and the name of that object can be inexplicably connected in memory.

### Semiotics

Semiotics is, literally, the study of signs. A sign need not be a printed object but instead can include the theoretical understanding of the process of signification. By signifying something (or signing as a verb), humans can communicate meaning, and a sign itself is thought to carry some form of meaning.

### Social Entrepreneurship

A form of business that focuses on multiple bottom lines---both revenue production for the organization itself and social currency development for the world that involves improving some component of the human condition.

### Think Aloud Protocol

Developed by Herb Simon and Allen Newell, Think Aloud Protocol is the most common form of usability evaluation performed on software interfaces. A Think Aloud user study involves having participants use a system and vocalize what they are doing as they are doing it; the transcribed verbalization becomes the protocol, which is then analyzed to determine where the software was problematic.

### Universal Design

Universal Design is a movement that encourages the design of products so that everyone can use them, without regard for physical or age differences. Universal Design is also known as inclusive design, in that it attempts to include all humans.

### Universal Modeling Language (UML)

UML is a modeling language developed to visualize the process of use cases—the set of steps that users go through as they attempt to achieve a goal. It is a method of moving from the narrative ambiguity of scenarios to a more formal wireframe prototype.

### Usability

Usability frequently implies a level of efficiency in designed systems. A usability analysis commonly tracks the number of errors or time on task in an effort to objectify the efficiency the system affords; however, qualitative usability testing can provide insight into the more subjective aspects of product use, such as desirability or pleasure.

### **Use Case**

A use case is a specific and designated path through an interface, usually to accomplish a goal. A test case is used by software developers to ensure bug-free code; a use case is used by usability professionals to track the various ways of using a system.

### Visual Interface Design

Visual Interface Design commonly refers to the aesthetic elements that make a particular interface feel a certain way. This includes the fonts, the colors, and the other subjective elements of the GUI.

### Wicked Problems

An ill-defined form of social problem that has multiple stakeholders with competing goals that affects the most fundamental qualities of human life and that is characterized by its tangled connections to other wicked problems.

### Xerox PARC

PARC, or the Palo Alto Research Center, was the research division of the Xerox Corporation. Many of the computer tools and standards that exist today were developed at PARC in the early 70s.

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"Jon Kolko moves Interaction Design to a new level of analysis with this powerful, thoughtful book. Kolko demonstrates that interaction design impacts all aspects of our lives. That the tools and methods can be used for the solution of social and political issues and not simply for the development of products. This book is essential reading for all who wish to move beyond style to deep, impactful substance."

- DON NORMAN, NIELSEN NORMAN GROUP, AUTHOR OF LIVING WITH COMPLEXITY

"Jon is an important voice in the evolution of interaction design. In Thoughts on Interaction Design, he carefully explains the essential qualities of the discipline and its potential role in world, well beyond the design of user interfaces. If you are concerned with shaping the future, solving big problems and creating things and systems that bring out the best in people, then this book will help you understand and explain how practice of interaction design can help."

 DAVID CRONIN, MANAGING DIRECTOR, INTERACTION DESIGN AT COOPER. CO-AUTHOR OF ABOUT FACE 3RD EDITION

"This is a necessary updating of Jon Kolko's original work; retaining the clarity and accessibility of the first edition but pushing into more areas, as the practices (and the concerns) of interaction design/designers have expanded broadly in the past few years. Jon has the heart of a thought leader and the soul of a teacher, and he offers up a healthy amount of both in this book."

- STEVE PORTIGAL, PRINCIPAL, PORTIGAL CONSULTING





### A COLLECTION OF REFLECTIONS WRITTEN BY JON KOLKO

Some books about design focus on web sites or specific products. Some texts explore the aesthetic and emotional value provided by various elements of design However, there are few texts that explore the semantic connections that live between technology, form and people—"interactions."

Thoughts on Interaction Design offers readers new insights into Interaction Design and the connections between people and technology. Now in its second edition, Jon Kolko's best-selling title builds upon its engaging material aimed to educate Designers, help Designers educate business owners, and legitimize Interaction Design for businesses. This edition explores how changes in the economic climate, an increased connectivity, and an international adoption of technology affect designing for behavior and the nature of design itself. Ultimately, the text exists to provide a definition that encompasses the intellectual facets of the field, the conceptual underpinnings of interaction design as a legitimate human-centered field, and the particular methods used by practitioners in their day-to-day experiences.

Jon Kolko is an Associate Creative Director at frog design and the founder and director of Austin Center for Design (AC4D). He has extensive experience in the professional world of interaction design, working with and around complicated technological constraints in order to solve the problems of Fortune 500 clients. His present research investigates the process of design, with a focus on methods of synthesis used to translate research into insights.

Prior to his work at frog and AC4D, Kolko was a Professor of Interaction and Industrial Design at the Savannah College of Art and Design, where he was instrumental in shaping the interaction and industrial design programs. He has held the position of Editor-in-Chief of interactions, published by the Association for Computing Machinery (ACM), and was formerly on the Board of Directors for the Interaction Design Association (IxDA). He received his Masters degree in Human-Computer Interaction from Carnegie Mellon University, in Pittsburgh, Pennsylvania