This issue of *Design Quarterly* is not about hats.

Richard Saul Wurman
Editor’s Notes

For over twenty years Richard Saul Wurman has maintained that information about the places we live and the roads we travel is neither readily accessible nor easily understood. And he has devoted himself to an effort to correct that situation by making understanding his business.

It is fair to ask whether the “understanding problem” discerned by Wurman actually exists. A considered reply would have to be an unequivocal yes. For how many of us can easily assemble components of the stereo, TV, VCR, and CD equipment we have acquired with such innocent expectations? Or who among us can actually put together a “knock-down” lawn chair purchased from a mail-order catalogue? Can most people you know read a city map, or follow a subway guide with ease? If you are the exception to the rule, read no further. But if, like most of us, the ability to cope with such daily challenges alludes you, the light at the end of the proverbial tunnel may be found on the pages that follow. In them, Wurman analyzes the basic ways that we organize information in order to communicate clearly and easily with one another—in other words, how we hang the hats on the information racks. We hope that designers, editors, and manufacturers are listening.

Wurman’s first essay for Design Quarterly, “Making the City Observable” (1971), was a collection of the best means then available to acquire information about our surroundings. Exemplary maps, guides, atlases and comparative charts from around the world were listed and described. Since that time, through Access Press and The Understanding Business, Wurman has created his own series of extraordinary maps and guides to major world cities, and to medicine, baseball, the Olympics, and even The Wall Street Journal. This issue of DQ is a summary of the ideas that go into the creation of these information systems.
This issue of Design Quarterly is not about hats. It’s about hats as a metaphor for units of information.

It’s also about the hat rack as a model for the understanding of relationships and the finding of information.

This issue of Design Quarterly is about the visual hat racks (maps, diagrams, charts, lists, time lines) that help us understand how our world is organized. Information hats may be hung on these racks so that patterns, connections, and relationships formed from such adjacencies are revealed.

Most people start to organize information by making lists. We make “to do” lists—lists for shopping and phone calls. We’re comfortable with lists because we read lists in the form of book indexes, store directories, and restaurant menus every day. They become the “hat racks” upon which we organize our activities.
While it may seem that the methods are infinite, there are really only five general ways to organize information—what I call the Five Ultimate Hat Racks:

- Alphabet
- Time
- Location
- Continuum or Magnitude
- Category

Rearranging hats on a hat rack can reveal meaning, depending on how the hats are organized. The best way to organize information is the way that most easily reveals the aspects of a subject that you want to communicate.

If a hat-check clerk arranges hats according to the time of each guest’s arrival, he will have a chronological record—a time line of hats (12:20PM, 12:25PM...).
The same hats may be grouped by category (feathers, ribbons, protectiveness, religious, military, style...); according to their location of manufacture (Holland, Africa, Japan...); alphabetically (bowler, cap, fedora...); or by continuum, such as size or cost.

When a hat is alone, it may tell us little about itself or the wearer, but in comparison with other hats it may indicate authority, membership, occupation, or interest.

**The creative organization of information creates new information.**

The hats never change, but hanging them in different patterns or with different rules or on different hat racks can affect what we learn about them.

More complex relationships may be shown when one type of organization or hat rack is combined or juxtaposed with another. Units of information may be organized by category, then arranged by location under each category.

The same information may be organized in a number of different ways and when the results are analyzed new patterns emerge.

*Every breed recognized by the American Kennel Club, from the smallest to the largest of man's best friends, appears in the two diagrams shown here.*
If you organize hats into a category of performance and then into one of materials, you might see that hats made from harder and stronger materials tend to be used as protection. You not only learn the fact but you understand the basis of it. You begin to recognize all sorts of new relationships.

**The essence of leaps of understanding relates to connections.**

The joining and connecting of two things is a joy, an art, and the beginning of a map of learning.

A wonderful chair is wonderful in part because it’s put together well, because the connections are good. A good building has wonderful connections, and it’s the architecture of these connections, their design, that is compelling. I believe that encouraging awareness of connections leads to recognition of the patterns that are the core of understanding.

**Understanding is a path, not a point. It’s a path of connections between thought and thought; patterns over patterns. It is relationships.**

Pages from The Wall Street Journal Guide to Money and Markets show how parts of the Journal are pulled out and explained. The explanations are connected to the page with a series of lines. This forms a kind of map of the pages and helps the reader understand how the pieces of information relate to one another. At once, the reader learns about the individual aspects of money and investments, learns how to find them in the Journal, is encouraged and supported to open up the periodical, and sees how these pieces are interconnected.
It is not the things themselves but the meanings or patterns that we associate with them that determine our understanding.

Understanding is the first part of communication.

**You can only understand something relative to something you already understand.**

A measure of successful design is communication of meaning and comprehension. But this doesn’t mean that successful design must be sterile or uncomplicated. It can be wonderfully sophisticated and rich—even dense, textured, and beautiful—as long as it is understandable.

Making things understandable should not be confused with simplification. Most people think that the way to make something clearer is to simplify it, and vice versa. But this isn’t true. Many times information becomes vague and meaningless when there is nothing to relate it to—it is the idea of simplification that has led to the “dumbing” of America.

**Understanding is not about simplification and minimalization, it’s about organization and clarification.**

We learn when clear patterns are presented that provide an opportunity to make connections. Things of extraordinary density can be understandable if they are well organized and not merely simplified or beautified.
Style can be a passenger on the train of design, but not the engine.

The power to run that engine comes from the ability to perform and not the desire to please.

In a parallel way, architecture is the thoughtful making of space.

It is the hierarchical organization of performance in three dimensions instead of two. Spatial organization is based on what is served and what serves. Specifically: a closet serves a room; rooms serve other rooms; a hallway serves several rooms. The hat rack here is location based on the relationships rooms have to each other.

Our bodies work the same way: organs serve particular purposes and they serve other organs. We have skin and skeletons and so do our buildings.

The airport is an example of how structure and meaning might work together. In an airport, the space itself should indicate paths and alternative paths through a series of functions that eventually get you on to a plane. Designed effectively, this is the architecture of information.

A diagram from MedicalACCESS clarifies the human body by using bold, simple shapes and showing only major organs and systems. Although the detail is greatly reduced, the understanding of what is shown is significantly increased.
A parallel may be found in graphic design. Designing a guidebook that takes you through an airport or a city should be the same as designing an airport, or a city. Each should be inherently understandable through its structure.

Complexity of information varies, but the parallel still holds. Architecture should be created like graphic design, graphic design like teaching, teaching like managing, managing like conversation, conversation like architecture.

When you approach a problem, you must go backward to find the beginning before going forward to find the solution. Seldom, if ever, is the problem correctly stated. The classic, pervasive seduction to designers has been to find a solution instead of the truth. You must be a few steps behind where others usually start when solving a problem if you want to discover the forces behind the problem. Only then can you ask yourself the questions that will lead to productive solutions.
Where does “money” come from?

The term money goes back to the French monnaie (coin), and even farther, to the Latin moneta, which also gave us mint.

Salary is really salt money, harking back to the days when Romans paid soldiers in salt—a precious commodity needed to preserve perishable food. A fee however, originated in...
Sometimes it’s necessary to figure out a way to make something uninteresting interesting.

It’s important not to feel guilty about things that aren’t personally interesting. People feel pressure to be informed and enthusiastic about things and memorize things that are of no interest to them.

You have to make connections, to bring subjects into the realm of your interests. While hat manufacturing may be uninteresting to you, there may be something about hats that does interest you (like the materials hats are made from, how they are bought and sold, or where they come from). If you cannot find interest in what you are designing, it is doubtful that you can make it interesting and understand-able to anyone else no matter how hard you try, no matter how beautiful it is.

**Innocence allows your mind the freedom it needs to make and form patterns.**

Training for innocence is part of understanding and organizing. This is anti-theretical to much that we’ve been taught. We’re taught to be knowing people, yet a key to success is to be unknowing. How does one train for this? Imagine going to a meeting and saying, “Look, I don’t understand anything. I have no expertise at all. I can find out a lot through my inabilities.”

The movie *Rain Man* illustrates the meaninglessness of extraordinary but indiscriminate memory.

It is additionally interesting to note that when this movie is shown on an air-plane, the critical scene of the central character’s fear of flying is edited out although it is essential to the viewer’s understanding of why the brothers journey west by car.

If innocence is a word that seems pecu-liar or corny here, let me explain. To me, innocence is the lack of preconceptions that prevents you from finding connecting trees and seeing patterns.

There are many different ways to de-scribe how different aspects of our minds function. Maps of the Mind, by Charles Hampden-Turner, is a book that attempts to explain some of them, both graphi-cally and in the text (Illustration by Dave Fernandez).
Learning comes from admitting ignorance. Your expertise should develop from your
inabilities. A passion for understanding comes from wanting to understand what
you don’t. It is innocence, lack of understanding, and the joyous refrain “I don’t
know” that allows us to discover patterns and utilize the best hat rack.

Innocence is like an empty bucket, and the job is to fill it up.

We all accumulate a lot of information, and we all want to be informed, yet these
things don’t necessarily interrupt our innocence, our ability to recognize pat-
tterns. What’s being accumulated is a deeper understanding of patterns and
connections.
There are essentially two kinds of people: *how* people and *what* people. There are those who think about how they are going to accomplish something, and there are those who stop to think about what it is they want to accomplish in the first place.

*What* and *how* are important in doing almost anything. I try to think about *what* is to be done rather than *how* to do it. It's important to consciously state: "No, that's *a how*, not a *what*; think of *what* it is and not *how* you're going to do it."

With so many media through which to express ourselves, it's seductive to think in terms of how a thing is to be done rather than what it essentially is. It's useful to describe an idea and say: "Am I describing what I want to do? Or am I prematurely describing how I want to do it?" The test is to ask "What is the goal, independent of how a thing works?" Then things can be evaluated based on what the goal is. The best hat racks are designed out of realizing the *what* before the *how*.

**The Age of Also**

The paper-less office predicted with the creation of the computer has instead turned into the use of more paper with the explosion of desktop publishing. Other predictions that have misfired include the death of movies due to television and the VCR. Instead, what has transpired are more movies and more television. The *Age of Also* has created more and better magazines well after the death of the magazine was predicted due to the creation of the television magazine. These predictions, and more like them, are made by those who are so seduced by the technology that they fail to realize that these systems encompass much more than just technology. In fact, many times the technology of choice often creates more use of competing technologies. As an example, it is common to phone before sending a FAX, phone afterward to make sure it was received, and express mail the original as well. I think it's safe to say that the electronic version of the yellow pages will be a product that we will use along with the print version. Even some extraordinary versions of our daily newspapers will survive the electronic revolution.
I've tried to make this process automatic. I've tried to think so much about the difference between what and how that I don't have to think about it anymore. And still, from time to time, I find I have to think about it and say "no, that's a how, not a what; think of what it is, not how you're going to do it."

Schools of design, journalism, and communication should develop a focus on finding personal paths through learning and on the training of what people. Schools in general should deal with interests and interest-connections rather than requirements.

I believe that if schools focused on interests rather than memorization and requirements, people would be able to ask the questions of what and how more easily. The reality of education is intellectual jail when it should be intellectual hedonism.

Schools should be a smorgasbord of availabilities with people around to counsel students on what goes well together, the order in which to ingest things, the gastronomical consequences, and the nourishments that can be obtained. Everybody's meal construct might vary, as well as the speed with which they eat—whether they eat alone or with many others, how many times they chew their food, their utensils, their eating habits. The compartmentalized ladder on which you put these things is another form of hat rack.

Q: We have access to a vast quantity of information. How does that affect how we choose? In some ways it becomes more difficult to make any choice. Do we need to be more discriminating?

RSW: I don't think that discriminating is the right word. We must learn to trust our interests to guide us through what we want to know. We have to make these decisions for ourselves. It is important to generate a personal system of interests, of connections from interest to interest. Once we take care of our needs, the quality of our lives is based on our interests and how we follow them.

Q: Following your own interests seems opposed to the recent desire for "cultural literacy."

RSW: Cultural literacy is merely another form of trivial pursuit, and it's dangerous if we model our education system on the completion of some sort of cultural inventory. We will all be prepared for God's Ultimate Cocktail Party but not for life. Cultural literacy has to do with facts that are like leaves on a tree. All of these different facts are connected through branches down to the trunk which is the access to all knowledge. It is the learning about how to learn, how to make connections, and how to find and organize things that form the roots of the tree and support it.

Q: But how can a writer or designer create things that are more understandable?

RSW: It may sound mystical, but by becoming more innocent and ignorant about what it is you are doing. Think about how people who don't know all the things you know about a project are going to use what you are creating. Realize what they do and do not understand. Your projects should be a conversation with the user. You must be able to say "I don't know" yourself and confront your own insecurities about information and interests.

Q: But without an interactive, multimedia presentation, how can a graphic piece or a publication be a conversation?

RSW: Conversation is the best model of how we communicate. The implied concept is that neither party will exit the conversation without both understanding what has been said. There are all kinds of cues that we employ—body language, tone, inflection, eye contact... that help communicate, and conversation is self-adjusting and active, not passive. Published pieces can attempt to do all of these things.
One old adage is that form follows function. But function is a basic requirement and it is artless. It is a word that has to do with adequacy. It is a very basic term and that is why I take exception to it, unless you elevate it to an art form. Then it becomes the art of information, not the function of information. At best, it is both an art and an entertainment that performs well.

I believe that information made understandable, information that performs, becomes absolutely and magnificently beautiful; particularly when you don’t try to make it beautiful. I have a great belief in the beauty of graphics that perform wonderfully—not function wonderfully—but perform wonderfully.

**The art of function is performance.**

*This diagram for the Fluor Corporation 1976 Annual Report by the James Cross Design Office is an exceptional example of the way to make information understandable. It not only explains the qualities of the different groups of money in the text, but visually shows the relationships between them in size and flow.*
Everything is a map of something.

Everything can be looked at as if it were a map.

When I look at a person sometimes I mentally slice that person in half and make myself an imaginary cutaway body map. A bar graph is a map that describes how well or poorly a business is doing.

**A map is a pattern made understandable.**

A pattern performs best when it represents a single idea and not the complex layering of a multitude of patterns.

I believe there are maps that don’t occur on paper. There is a map in your mind, a mental map. There is the map memory that speaks about remembered relationships.
Maps are usually based on the hat rack of location. They are concerned with proximities and relationships.

The maps in the PARISACCESS book are segments from Blondel's remarkable map: *Plan de Paris à Vol d'Oiseau*, first published in 1739.

The seven area maps represent the modeling of a map based on the idea of conversation: conversation through the printed word juxtaposed with a line that represents my finger pointing out something.

Conversation is a wonderful device, and it has been my quest, with a picture and with a map, to enable the formerly passive viewer to become an active participant—to have a conversation with the printed page.

A map can allow you to find a personal path through information and to give you ownership of that path. Ownership means that you are comfortable enough with the information to feel that you possess it.
The organization of information on a map and the patterns that are clarified by that organization are just as meaningful as the individual bits of information that you put down.

How many patterns can you put on a map? If you have piece of information A and piece of information B, you also get AB. If you have A, B, and C you get not only A, B, and AB, but also AC, BC, ABC, ACB, CBA, and so on. You can see, however, that as you add information, the number of relationships grows very rapidly. It is easy to build too many relationships, and then the map quickly becomes confusing.

These rail maps differ in the way they represent stops. The Yamanote line map from TokyoACCESS is more abstract than the London map. Because the distance between stops is not controllable by the rider, it follows the route generally, not exactly. It forfeits specific detail and gains memorability and clarity. The London Underground map is less abstract and uses the convention of limited line angles to retain clarity. Here also, distance is not true—it’s a map of connections.
The same principles may be applied to most graphic information, especially dia-
grams. In fact, every diagram is really a map of something. And just like a map, a
good diagram gives insights to structure, meaning, and function. Again, the goal is
to let the data become information—to become active and expressive—and not
to smother it with useless decoration.

There are many different kinds of dia-
grams, too many to show here, but some of
the most interesting are flow charts that
illustrate decision-making processes, exploded
views that show relationships of parts to a
whole, elevations that show buildings and
products in a consistent and relative way,
cross sections that show specific slices
through something that is put together.

The copier path illustration here
functions as a map of the route a
piece of paper takes through the
copying process.

Here are two different maps of the same
molecule. One is more realistic in its de-
piction of the molecule in three dimen-
sions. The other is more abstract and
carries additional information. They are
both valuable in different ways (illus-
tration from the Avery International Annual
Report, 1983).
Scale and color are important components of diagrams, charts, and maps — even page layouts. In many diagrams the most prominent information is the most useless, and the important information or structure is buried.

Relative size is especially important in making comparisons. If you have maps of countries at different scales, you get a false relationship and understanding of them.

It can also be beneficial to take information that is in values difficult for us to comprehend (millions of miles, light-years, billions of dollars, millionths of an inch ...) and put it in “common” terms.

Color can be misleading because it has different meanings for different people. It can have symbolic meanings that may or may not be commonly agreed upon (red meaning danger or important, green meaning OK, and so on).

Most people do not understand color theory, and thus, chroma shifts (red to orange to yellow) cannot be relied upon to convey information such as change in magnitude. At best, color can be used to differentiate parts and should be readily understood if it is used at all.
Color added to information purely to “spice it up” usually has the opposite effect. This is called “rainbow worship,” and it often makes things confusing and distracting.

The ease with which we can do things is directly related to the ease with which we can abuse things. Color is a good example of this. Our ability to make information more colorful (from magic markers to computer screens) leads to color being used simply to beautify. Color can be an extremely valuable tool to express different categories. But using color to show differences in any of the other four hat racks often results in misinformation.

Color and scale are both examples of how presentation affects communication. You can’t begin to design the presentation (the how) until you have structured the information well (the what). But if you aren’t attentive to the nature of the presentation you can unravel the effectiveness of the communication.
In architecture, the elegance of form, model making, and illustrating have often preceded the presentation of ideas and their meaning—and so we have buildings that look like models. We have buildings that look like paintings, buildings that look like lithographs, buildings that look like puzzles, buildings that look like centerpieces, buildings that look like sculpture, and buildings that look like misunderstood historical revivals.

We have architecture that looks like the presentation—the art of the presentation—rather than the meaning or the intent or the performance of the buildings themselves. This mistaken emphasis has favored the ability to create impressive presentations over the ability to create meaning, and it holds true for all design.
Each style and technique of presentation has its own integrity and peculiarities, and these must be understood when developing a particular presentation. For example, the discovery of perspective (I like to think everything is discovered and nothing is invented) in the quattrocento in Italy allowed people to describe buildings and spaces between buildings and spaces in buildings in a way that hadn't been possible earlier; this discovery affected the subsequent design of space, place, and building.

Each time a means of presenting information has evolved, whether ball-point pens or computer screens, the means has affected the actual design. I do not mean that technical innovations make a design better, but that the means used to describe a design have an affect on the design itself.

Louis Kahn's architecture and the evolution of his geometries were influenced by his use of charcoal. He rubbed his sketches out with his palm and drew them again and rubbed them out again. Often there were twelve layers to the development of an idea rather than a single precise drawing.
The purpose of displaying information in a chart is to make related data understandable. The goal is to induce the reader to think about the *substance*, not the *style*, of the chart. Therefore an appropriate type of chart must be used. If you haven’t figured out which hat rack to use or how the information is to be structured, graphics won’t help you.

Remember that there are only three ways to show a change in magnitude visually: increase by the number of units (more compared to less), increase by size (some larger than others), and increase by value (darker or lighter than others). These principles can relate to all kinds of information graphics (maps, diagrams) and not just to charts.

Successful charts, like all successful information graphics, reveal more than just the data contained within them. They ultimately reveal the relationships and meanings within the data, and thus, the data become information.

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<th>Men</th>
<th>Women</th>
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<tbody>
<tr>
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<td>9.95</td>
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<td>Annegret</td>
<td>Vera Komisova,</td>
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<td>Richter,</td>
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<td>FRG, 1976</td>
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<td>1978</td>
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<tr>
<td>1983</td>
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<td>10,000 Meters</td>
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<tr>
<td>27:38.35</td>
<td>28:05.45</td>
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<tr>
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<td>World Record</td>
<td>1976</td>
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There are four basic types of charts:

* Bar
* Pie
* Fever
* Table

The bar chart can be used for most kinds of information. It compares varying quantities of the same data. The key to a good bar chart is the use of consistent and constant scales. The area of ink in the bar is seen by the eye as a quantity, so if a shape other than a bar is used, it must not imply a distortion of the data. If that shape implies a volume, then the matter is complicated further, because the volume implied by each piece may distort the data even more. The grid should be minimized as much as possible so that it doesn't compete with the information.
Pie charts are overused. They should only be used to show percentages of a quantity and only when there are not a lot of comparisons to be made. The inherent problem is that it is difficult for the eye to relate the size of the slice to the area of the entire circle. This means that when there are too many slices or when the slices are too thin the reader can never get a sense of comparable quantities.

Fever charts usually show the change in a quantity over time. In fact, they perform this function beautifully because the movement of the line up and down is very apparent. Stay away from exponential scales (measurements that increase exponentially rather than arithmetically) because they distort the information. To be effective, a scale should start at zero.
Tables are generally used for precise values. It isn’t necessarily the values that are important in other types of charts, but the relationship between them. Here, it is the values themselves that are important. But don’t feel that accuracy is necessarily informative. In some cases, rounding off numbers is much more effective than numbers to the fourth decimal place. It depends on the nature of the data and how it is to be interpreted. If the values are in dollars and cents, they should line up in columns by the decimal point.

In this type of chart, it is usually unnecessary to have many rules (especially vertical ones). They add density to the chart and the columns, and if properly tabbed and spaced, should provide all the structure necessary to make the chart cohesive.
Time lines are an appropriate way to show historical or sequential information and events. One of the five ways to organize information, they are perhaps the purest hat rack of all. They can give the reader a great sense of the flow of events and the linkages between them. They also provide a great opportunity to merge text, image, and design to make events understandable.

There are some inherent problems with time lines, however. One is that history is reduced to basic, separate units instead of continuous flowing actions. It is very easy to lose the sense of one action affecting another and of how rich and textural history really is. It can also be difficult to convey the patterns that occur within history. Also, time lines tend to make the when more important than the what or the how.

There are three types of time lines:

Diagram

Text

Tree

A diagrammatic time line attempts to create a visual image of history by including illustrative examples related to the written entries. This type of collage approach can help build a coherent understanding of the sequence of events.

These time lines from Polaroid-ACCESS are text-based. Color and location differentiate types of information running throughout the book. The blocks set near the bottom of the book are on beige backgrounds and contain corporate news and general headlines of the time. The type on white backgrounds explains the products, history, and advertising of the corporation, and the type on black backgrounds discusses the ongoing research and technical development by Polaroid.

Research is underway for an electric-eye accessory which will provide correct exposure in any outdoor light.

Corporate Culture: POLAROID initiates a Tuition Assistance Plan for employees, refunding full tuition to employees who complete approved courses.

Personnel: L.M. Booth begins working in Polaroid's Film and Engineering Division. Dr. Elkan R. Blout is elected Vice President and General Manager of Research and is appointed a member of the Operating Policy Committee.

Dr. Land is appointed Fellow, Royal Photographic Society of
A textual time line merely lists the events in sequence. These entries can be more or less detailed and may even be split into adjacent categories that run next to each other. This is, perhaps, the most disjointed type since the entries have dates and are in order, but there is no visible time line with constant increments that provides structure. It does, however, provide an efficient way to list vast quantities of information in very little space.

The tree time line attempts to provide the linkages that are normally lost in time lines. These help the reader understand the connections between events. This is a good way to convey the richness of history as well as the events themselves, but since history is rarely neat and organized, a tree time line can quickly become overly busy.

If you are comparing two or more sequences of events, the increments of the time lines must match to be effective.

Men of Modern Mathematics, a history chart of mathematicians from 1000 to 1900, was produced in 1966 for IBM by the office of Charles Eames. It is an example of a diagrammatic time line. The connections between events are not presented, but events overlay a set of running time lines at the bottom. This implies connections, and conveys a richness when all this information is referenced together.
Trees are a special type of diagram that allow the connections between pieces of information to become the structure of the diagram itself. It can also be the basis for the structure of an entire book or database. The connections then define the path between different pieces of information.

Trees can be systems of connections of any interacting elements (interests, relationships, systems ...) and are a way to describe interconnected subjects. In a way, they are another type of hat rack—one that is a combination of the other five. They are maps or paths that guide us through relationships.

There are two different types of tree diagrams: plain trees, those whose elements are divided into sets that are only connected to other elements through larger sets; and semi-lattices, whose elements can be cross-connected to others, regardless of the larger sets they are a part of.

Although the semi-lattice seems less organized, it is only less compartmentalized. It is no more chaotic and no less organized than a plain tree, but it is usually more complex and richer; and appropriately, it is more challenging to display all the connections.

A semi-lattice is more like a “natural” system, where connections are established based on needs and interests outside of a structure, whereas plain trees are typical of “man-made” organizations where connections are usually made within the rules of a structure of some sort.
Lists

We encounter lists so often that we seldom realize how efficient a road map they are to information.

Tables of contents form the primary outlines that guide us through a mass of information, however complex and dense. To understand the outline is to understand the structure of the connections of the information.

Indexes help guide us through different aspects of the same bulk of information. They organize the information into direct and quick paths along specific requirements (alphabetical, numerical, by location, by time, special categories). They have nothing to do with the primary organization but are different ways to access it.

Glossaries, bibliographies, etc…., are further attempts to slice information in different ways in order to reveal new aspects, or new access.

Once you decide on the primary organizational system to be employed, the information falls into place. The more care you give the former, the more easily done the latter.
Instructions

Instructions are among the most basic things we communicate. We give and receive them all day, every day, but we seldom think about how to ensure that they are understandable.

There are different types of instructions: emotional ones, operating procedures, geographic directions, and mission statements.

They can take the form of posters, charts, diagrams, quick-reference cards, manuals, handbooks, even conversation. The common elements of instructions, however, remain the same.

The level of understanding of the person with whom you are communicating is not necessarily the same as your own. It is easy to forget that terms you understand, especially the jargon of your profession, may be new and unfamiliar to others.

You may suffer the disease of familiarity, meaning you are too familiar with a subject to know how others will view it. Things that seem redundant or irrelevant to you may not be at all obvious to newcomers.

Checkpoints along the way are crucial to good instructions. You need to include a sense of what the follower can expect at any given point. This will not only let a person know when he or she has gone too far, taken a wrong turn, or made a wrong decision; it will offer reassurance.
Should you want to put together a bicycle, for example, instructions should let you anticipate how the pieces go together. It should also describe the mistakes you might make.

Failure is implicit in giving directions. They should describe which course to take if the instructions don't work, or if they lead you too far. Good instructions have a cyclical potential of success and failure.

Instructions are fundamental to architecture because the architect doesn't build the building; the architect gives instruction on how it should be built. The idea of giving instructions is a wonderful metaphor implicit in the mapping of all things. Instructions should contain explicitly and implicitly both anticipation and failure.

Instructions in the workplace should allow people to perform better and inspire a sense of personal creativity.

Designers should give the user instructions in how to understand information and how to cut a path through it.

Instructions can be more than merely a list of commands. They can be informative, reassuring, helpful, and clear. They can be a conversation.

It is the job of the designer to treat the structure of instructions with more attention than the display of instructions. When the instructions perform well, understanding follows.

Most airline safety diagrams give only the minimum of information and impart little sense of security to the reader. They are usually poorly drawn and not very adaptable. It is probably asking too much of these diagrams to function well in an emergency when people are overcome with panic. It is a much better solution to have instructions built directly into the plane's structure and environment, such as bright arrows that light up on the floor to show the best escape route.
This issue of *Design Quarterly* is about a singular passion: making things of personal interest understandable to others.

Interest is the key word to one's passion and the key to learning. It's the word that holds memory and learning in a constant embrace. Memory, interest, and learning define our existence.

Learning is remembering what you are interested in.

The core of a word has deeper, more essential meaning than the entire word. As the core of an idea (the *what* as opposed to the *how*) has a deep, essential meaning.

The word *inform* is richer than the word *information*.

*Realize* is more intriguing than the word *realization*.

The word *wonder* is more compelling than the word *wonderful*.

These words represent the beginnings, the formation of things, the blueprint of that which is about to happen.

This issue of *Design Quarterly* is about understanding the organization that leads to learning.

RSW

Richard Wurman has devoted much of his career to making various kinds of visual information understandable through his inventive design of maps and guides. In 1959 he received his M.A. from the University of Pennsylvania, Philadelphia, where he studied with and worked for the architect Louis Kahn. From 1963 to 1976 he was a partner in the Philadelphia architecture and urban-planning firm of Murphy Levy Wurman. At the same time, Wurman became well known for his writing, teaching, and exhibition development. In 1981 he founded Access Press, which has produced guidebooks for Los Angeles, New York City, Washington, D.C., San Francisco, and Paris, among other cities, as well as a 1990 United States road atlas. In addition, Wurman's San Francisco office (The Understanding Business) has designed PacificBell's *Smart Yellow Pages* (1988).
Design Quarterly

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In Design Quarterly 144, Images in Motion: R. Greenberg Associates, A Design Anatomy, we inadvertently failed to acknowledge that Superman is a trademark of DC Comics Inc. We regret the oversight.
The pictures of friends, taken at an AGI hat party in May 1989, are courtesy Paul Prejza. Those of Robert Blaich, wearing hats from his remarkable collection, were taken for this issue of DQ.

front cover: Max Ernst
The Hat Makes the Man, 1920
Collection The Museum of Modern Art, New York