While everything, technically, is an experience of some sort, there is something important and special to many experiences that make them worth discussing. In particular,

the elements that contribute to superior experiences are knowable and reproducible, which make them designable.

These elements aren't always obvious and, surely, they aren't always foolproof. So it's important to realize that great experiences can be deliberate, and they are based upon principles that have been proven. This book explores the most important of these principles.

The design of experiences isn't any newer than the recognition of experiences. As a discipline, though, Experience Design is still somewhat in its infancy. Simultaneously having no history (since it is a discipline only recently defined), and the longest history (since it is the culmination of many, ancient disciplines), Experience Design has become newly recognized and named. However, it is really the combination of many previous disciplines; but never before have these disciplines been so interrelated, nor have the possibilities for integrating them into whole solutions been so great.

Experience Design as a discipline is also so new that its very definition is in flux. Many see it only as a field for digital media, while others view it in broad-brush terms that encompass traditional, established, and other such diverse disciplines as theater, graphic design, storytelling, exhibit design, theme-park design, online design, game design, interior design, architecture, and so forth. The list is long enough that the space it describes has not been formally defined.

The most important concept to grasp is that *all* experiences are importar

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—*Where the Boys Are* 1960, Glendon Swathout

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nd that we can learn from them whether they re traditional, physical, or offline experiences; r whether they are digital, online, or other echnological experiences. In fact, we know a great deal about periences and their creation through these other established disciplines that can—d must—be used to develop new solutions. Most technological experiences—cluding digital and, especially, online experiences—have paled in comparison to real-world experiences and have been relatively unsuccessful as a result. What these solutions require first and foremost is an understanding by their developers of what makes a good experience; then to translate these principles, as well as possible, into the desired media without the technology dictating the form of the experience.

This book contains real-world, "offline" examples to counterbalance the online examples so that we can learn from them how to create more successful experiences in new media.

Experiences are the foundation for all life events and form the core of what interactive media have to offer.

One of the most important ways to define an experience is to search its boundaries. While many experiences are ongoing, sometimes even indefinitely, most have edges that define their start, middle, and end. Much like a story (a special and important type of experience), these boundaries help us differentiate meaning, pacing, and completion. Whether it is due to attention span, energy, or emotion, most people cannot continue an experience indefinitely, or they will grow tired, confused, or distracted if an experience—however consistent—doesn't conclude.

At the very least, think of an experience as requiring an **attraction**, an engagement, and a conclusion.

The attraction is necessary to initiate the experience. It can be cognitive, visual, auditory, or a signal to any of our senses. The attraction can be intentional on the part of the experience, not just the experience creator. For example, the attraction for filling-out your taxes is based on a need, and not a flashy introduction. However, there still needs to be cues as to where and how to begin the experience.

The engagement is the experience itself. It needs to be sufficiently different than the surrounding environment of the experience to hold the attention of the experience, as well as cognitively important (or relevant) enough for someone to continue the experience.

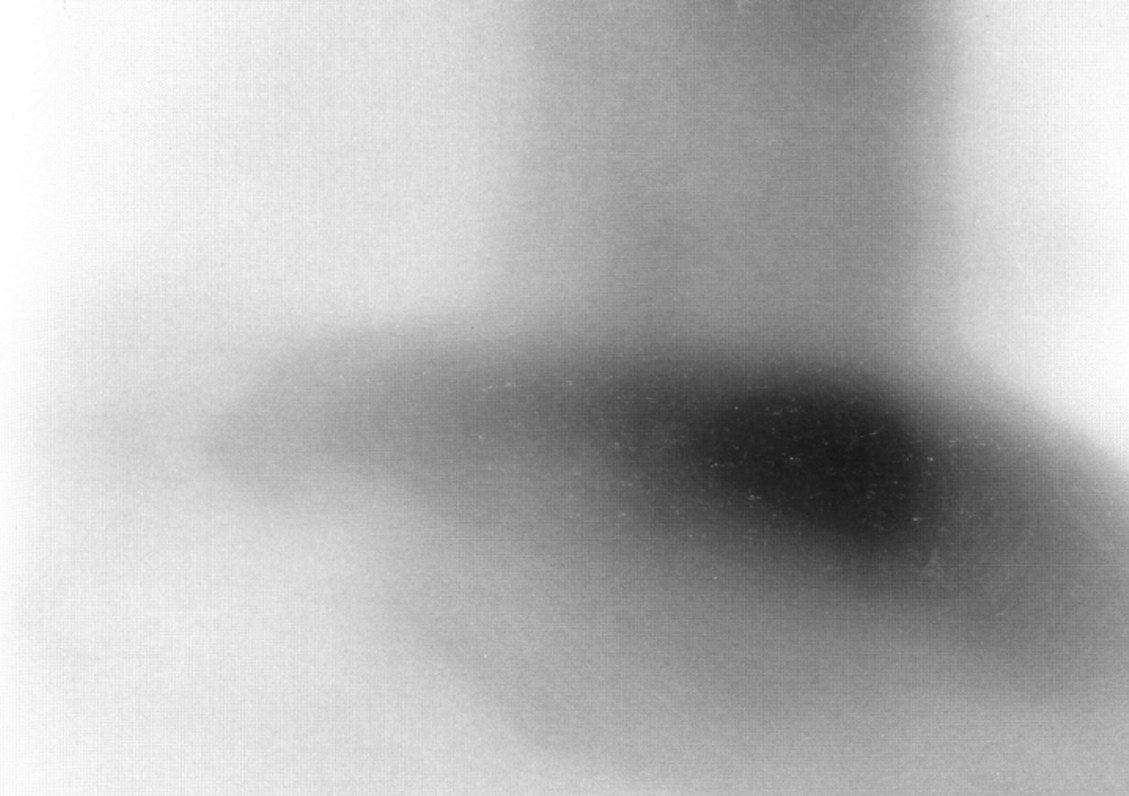
The **conclusion** can come in many ways, but it must provide some sort of resolution, whether through meaning—story or context—or activity to make an otherwise enjoyable experience satisfactory. Often, an experience that is engaging has no real end. This leaves participants dissatisfied or even confused about the experience, the ideas, or the emotions they just felt. An experience creator that does not spend enough (or any) attention on the conclusion—whether through inattention to detail, boredom, or speed—has just wasted his or her effort and the audience's time.

It is possible, and appropriate, for an experience to have an **extension**, which can merely prolong the experience, revive it, or form a bridge to another experience. In this sense, a larger conclusion with greater meaning can be alluded to so that experiences can be elicited. Each experience still needs a satisfactory conclusion on its own level in order to justify more time for further experiences. Hanging your audience completely out to dry will more likely disappoint them than keep their attention for more experiences. Just like serial narratives (such as episodes of television or comic books), all experiences must reward attention at their end.

Experiences are crucial to our lives and our understanding of the world, as well as to our ability to function within it. Indeed, to be creative at all requires a wealth of experience from which to draw. As turn-of-the Century educator John Dewey described in his book *Experience and Education*, there are three natural mental resources: "a store of experiences and facts from which suggestions proceed; promptness, flexibility, and fertility of suggestions; and orderliness, consecutiveness, and appropriateness of what is suggested."

Finally, it is critical to remember that **while all experiences aren't created equally, all must compete for the attention of the audience and participants**.

This means that websites don't just compete with websites, or parties with parties or environments with environments. People searching for experiences—especially if those experiences inform—will choose from various media to meet their needs. One misconception in the digital world has been that CD-ROMs and websites in particular somehow don't need to be as interesting, compelling, or useful as traditional experiences in the same genre—that novelty alone was enough to be successful. What most developers have found is that successful digital media are those that offer experiences unique to their medium and compete with traditional media in usefulness and satisfaction.



"It is not enough to insist upon the necessity of experience, nor even of activity in experience. Everything depends on the *quality* of the experience which is had....

Just as no man lives or dies to himself, so no experience lives or dies to itself. Wholly independent of desire or intent, every experience lives on in further experiences. Hence the central problem of an education based upon experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences."
—John Dewey, *Experience and Education*

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One aspect of an experience that can make it surprising and amazing is that of confronting one's beliefs. When we are challenged to rethink possibilities (when our beliefs and expectations are confronted by the evidence in front of our eyes), we can have a profound reaction.

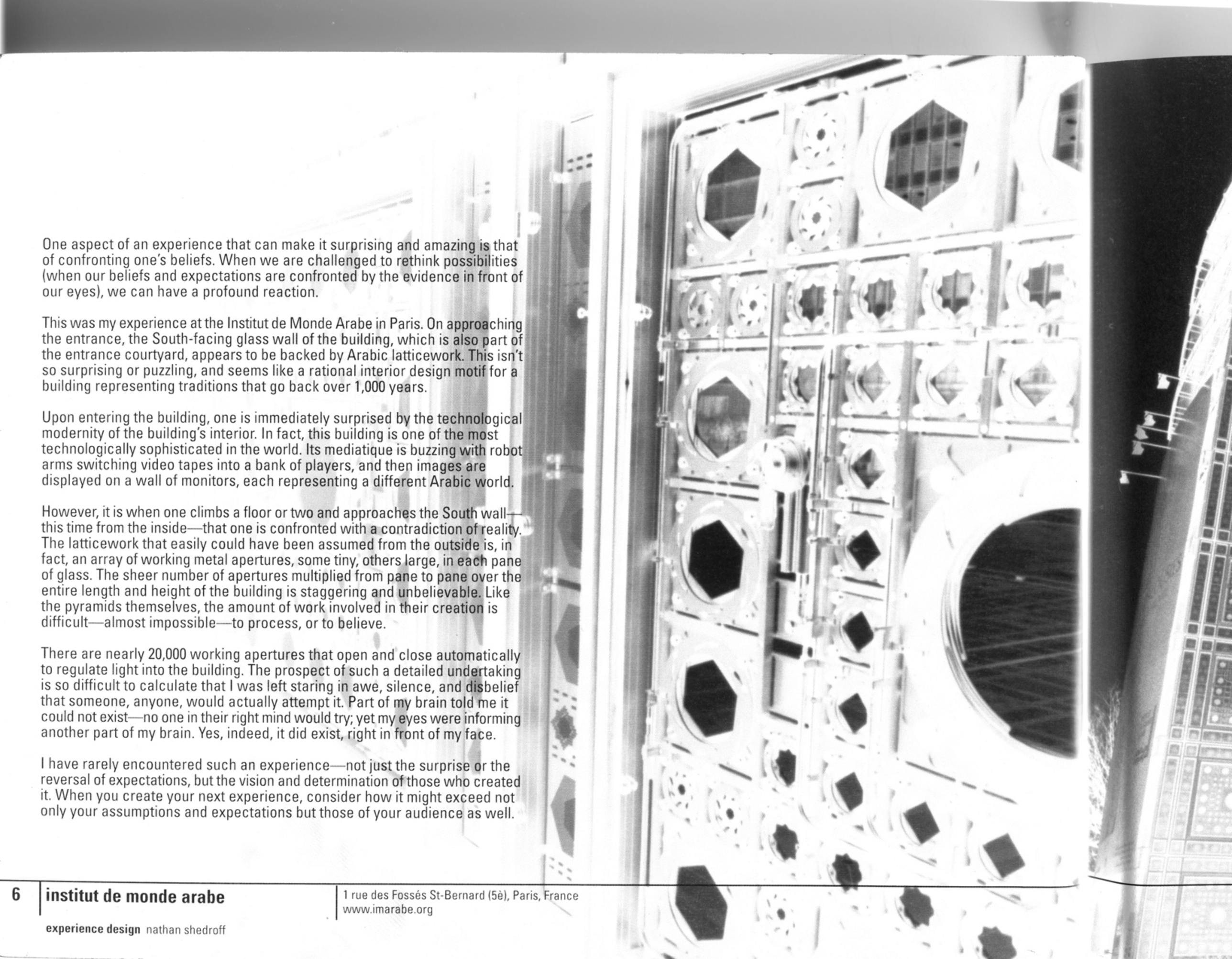
This was my experience at the Institut de Monde Arabe in Paris. On approaching the entrance, the South-facing glass wall of the building, which is also part of the entrance courtyard, appears to be backed by Arabic latticework. This isn't so surprising or puzzling, and seems like a rational interior design motif for a building representing traditions that go back over 1,000 years.

Upon entering the building, one is immediately surprised by the technological modernity of the building's interior. In fact, this building is one of the most technologically sophisticated in the world. Its mediatique is buzzing with robot arms switching video tapes into a bank of players, and then images are displayed on a wall of monitors, each representing a different Arabic world.

However, it is when one climbs a floor or two and approaches the South wall—this time from the inside—that one is confronted with a contradiction of reality. The latticework that easily could have been assumed from the outside is, in fact, an array of working metal apertures, some tiny, others large, in each pane of glass. The sheer number of apertures multiplied from pane to pane over the entire length and height of the building is staggering and unbelievable. Like the pyramids themselves, the amount of work involved in their creation is difficult—almost impossible—to process, or to believe.

There are nearly 20,000 working apertures that open and close automatically to regulate light into the building. The prospect of such a detailed undertaking is so difficult to calculate that I was left staring in awe, silence, and disbelief that someone, anyone, would actually attempt it. Part of my brain told me it could not exist—no one in their right mind would try; yet my eyes were informing another part of my brain. Yes, indeed, it did exist, right in front of my face.

I have rarely encountered such an experience—not just the surprise or the reversal of expectations, but the vision and determination of those who created it. When you create your next experience, consider how it might exceed not only your assumptions and expectations but those of your audience as well.



How many different types of experiences are there? Most likely, the diversity isn't infinite. Functionally, however, the diversity is large enough to define an incredible amount of variety. This variety forms a palette for us to both define and discover what experiences have to offer—that is, what we can learn from them as well as how we can build new variations.

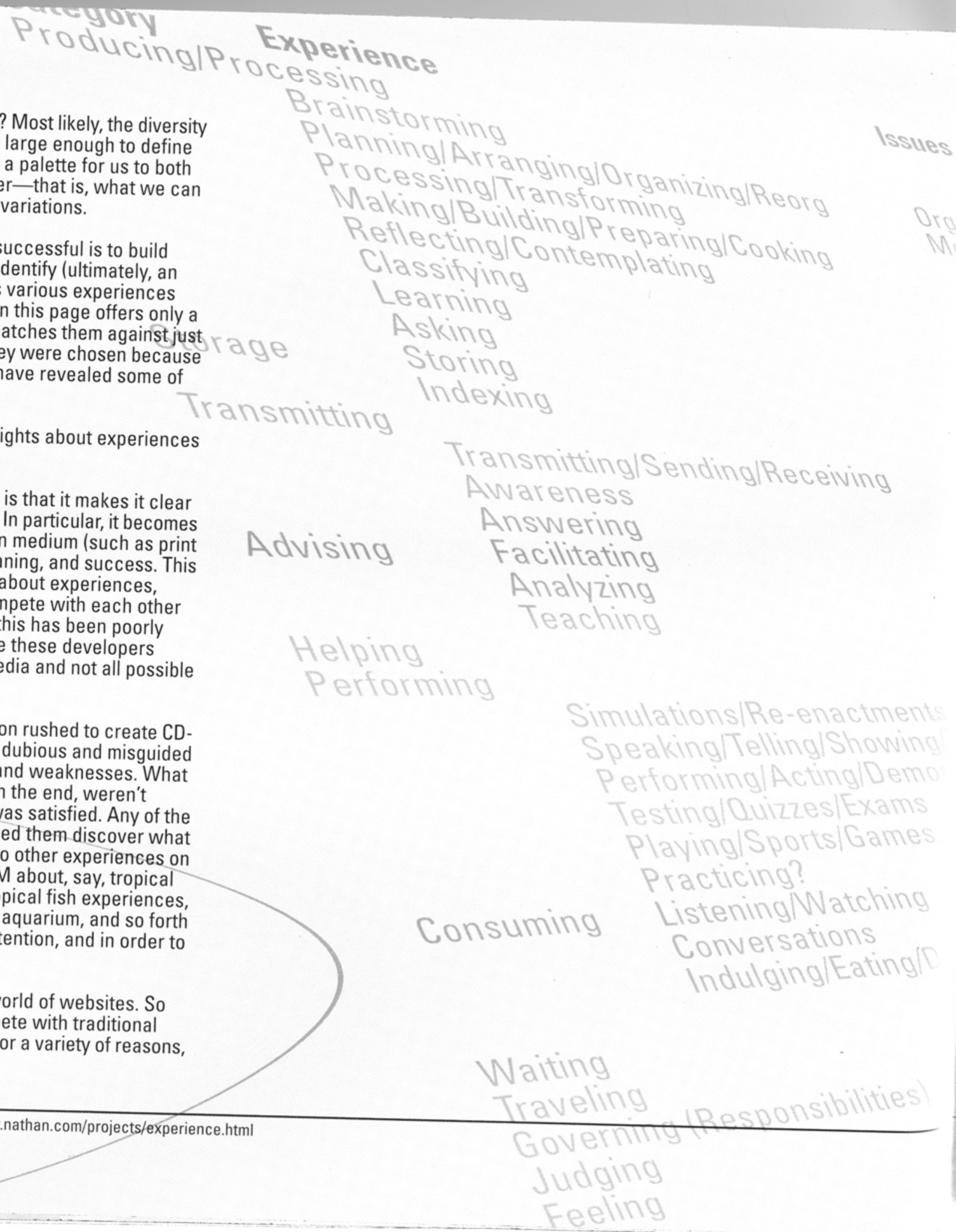
One way to understand what makes experiences successful is to build taxonomies of some the experiences that we can identify (ultimately, an endless list). This allows us to explore what makes various experiences distinct and what makes them special. The chart on this page offers only a few of the possible attributes of experiences and matches them against just a sliver of all the possible experiences. However, they were chosen because they have presented some of the best results and have revealed some of the most important insights.

The best way to explore your own opinions and insights about experiences is to expand this chart yourself.

One of the most apparent values of a chart like this is that it makes it clear how related experiences compare in different ways. In particular, it becomes apparent that many experiences, though different in medium (such as print versus live versus digital) are similar in activity, meaning, and success. This leads to one of the most important understandings about experiences, especially digital ones—that is, all experiences compete with each other on many levels and in different media. Historically, this has been poorly understood by developers of "new media," because these developers assumed that their competition was other similar media and not all possible experiences around that topic or purpose.

For example, developers during the CD-ROM explosion rushed to create CD-ROMs on every conceivable topic—most often with dubious and misguided understandings of interactivity and of its strengths and weaknesses. What they created were mostly exotic experiences that, in the end, weren't successful for their audiences once their curiosity was satisfied. Any of the criteria on an experience taxonomy could have helped them discover what was potentially important about their products next to other experiences on similar topics in other media. For example, a CD-ROM about, say, tropical fish would clearly need to compete against other tropical fish experiences, such as television specials, scuba diving, visiting an aquarium, and so forth on *some* important level to capture an audience's attention, and in order to be successful.

The same phenomenon has occurred in the online world of websites. So many websites that have been created cannot compete with traditional experiences in the same milieu and are failing (often for a variety of reasons, though this is an important contributing one).



Another way to understand experiences is to identify the different media within which they occur. It's easiest, then, to identify the prominent attributes that differentiate products and media. There are no "right" answers here, and the differences in opinion and perception among people vary wildly. You might try discussing these in a group of people to gain an understanding about how media are viewed by others. This is an exercise I often use in classes and presentations, and the conclusions people make are some of the most valuable insights they will ever have.

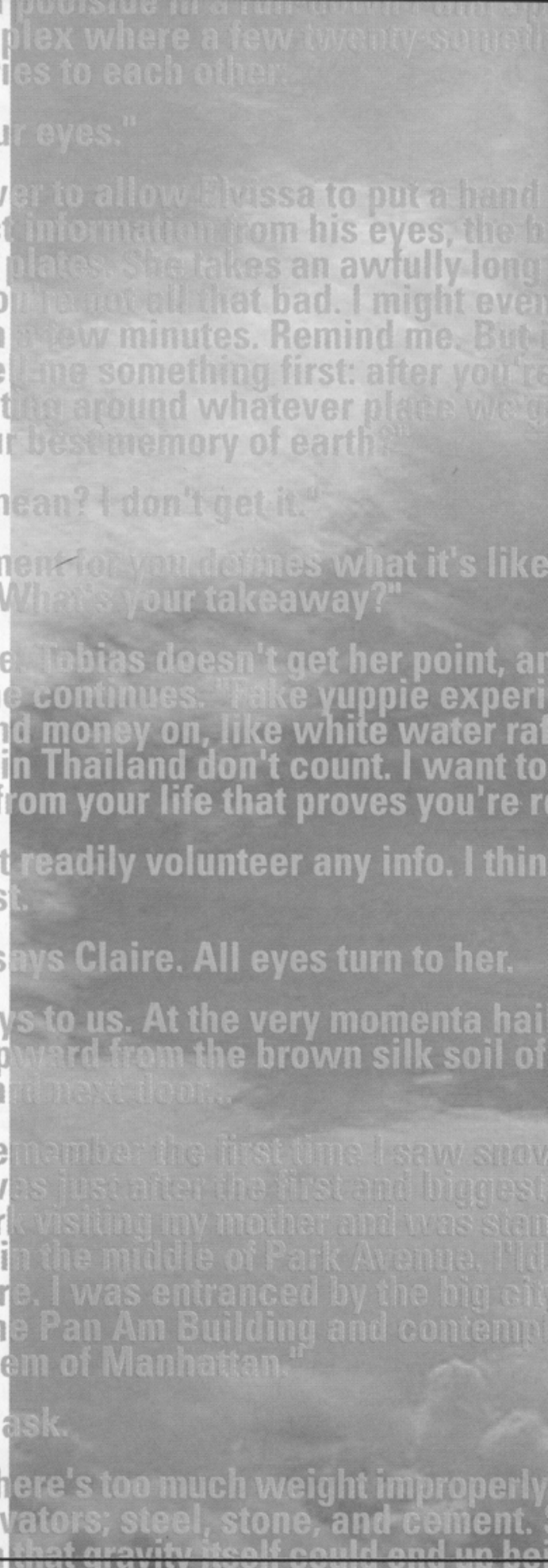
In his novel, *Generation X: Tales for an Accelerated Culture*, author Douglas Coupland describes a "takeaway" as "that one memory of Earth that you'll take away with you when you die that proves that you were alive."

Takeaways are another exercise that helps us derive meaning from the things we experience. Ponder for a moment what memories you have that might qualify as a takeaway. Perhaps you don't have one yet, but you probably have an idea as to what it might be. Think about what is important to you in your life. What will you remember? What makes your life worth living?

It's likely that your takeaway doesn't involve technology—few people's do; most likely, it doesn't involve media like TV or radio either. It just may be that technological experiences are sufficiently mediated so that they become less direct and, therefore, more difficult to become important. Perhaps it's because technological and media experiences are so often reproduced, their rarity or specialness is lessened.

In any case, it's useful to deconstruct the meaning of these important experiences in order to understand why they are so important to us. In fact, these attributes are some of the most important we can discover and, hopefully, reproduce in the experiences we create for others. Transformative experiences, those that help people change in some way that is important to them, are typically good for measuring value.

Some of the attributes we have uncovered appear on the following pages—especially those in the Interaction Design section. However, these are only the tip of the experiential iceberg. It is up to you to discover and explore more.



28 | takeaways

experience design nathan shedroff

Generation X: Tales for an Accelerated Culture
isbn: 031205436X
www.coupland.com

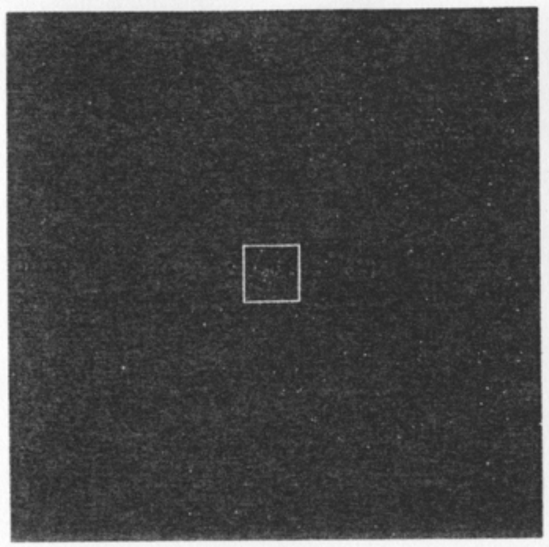
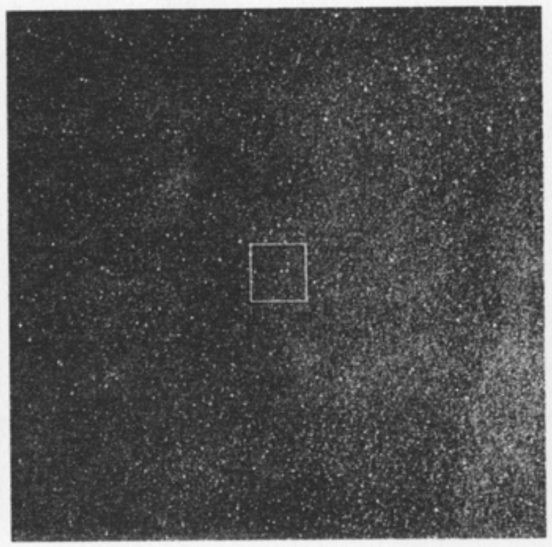
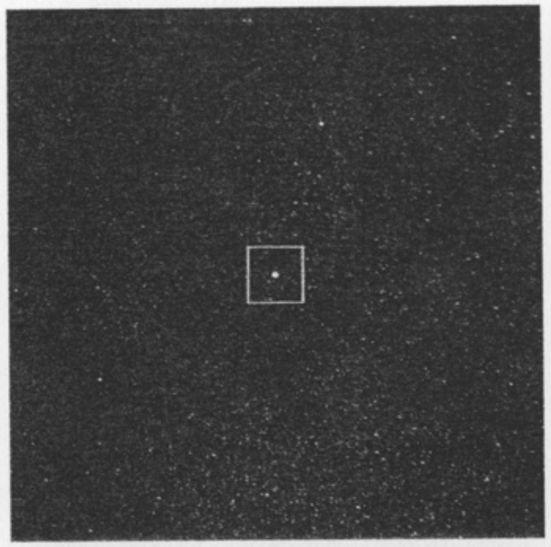
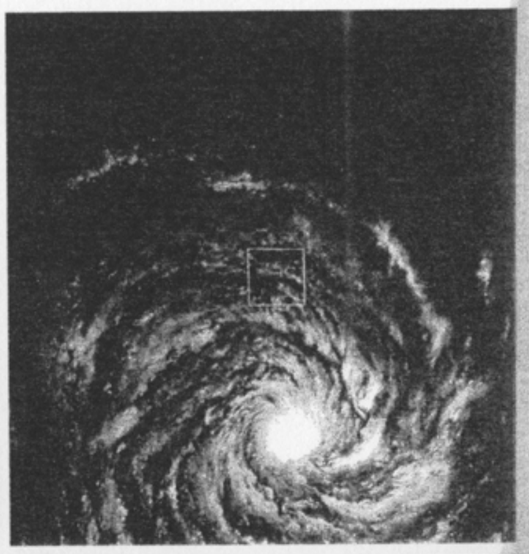
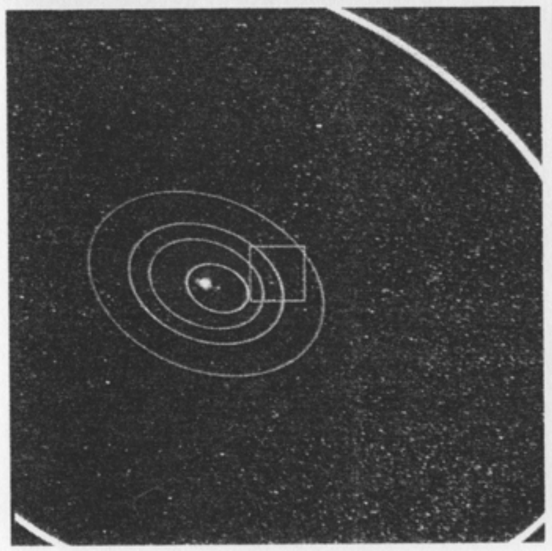
The most important aspect of any design is how it is understood in the minds of the audience.

This concept, whether fully or partially formed, is a **cognitive model**. Everyone forms cognitive models for nearly everything they encounter—particularly those things they interact with repeatedly, or those things that we focus on because they are important to us. Some people are more adept at forming cognitive models than others, and these facilities also differ between people in their type of understanding—that is, some people form understandings textually, visually, aurally, temporally, geographically, and so forth. In any case, the form of the experience is what gives it meaning since this is what people experience directly.

Whether or not you focus on creating a cognitive model for your experience, your participants will nonetheless. They might form a mental map of the sequence or process or location. It might be of their feelings, or merely a randomly strung together list of memories of their experiences. What's important, however, is whether you want or need them to remember the experience well enough to follow directions, repeat it, recount it, or duplicate it. Much of education is about creating mental models for students to use and follow.

New cognitive models can often revolutionize an audience's understanding of data, information, or an experience by helping them understand and reorganize things they previously understood (or, perhaps, couldn't understand), in a way that illuminates the topic or experience.

To create meaningful cognitive models, consider the ways in which you want your audience to find meaning and what you want them to remember. In most cases, you will need to choose one form for the overall experience (like the sequence of a book, play, or music, or the layout of a party, theme park, or building). There are no *right* answers to this one form, but you would be wise to explore different forms before settling on one (see *Information* on page 42 and *Multiplicity* on page 72). Of course, this form won't work best for everybody, so when it's important—and possible—create other ways of moving through the experience that allows others to form a mental map in a way that better suits them. Also, be wary of mental models that constrain your experience or cause cognitive disonance (when the mental map formed doesn't conform well to the reality of the experience) for your participants (see *Metaphors* on page 102).


There have been few descriptions of our universe as powerful and astounding as the film *Powers of 10* made by Charles and Ray Eames and Phyllis and Phillip Morrison (now also a book). The size of the Universe and that of the atom are difficult for most people to grasp since these numbers are so vastly large and small (respectively); and, we have little way to relate them to what we can experience directly (the major way we create understandings).

This film takes us on a journey from 1 meter off the Earth's surface to the edges of the Universe—not in a direct or algebraic line (a journey that would be impossibly long) but an exponential one. In other words, instead of presenting pictures back toward the Earth at every meter thereafter, we see views that increase exponentially from one meter to 10 to 100 to 1000 etc., finally stopping at nearly one billion light years from the Earth.

Likewise, the second half of this journey takes us into increasingly smaller views (starting at the same point one meter above the surface of the Earth) until we move inside the body, its organs, its cells, its organelles, its molecules, its atoms, and finally to the smallest edge of our understandings of the physical Universe: inside sub-atomic particles.

The film (and book) use this linear organization with constant intervals of distanc to help us form a cognitive model of the relative sizes of the things we understan (and don't yet) in terms that we can begin to understand.

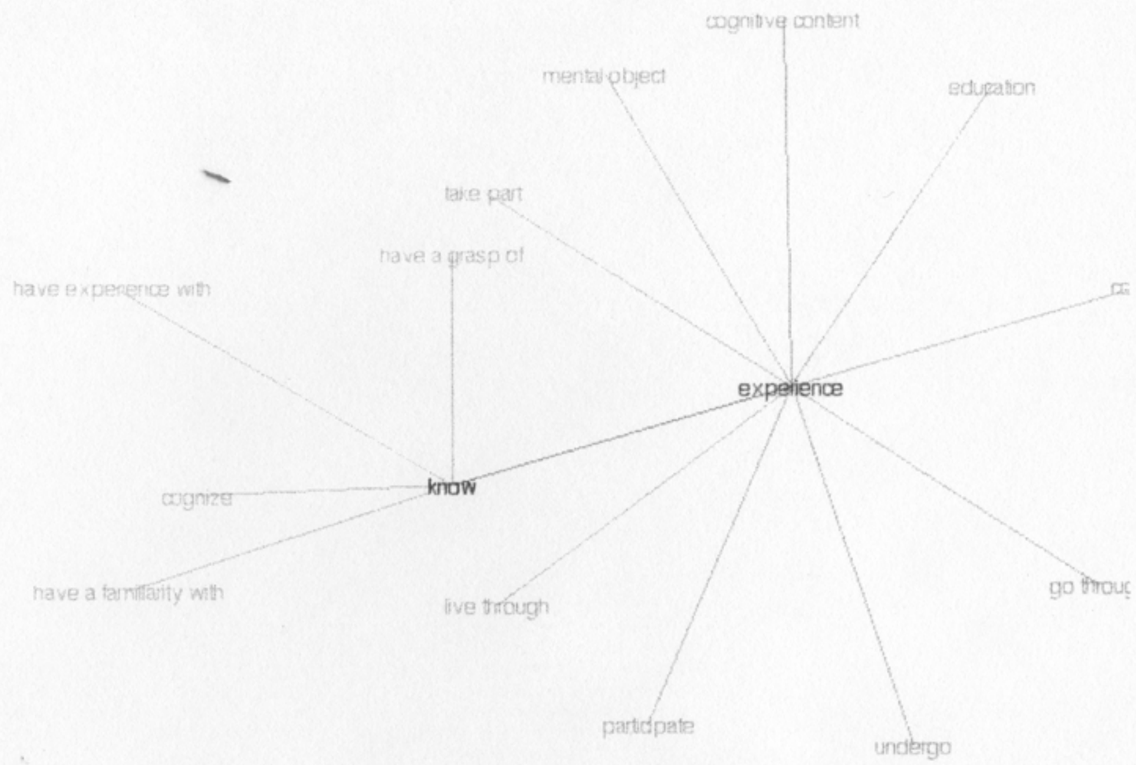
One of the most important, and unexpected, observations isn't how big or small things are, but that certain repeating patterns of vast emptiness and packed activi are almost constant from the sub-sub-sub atomic to the largest conceivable astronomical bodies. These kind of relationships draw conclusions about the natu of the Universe and even how we perceive, and these revelations also lead to a formation of a cognitive model for the Universe that anyone can understand.

isbn: 0716760088
www.eamesoffice.com/powers_of_ten/powers_of_ten.html

creators: Phillip and Phyllis Morrison and Charles and Ray Eames
first published in 1968

experience design nathan shedroff

plumb design



Sometimes the best cognitive models aren't aligned with known objects (as with metaphors) or environments (as with maps), but are abstract and reduce meaning to a more pure state. The Plumbdesign Thinkmap system is a diagramming system that relates terms, objects, or elements to each other in an abstract and cognitively reduced way. One of the effects of this is that there are no other meanings overlaid onto the cognitive space, and the cognitive model and presentation are aligned perfectly. Of course, this isn't necessarily the best solution for every use but, when it is, there are no more seductive presentations of these cognitive maps than the Thinkmap diagrams.

One of the most difficult concepts for designers to understand is that **the presentation of an experience or design (its appearance) is separate from its organization.**

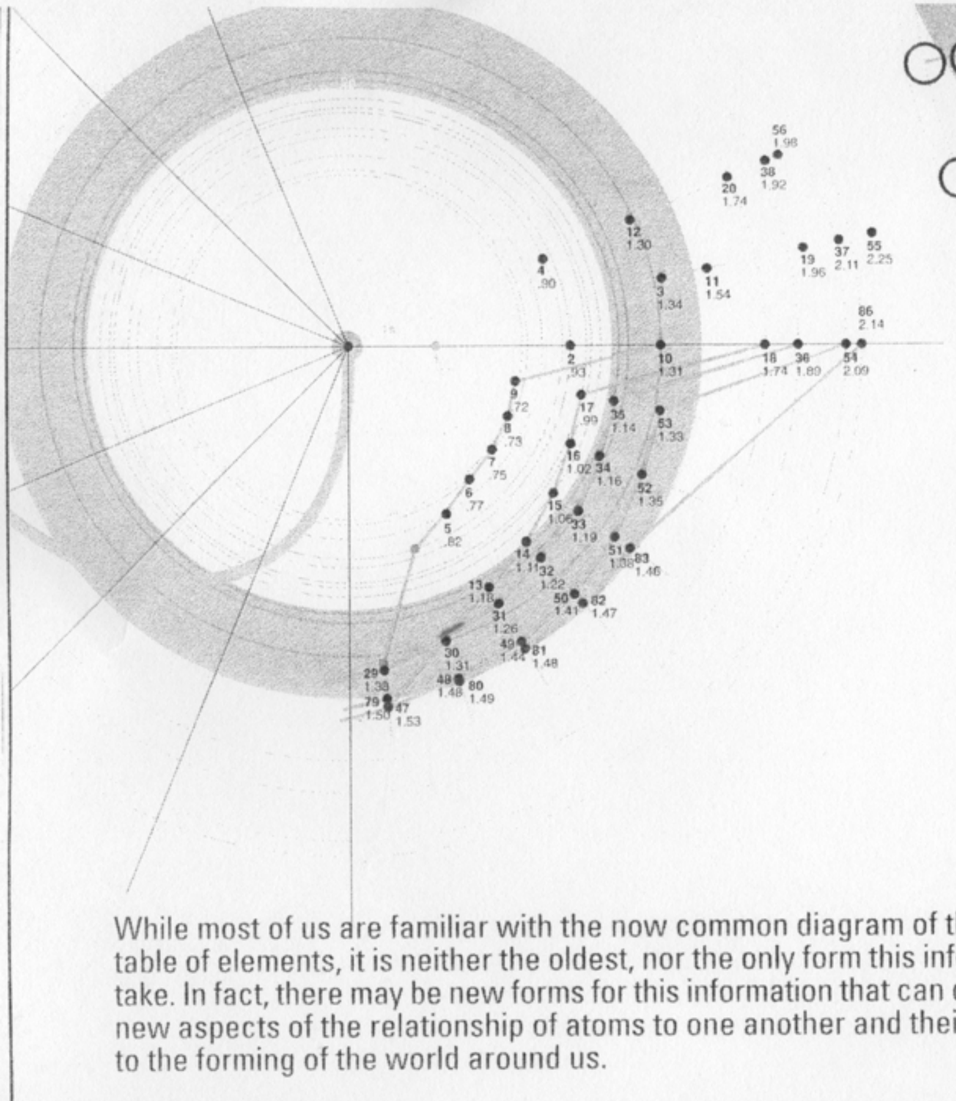
Often, these are so tightly coupled or so commonly combined that we can't imagine a particular organization presented in any other way (geographic information, for example, presented as maps). However, the most common taxonomies for presenting information aren't always the most successful.

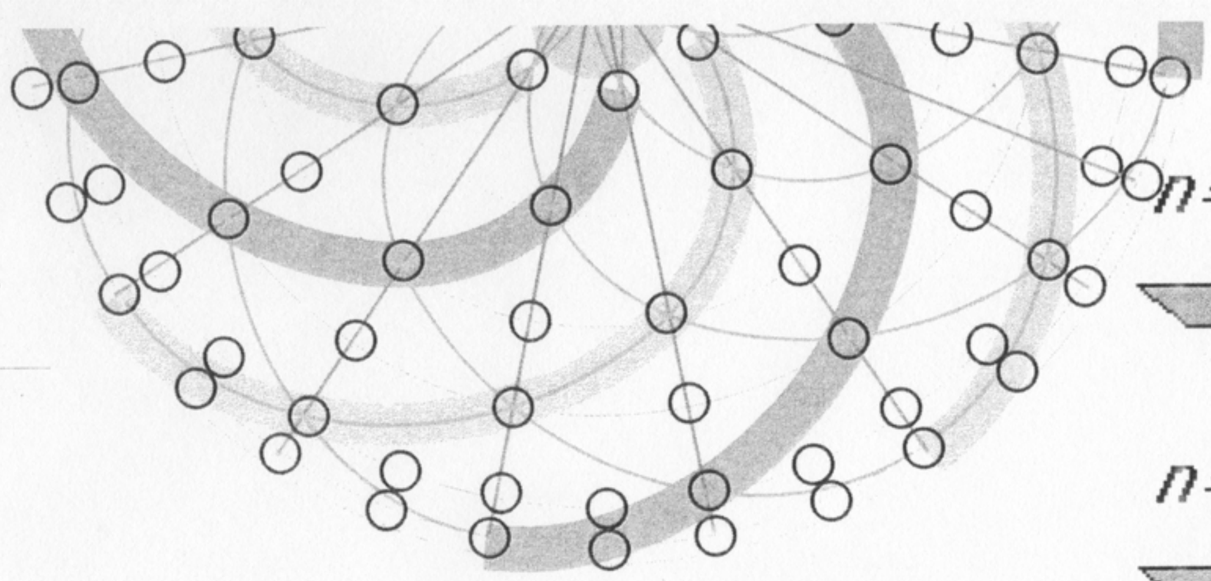
Almost any organization can be presented in a variety of ways. Textual data (words or numbers) can be presented in writing (such as a description), visually (as in any variety of charts), or aurally (as in live or recorded speaking), or in any combination.

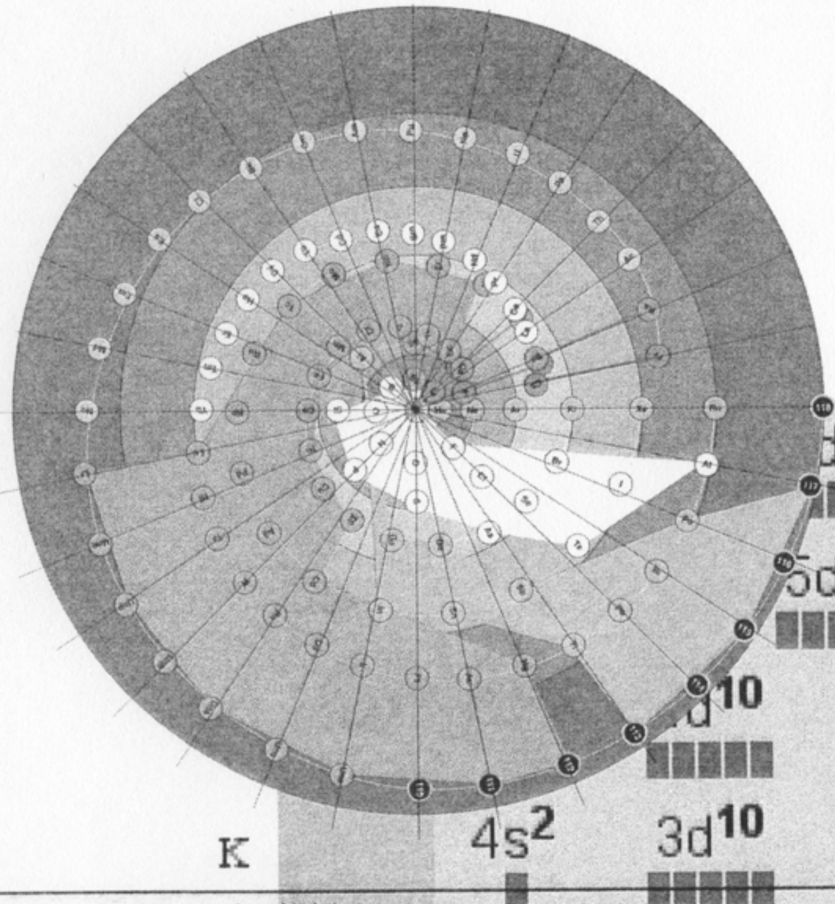
Even map data can be presented in all of these ways. Consider driving directions to a house. The organization of the data most likely will be time and location (specifically, locations over time in an efficient route). However, these directions can be written into a descriptive paragraph, listed in a bulleted list, charted as a map in any of a variety of forms and projections, or recorded in sequence as an audio tape to be played in real time.

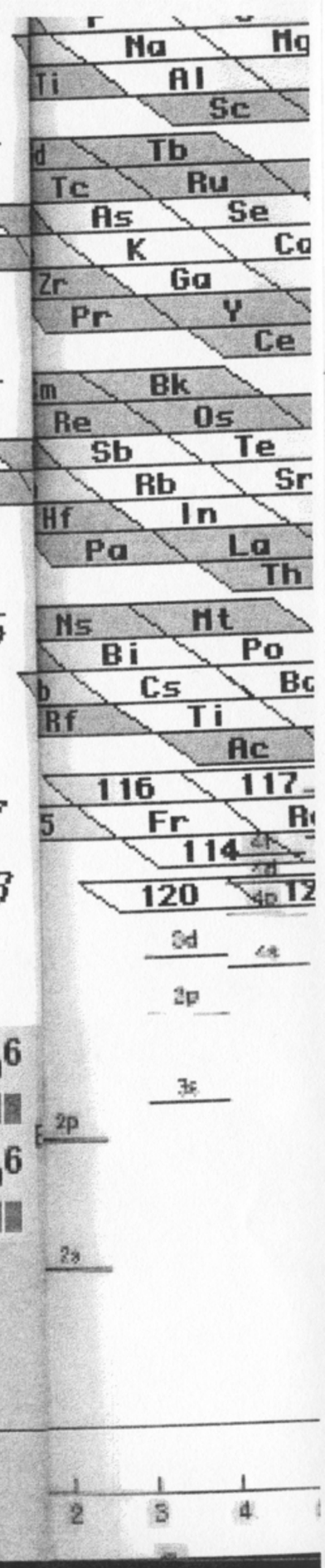
Often, the presentation itself affects our understanding so much that we can misunderstand or misinterpret the data.

This is often the case with political or legal presentations in which it is more important to the presentation's creators to incite a particular opinion than it is to be accurate. This is how propaganda and disinformation are formed. Unfortunately, it's often the outcome of visual design work since most designers value visual style and appearance over understanding and accuracy (whether they realize it or not). While designers are *supposed* to bring something new and unique to the design process—often something unexpected or previously considered unrelated; sometimes these inspirational elements really aren't appropriate, or they are implemented in a way that obscures everything *but* the style.









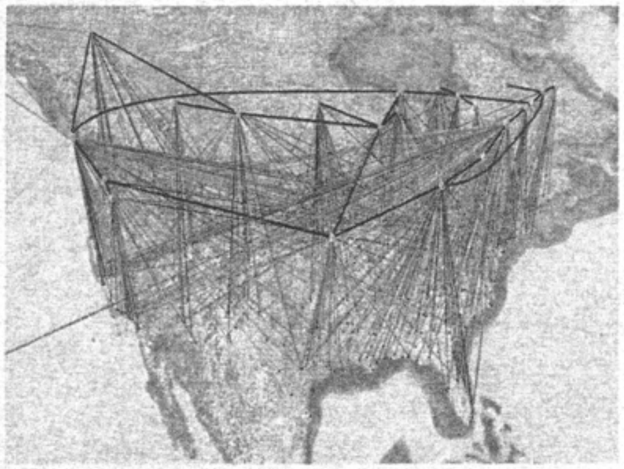
While most of us are familiar with the now common diagram of the periodic table of elements, it is neither the oldest, nor the only form this information can take. In fact, there may be new forms for this information that can communicate new aspects of the relationship of atoms to one another and their importance to the forming of the world around us.

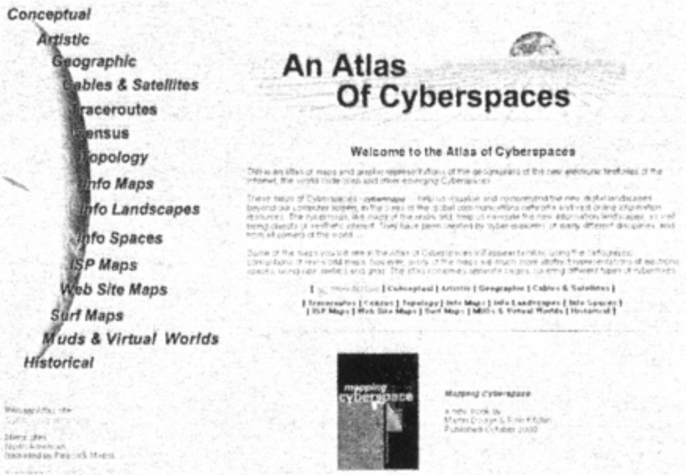
The periodic table that we have come to know has evolved over centuries as physicists have tried to make sense of the data they've observed about fundamental elements and atoms. The diagram has morphed in unexpected, novel ways (circles, figure-eights, even three-dimensionally) in order to explain and reconcile the seemingly inconsistent data generated by increasingly sophisticated measurements. The largest of these diagrams presented here is my own, latest attempt to describe the relationship of elements in terms of the positions of their electrons and nuclei—literally the shape of the atoms themselves. (Although this is based on some still controversial opinions about the shape of atoms.)

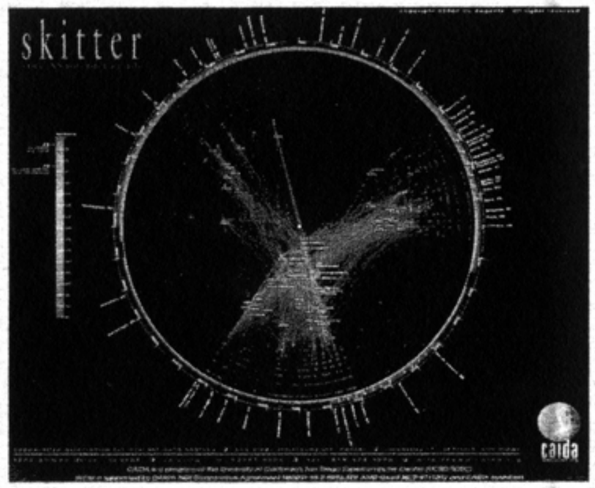
It's always important to explore new ways of seeing and describing common phenomena as these explorations help us develop better understandings of what we have yet to know. All of these diagrams, in fact, are wrong—and always have been—though they have been the best explanations we've had to date.

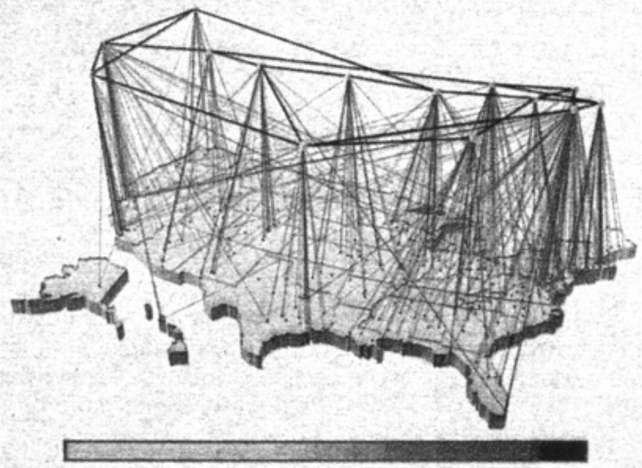
You can explore the periodic table of the elements at www.chemicalelements.com. Models developed by Dr. Timmothy Stowe, Thoedor Benfey, Emil Zmaczynski, and Nathan Shedroff

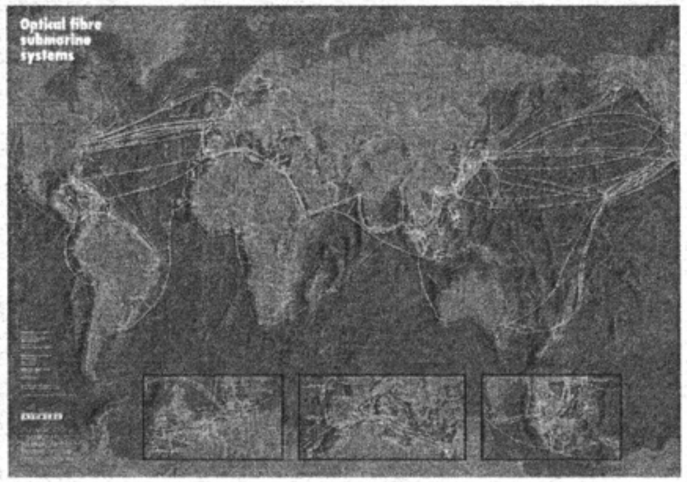
experience design nathan shedroff

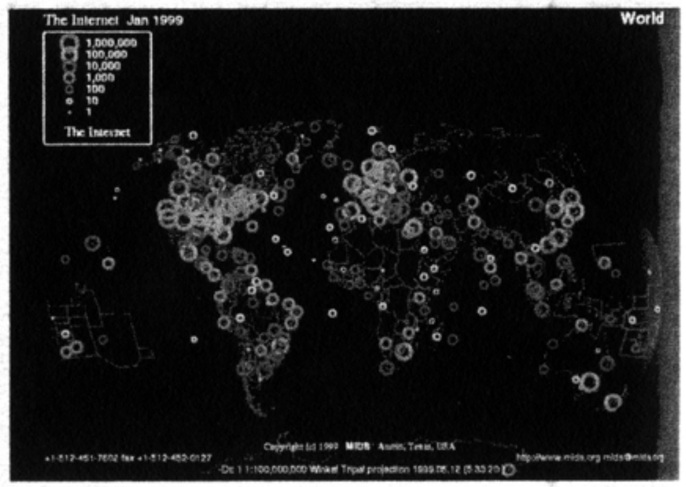


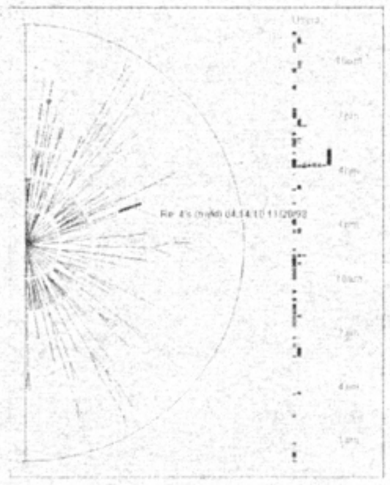


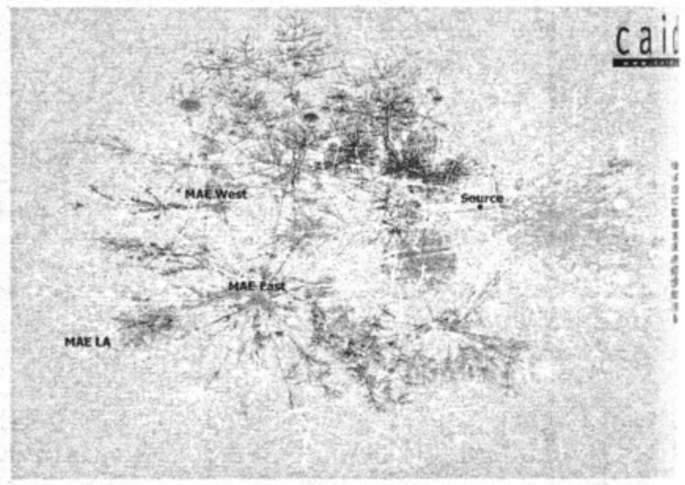












There are many ways to view the same thing, though we often become so accustomed to certain, standard views that we take the possibilities for granted and forget to even expect alternatives.

This site contains a wealth of maps in a variety of forms that all describe, essentially, the same thing: the size and activity of the Internet. This variety reminds us to search for new—and better—ways to visualize and describe what we're trying to communicate.

book: *Mapping Cyberspace* by Martin Dodge and Robert Kitchin
isbn: 0-415-19884-4
www.mappingcyberspace.com

Key to the development of cognitive models is the diversity of people's learning styles and abilities, as well as the complexity and depth of data in many circumstances. This is what creates the need for multiplicity in organizational schemes, both in redundant and alternative organizations as well as in deeper levels of organization that are layered onto higher-level organization to make an experience clear.

Multiple views and other redundancies may seem like a waste of time and resources, but the duplication is critical to creating understanding for a variety of people.

Since everyone has different skills and experience, no one wa organizing data is capable of creating understanding for every

Varying organizations and presentations allow each person to best find his or her way. Examples of these multiple points of entry into content are book indexes and building signage. In search interfaces, they allow for multiple search criteria, including browsing, which itself is an alternative to searching.

Multiple organizations also support multiple points of view. In some interfaces, different paths that support different organizations clearly allow and shape different understandings in a body of content. This can create an opportunity

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for richer understanding since conflicting perspectives often can lead to deeper thought and more consideration when forming not only opinions and understandings, but cognitive models as well.

Most complex data require several levels of organization, varying the form of organization at each level to suit the content. Encyclopedia, guidebooks, and directories, for example, often nest their organizations. Directories might first list items by location, then by quality (or some other magnitude), and then alphabetically. These levels help break the data into meaningful chunks that can be navigated more easily. They also reflect and *create* hierarchies of importance and priorities, and thus, meaning.

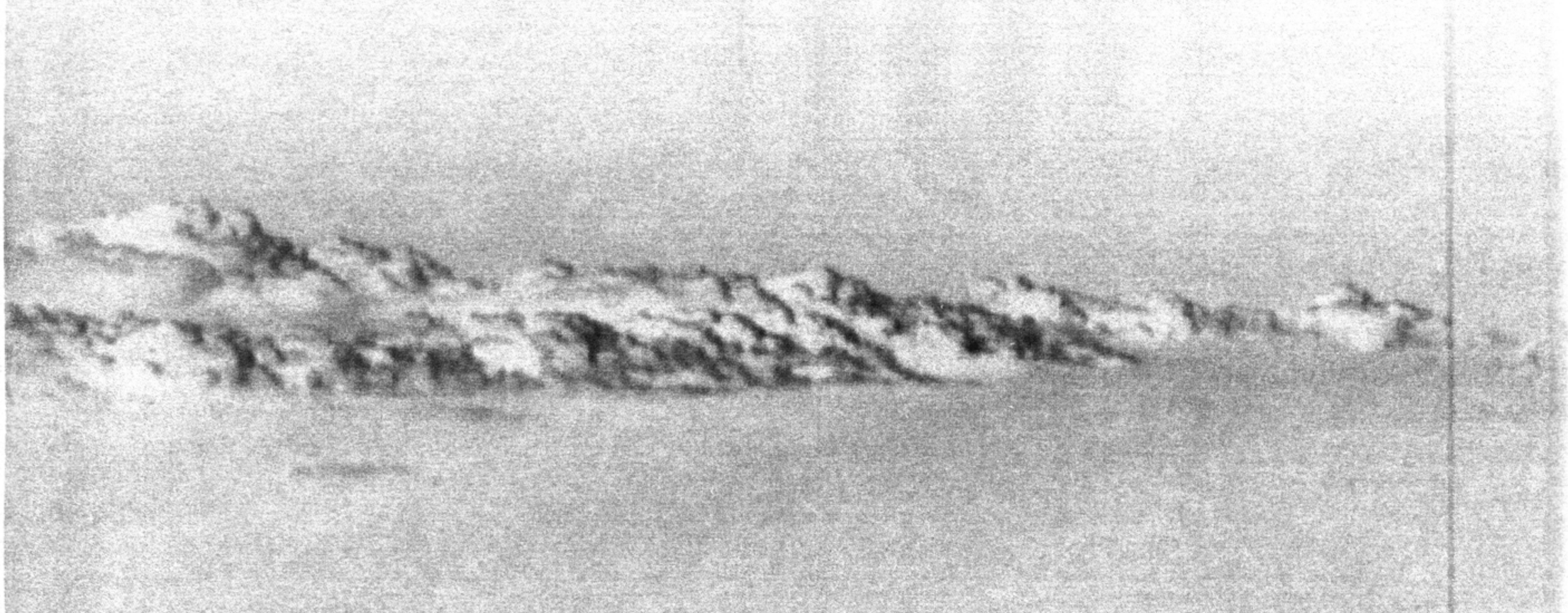
Lastly, multiple levels of organization create a hierarchy for reading as well as importance. It's advisable, then, that the most important meaning (however this is deemed), also be the most evident (whether on a page or screen). In other words, importance should be reflected in obviousness, or at least, ease of reading. Likewise, the second level of importance should be reflected in the next apparent data and organization, and so on. Unfortunately, many designs often use style to mask the hierarchy of importance thereby decoupling this relationship, making it more difficult to navigate as well as understand the meaning of the content itself.

There is no such thing as objectivity.

As much as we would like to believe otherwise and for all the repeating of this mantra in our educational system, it simply isn't true. Every part of the process of communicating is subject to the values, perspectives, and understandings of those creating the content.

This doesn't mean that we can't make a point of trying to be "objective," or more accurately, to present meaning with as little hyperbole and sensationalism as possible. Indeed, the best understandings are formed from presentations of differing, balanced views and opinions. What this means, however, is that even acts as simple and seemingly innocent as organizing data are subjective. Indeed, organizing data and the creating of information may have a profound impact on its meaning.

Even the documents that we think of as so basic that they are free of subjectivity, are actually rife with it. Dictionaries, for example, are organized simply (alphabetically), but the words themselves—as well as their meanings—are included through an often highly subjective process. This isn't necessarily bad. Subjectivity is necessary for the communication of opinion and personal stories. The problem arises only when we deny the existence of subjectivity at all levels (including the deepest and most "basic") of communication.



Metaphors are one way to build a *cognitive model* (see page 60), and they can be very powerful in orienting people to help them understand an experience; but they can be equally disastrous if they aren't applied well. Metaphors use references to already known experiences as clues to new ones. The "desktop" metaphor of most personal computer operating systems is an attempt to help people create and use files, store and arrange them, delete them, and work with them. It has mostly worked well, but only because the metaphor isn't totally consistent with the real experience—the operating system doesn't *really* work like a person's desk. Too close of an adherence to the theme either limits the functions of the system, or creates confusion when the two don't work together consistently.

In actuality, most metaphors used in this sense are actually similes. The difference is subtle but was astutely pointed out by Brenda Laurel in her book *Computers as Theater*. It's worth noting in the context of experience design because it is possible to design experiences that are true metaphors. New devices and unique, playful theater or product experiences can actually redirect interaction with one object into manipulations of another. Whereas before a computer interface might visually represent the directory file system on its hard drive *as if* it were a desktop, in reality the two were not the same. However, researchers and designers are experimenting with objects that can behave metaphorically. Your imagination can open you up to the possibilities. A theme park like Disney's *Epcot Center* is a metaphor for the whole world, as Disney's new *California Experience* theme park is for the State.

Metaphors are not required and can be crutches for poor ideas and design. Used well, however, they can be illuminating for users and quickly orient them to the functions and interactions of an experience.

Computers as Theater, Brenda Laurel, Addison-Wesley, 1991, isbn 081011313
disneyland.disney.go.com/disneylandresort/CaliforniaAdventure/
asp.disney.go.com/disneyworld/db/seetheworld/themeparks/facilities_epcot/index.asp?id=47

People find meaning in experiences and things based on a wide variety of personal values. *That* people find meaning in things is, perhaps, the only constant that can be relied upon.

To this end, it's important to design experiences so that audiences or participants *can* find meaning in them by making connections to their own lives and values—that is, if we want these experiences to have lasting impact.

Meaning is often built by objects and experiences that allow us to grow or experience intense emotions. Not every experience should, necessarily, have this as a goal but, often, the distinction of a successful or memorable experience is that it transforms us or makes us feel something. **Artifacts** of an experience (physical objects from the experience that serve as reminders of what we experienced, such as photographs and souvenirs) become valuable to us because they serve to remind us and help us relive those experiences.

Certainly, art does this and often with varying results. While older forms of art often relied on technical capabilities (e.g., photography) to stimulate our interest by reproducing nature, modern art (e.g., videography) must stimulate our thoughts with ideas in order to leave a lasting impression. These experiences have their most success when they have the most meaning for us. I'm sure you've seen art that you couldn't understand or didn't find accessible. These artworks fail for us because they haven't created meaning. It is the bane of an artist or designer to try to touch all people on a personal level since everyone's context is so varied and intimate. However, it is the best artists and designers that, at least, attempt to communicate with their audiences on this level.

Interaction design is a discipline that specifically focuses on the interactivity between an experience and its audience. It's not that interaction designers ignore information design, visual design, or other principles, it is that they specifically focus on experiences with complex interactions that tax users. Interaction design is relatively new and undocumented but growing as more interaction designers tackle and document their success and failures.

Overall experiences are usually more all encompassing than we first recognized. For example, consider the experience of shopping. To understand it from the perspective technologists usually take, shopping is merely the act of comparing product specifications until we're ready to make a purchase. But shopping as we know it in the real world is a complex, much more rewarding experience. In fact, the act of shopping usually begins before we even realize it—often before we perceive the need for something—and doesn't end until we finally discard and/or replace the product. Interaction designers are concerned with this distinction and are interested in exploring the complexity of real experiences in order to create new interactions that compare in richness and complexity, not merely in features.

Interactivity is nothing new.

People have been interacting for as long as they've existed. What *is* new is that we consider it possible for computers to be interactive—that is, people can truly interact with computers and related technologies, rather than just use them.

Interactivity is not so much a definable thing as it is a nebulous concept. It is a spectrum from passive to interactive; and, there's no distinct point along the continuum where an experience switches from passive to interactive. In fact, it's probably only possible to compare experiences as being more or less interactive, rather than interactive in and of themselves.

In an interactive medium, it would seem that interactivity would be important, but the issues over the past few years have revolved around almost everything *but* interaction: content, technology, bandwidth, connectivity, politics, security, and so on. Even those who claim to understand interaction usually produce merely dynamic media (such as animation) rather than interactive experiences.

Interactivity is *the* differentiable advantage of interactive media.

We have had multimedia for a long time (in print and television, for example), but what is different now is **interactivity**. Technologies are not inherently or automatically interactive. They must be made so through a careful development process that makes a place for the audience (users) to take part in the action. Products and experiences in these media that aren't truly interactive won't be successful because the medium isn't being used to its advantage. (For example, using the interactive media to broadcast content or recreate traditional passive media experiences like television.) Television will always be better at being television than the Web or any other interactive media.

The biggest problem with the term *interactive* is that it has been misused by too many companies and people, as the term has been generally accepted as meaning either animation (which is an old passive medium), or anything that appears on a computer or on the Web since these are "interactive media." Unfortunately, these definitions are not only incorrect but misguided in how narrowly they look at activities. Interactivity encompasses everything that we do, not just that which we do on or with computers. In fact, most interactive experiences in our lives have nothing to do with technology. Playing sports or other games, hobbies, and work are more interactive than computers have been able to address. Probably the most interactive experiences in your life will be great conversations.

What's important to understand is that **everyone already creates inte** for themselves and others, we just don't think about it. However, we already know a great deal about interactivity from which we can draw experiences, processes, and techniques for creating computer-based interactivity.

Interactivity is also comprised of many other attributes. Some of these include feedback, control, creativity, adaptivity, productivity, communications, and so forth. Many of these attributes are also valuable experiences (certainly creativity and productivity); and, correspondingly, interactive experiences that contain these attributes are highly valued when designed well. Interactivity isn't necessarily better, but it usually does correspond with higher involvement by an audience.

On a philosophical level, **interaction** is a process of continual **action** and **reaction** between two parties (whether living or machine). It is debatable whether or not a computer is capable of actually initiating action rather than merely reacting through its programming. This controversy about action and initiation is one of the deepest issues for interactivity, and may represent one of the key differences between animals (including humans) and machines. As we continue to explore this issue, the answers we find may guide us in creating experiences that are more interactive and successful than what has been created to date.

feedback

control

creativity

interactive>>>

productivity

communications

adaptivity

interaction: a cyclic process in which two actors alternately listen, think, and speak. -Chris Crawford

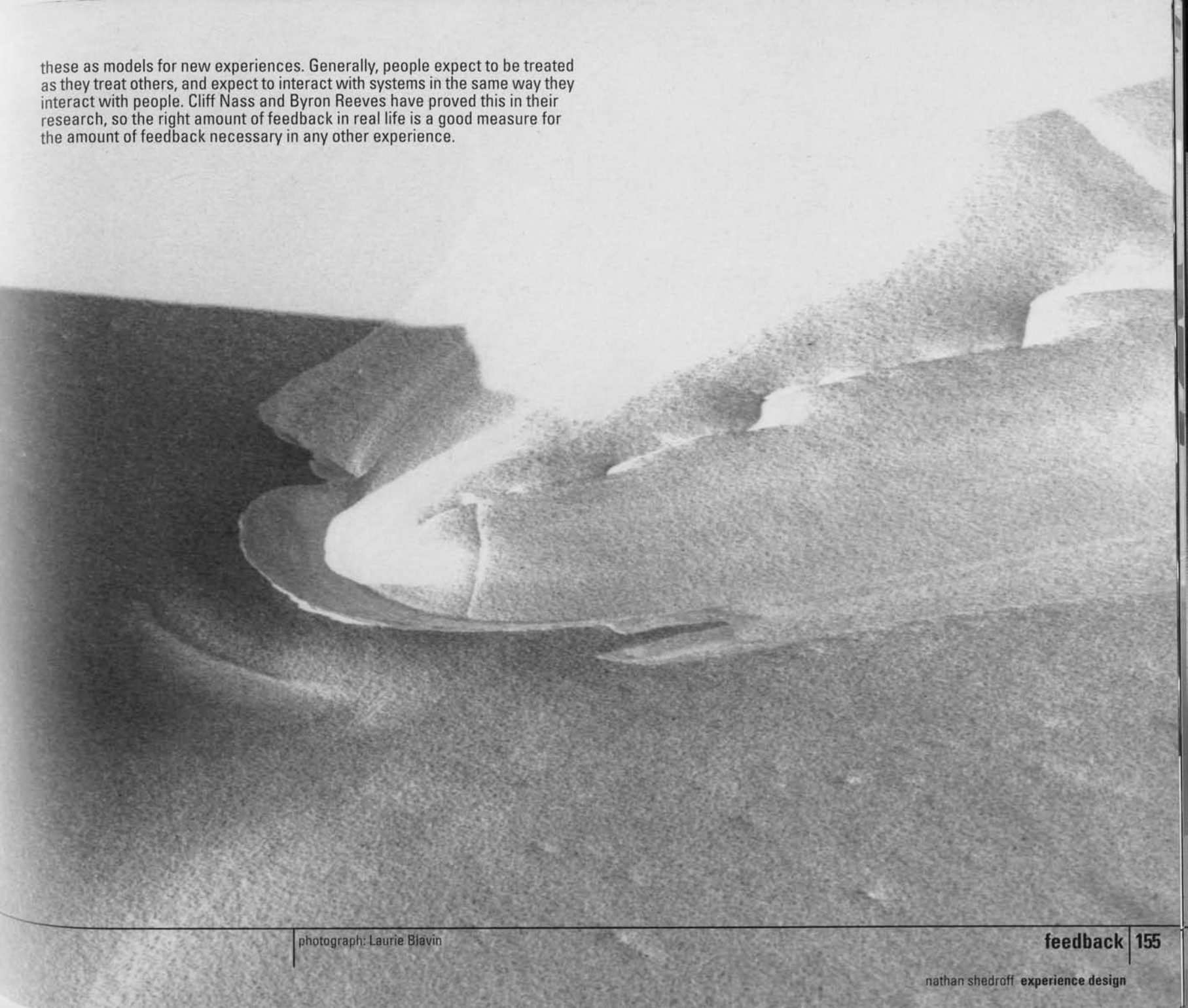
Understanding Interactivity
www.erasmatazz.com/book.html

An experience that tells us something about itself tends to feel more interactive than ones that don't. Whether the feedback is a simple explanation about why you are waiting, a reaction to some user action, or a detailed accounting of the system's performance, most people expect experiences to acknowledge their actions in some way. It's important to give just the right amount of feedback because too little may not be helpful or frustrating, and too much may be overbearing and distracting.

If your participants become confused about what's happening, they probably need some feedback to their actions—unless, of course, confusion is the goal of the experience.

Different experiences demand different rates of feedback. Games, for example (whether computer-based or not), require a great deal of feedback to keep the action moving. Relaxing experiences, on the other hand, require very little feedback in order to be successful. When designing experiences, it's always best to keep in mind real-world, physical experiences among people and use

these as models for new experiences. Generally, people expect to be treated as they treat others, and expect to interact with systems in the same way they interact with people. Cliff Nass and Byron Reeves have proved this in their research, so the right amount of feedback in real life is a good measure for the amount of feedback necessary in any other experience.



photograph: Laurie Blavin

As with feedback, comparing the amount of control in real-world experiences gives us a good starting point for designing other kinds of experiences. People expect to have some degree of control over their experiences. This control usually makes them feel more comfortable and respected. It might be controlling the rate of interaction, the sequence of steps, the type of action or features, or even how much feedback they desire. The only way to know how much control is important is to question participants about their needs and desires, and then test the experiences to see how well they work.

Experiences that seem to adapt to our interests and behaviors (whether real or merely simulated) always feel more sophisticated and personal. Though these experiences, necessarily, take more energy and planning and are significantly more difficult to accomplish, they are more valuable to the participants.

Customization is one form of adaptivity that allows people to overtly choose options to tailor an experience to their needs and desires. Customization is easier to develop than personalization since the options are always finite and controllable.

Personalization requires a more sophisticated level of interaction and planning, as choices and options cannot always be anticipated. Personalization allows people to create more unique experiences that are adapted even more to their needs and desires.

It is possible for experiences to adapt to participants in a variety of ways. The experience can change based on the behavior of the user, reader, participant, actor, or to a user's interests, needs, goals or desires (stated or inferred from behavior), experience or skill level, or even to the time or day or year, or even location (or experience or participant). It's important for designers to understand which attributes will make an experience more successful and valuable to users (which attributes are most appropriate), and balance these with those that are possible to create with the system, resources, budget, or schedule.

For example, many games become more difficult as the player becomes more proficient, constantly challenging the player in new ways. In other systems, content might change to be more detailed or simple based on the point of view, level of proficiency required, or amount of detail inferred from the user's behavior or location (such as a university versus a grade school).

The best experts and most proficient communicators are always adapting their interactions on-the-fly to suit the reactions they perceive in their audiences from body language, statements, answers to questions, and so forth. Because we are accustomed to this kind of behavior from people, it is natural to expect systems to respond in kind.

Participation is the key to many successful experiences—certainly those that are intentionally designed in such a way that they couldn't exist without the participation of their audience. Participation makes experience more meaningful because it taps into our desires to be creative and communicate. Whether we are merely sharing our ideas and opinions or creating and displaying our works of art, it is gratifying to almost everyone to express themselves creatively and work with others to build an experience.

Many experiences couldn't survive—or even exist—without the involvement of their audiences. Most experiences could also be made better by redesigning them to include opportunities for participation on the part of the audience.

Some of the most compelling and involving experiences are organized around the telling of stories—whether these are from the experience creators or the audience.

Storytelling is one of the oldest experiences and still one of the most powerful

because it organizes information in a way that allows us, usually, to draw *personal meaning* and create *knowledge* (see page 48).

There are as many different ways to tell a story as there are storytellers. The two most important characteristics of successful stories are that they are **authentic** (this doesn't mean that they cannot be fictional), and that they are **relevant** to the audience. Additionally, many stories are successful when they can evolve to fit the circumstance and take into account the reaction of the audience. This doesn't mean that the story must be told or created cooperatively (in fact, this form of storytelling can be fun or silly, but isn't usually fulfilling).

Storytelling must take into account **perspective**—whether the story is told from the first person (as something that happened to the storyteller personally), the second person (a difficult perspective to use for most stories), or the third person (a very common perspective).

Most stories require at least a **beginning** (to understand the context), a **middle** (the story itself), and some form of **end** (to draw the story to a satisfactory close and, often, to point out the meaning, moral, or lesson if there is one). Settings, characters, styles, dramatic purpose, and themes are all important, but without the basis of purpose and flow, no story can be told well.

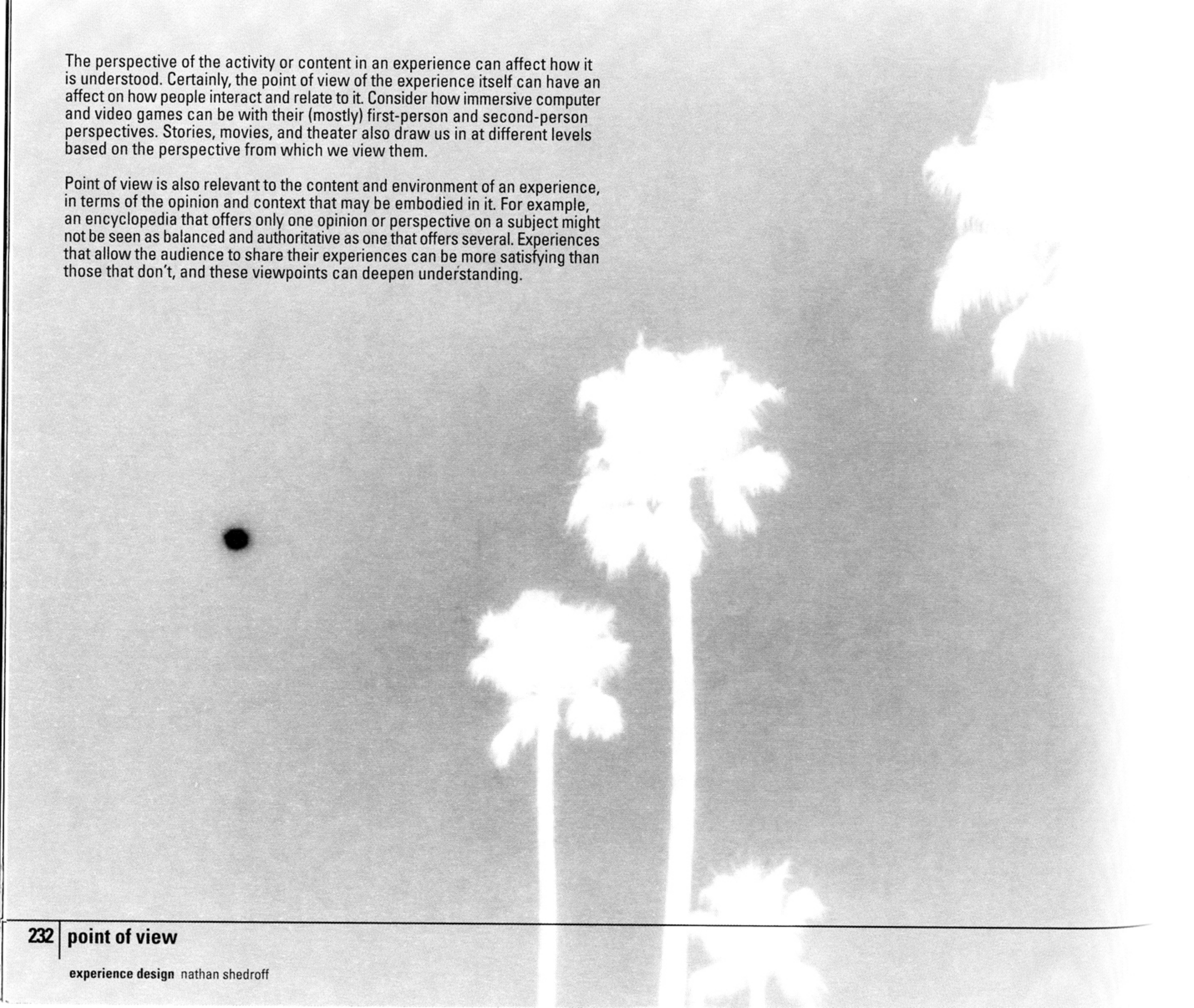
Innovative experiments in storytelling have tried to incorporate multiple points of view in the telling, offer non-linear or branching stories, or provide improvisational story building. Some of these have been successful, but it takes a particularly skilled storyteller to do these well. More often than not, simple, linear story structures allow storytellers to concentrate on the meaning and emotional content as well as the careful development of action and characters in order to arrive at a satisfying conclusion. Storytelling is so difficult for most people that the less variables they need to control, the more successful the stories they create.

Stories can be used not just as entertainment but as a way to make difficult concepts, information, or instructions more accessible

Again, because we are so familiar with stories, the structure allows us to concentrate and order the information more easily than many other forms. As long as the story doesn't get in the way of the purpose or use of the information, there's no reason why stories can't be used to make instructions, directions, reports, or guidelines of any kind easier to understand and remember. Politicians have been using stories to illustrate their positions for a long time.

The perspective of the activity or content in an experience can affect how it is understood. Certainly, the point of view of the experience itself can have an affect on how people interact and relate to it. Consider how immersive computer and video games can be with their (mostly) first-person and second-person perspectives. Stories, movies, and theater also draw us in at different levels based on the perspective from which we view them.

Point of view is also relevant to the content and environment of an experience, in terms of the opinion and context that may be embodied in it. For example, an encyclopedia that offers only one opinion or perspective on a subject might not be seen as balanced and authoritative as one that offers several. Experiences that allow the audience to share their experiences can be more satisfying than those that don't, and these viewpoints can deepen understanding.



Time and motion are the underpinnings of animation and video. Though we're familiar with time and movement, we are usually unfamiliar with the design details used to craft an experience using animation and video. As with all other computer-enabled disciplines, novices quickly begin to appreciate that creating a satisfying design requires a wealth of time, experience, and knowledge—more than just access to a low-cost, powerful system for developing animation or editing video.

As with immersion, creating satisfying animation or video has as much to do with the cognitive or narrative solution as it does with the actual imagery. Experienced animators, for example, understand that the illusion of motion must be carefully created not just from slight changes from scene to scene but with characters and objects specifically drawn to imply motion and action. Likewise, cinematographers know that planned editing from scene to scene and view to view is almost as critical as the action caught by the camera.

What differentiates successful video and animation is the care and appropriateness in illustrating motion and using the edits as a player in the story, which is just as important as lighting, acting, and costumes.

Another factor of time is in pacing; and this, like motion, is an element as critical as the subject matter itself. Alfred Hitchcock, for example, used timing and pacing in a film to create suspense in ways previously not conceived. Music videos use time and motion to create moods and influence emotions.

There is a visual literacy to timing, editing, and motion that we learn through experience. By the time we're young adults, we often take for granted the visual cues employed to tell a story—often used to tell it more efficiently. Just as we take for granted the act of talking to another person through a plastic, impersonal device like the telephone (something that babies must learn); so, too, do we take for granted the visual devices we've become accustomed to in the telling of stories on screen, such as close-ups, jump-cuts, establishing shots, and speed lines.