

Hypertext

Designing hypertext is an intellectual task

Paul Kahn

Paul [Kahn](#) has been working since thirty years as a designer of hypertext applications, interfaces and websites. Gerlinde [Schuller](#) talked with him about the past and the future of hypertext and the [World Wide Web](#).

The term hypertext is often misunderstood. What is your definition?

My understanding of it is based on how Ted [Nelson](#) defined it. I think of it as his concept. His original concept was the ability to use computers to create arbitrary navigational connections between pieces of information and memories. Hypertext is the ability to create these discrete elements of information and make arbitrary connections between them that can be followed. Hypertext is non-sequential reading. Non-sequential writing also, but the effect is manifest in non-sequential reading. You can write in any sequence but you can read it in another sequence. It could be prepared in any number of structures but you can reorganize it as a reader to follow from one place to another. Obviously this has some analogy to how people think. It provides some flexibility that other systems don't.

Did Vannevar [Bush](#) foresee hypertext in his concept of a [Memex](#)?

Bush's system was the idea to use a machine to extend your [memory](#). He wanted to create machines that would help people manage what they had read, to be faster and more permanent than human memory by recording links. So even if you couldn't remember things at the moment, the machine could do it for you.

Bush was an engineer and concerned that high intellectual workers would have support so that they could do their intellectual work and pass it on to their colleagues. He was imagining and trying to build machines that could help people to do their work. He was not so concerned about [universal knowledge](#), in the

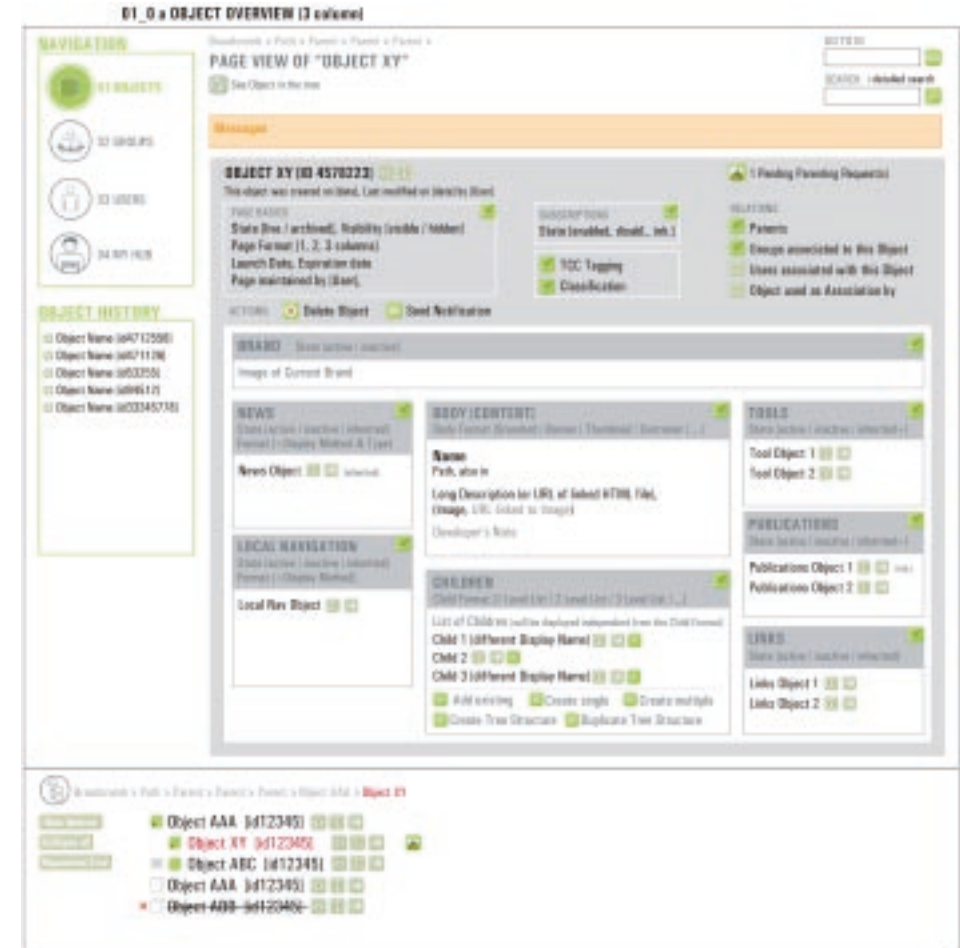
sense that everyone should be able to understand everything. He did not have a populist's imagination as Nelson had in the 1960s. Nelson was imagining that you could take the power that is inherent in computers – as computers were holding information in digital form – and you could make a link from any piece of digital information to another piece of digital information, and all these pieces of computer memory would be one big network. All of the world's literature would be available in this open network, and the way in which you would be able to make the connections between all this digital material would be through hypertext.

Do you see an unused potential in the area of hypertext in today's World Wide Web?

One of the things which bothers me today is that, while the amount of information that is now available freely on the Internet has grown enormously, the types of information are represented very differently. It's very common today that if people are looking for information they will not find any information that exists in books. It's easier to find information that exists in videos. So most of the work which has been done in [digitization](#) by libraries has not been immediately effective. Scientific article information is tremendously available and it has an impact, as does [Wikipedia](#), which has a very large impact, because it is ranked quite often at the beginning of [Google](#) search results. I hope that in the future every book will be available and searchable on the Internet and that it will be as easy as to go to a large [library](#) and pick a book out of the shelf, only following your curiosity.

Do you believe in universal knowledge access?

I don't believe in universal knowledge, but on the Internet there is a tremendous amount of information out there. Having the experience of that kind of power is great; in my own [life](#) there is nothing like it. In my experience, it makes a big difference if you have access to it or not. If you don't have access to it, you learn not to ask too many [questions](#), because you learn to feel that asking questions won't get you anywhere. If I would like to know more about you and it creates a lot of costs and pain to find out more about you, then I would probably stop to want to know more about you. I can ask questions, but if I can't really act on that, I will stop asking.



Intranet wireframe for Schlumberger
Kahn & Associates, 2006

Having the experience of that kind of power is great, to be able to act immediately on your thoughts and interests. In my own life there is nothing like it.

How do you navigate through this enormous amount of information as a consumer and as an information designer?

I think you need good tools, a good search engine is a very important one. We are involved now in a project, building tools for a social science research. We are hoping to come up with better tools for visualizing collections that you find or that you build yourself. I also believe that system maps improve communication, and as the person who is involved in making these maps I find that the process to make the map is part of the process of understanding. If you can create the visualization you have a great understanding of how things go together.

We make these maps in Illustrator because the program is very flexible, and by drawing them we make numerous selections, decisions and choices. For me this is the most pure form of [information design](#). We use the maps for creating a synoptic overview of a complex system for a particular audience. We don't use web mapping software. The mapping tools I have seen are often good for the IT-group that is running the website, but they are not very good for anything else. They are only designed to show you what's there in an objective sense.

Sometimes what's there is a mess and showing it is not really useful. The maps we made for the Bibliothèque nationale de France (French National Library) don't pretend to show you the entire website, because if they did you wouldn't be able to see things.

You worked on various online encyclopaedias, the Britannica Online and the McGraw Hill Sciences and Technology Encyclopedia and also revised the website of the French National Library. What does the ideal course of a project look like aimed at mastering such complexities?

First we do an analysis and a visualization of the analysis, an overview of what there is now and of what we would like to create. This is a way to visualize for the client what's important to them. Then we work out wireframes of major pages. These are without design, but they do represent all of the functions on major pages. The relationship between the overview map and

the wireframes is often not obvious to people. The people who are involved in software development need the wireframes, they can't work with the overview map. Once we have agreement for all of that, we do the visual design. We work on user interface applications and design websites and intranets and in each case we follow more or less the same process. The level of organization is intellectual first. Understanding what the audience and the information is, finding the best compromise between the way the organization wants to represent itself and the way people find the information. This is a more user-centered, rational way of designing. The overall system affects every single part.

People's desire to design things from the homepage out creates many problems and people's desire on the IT side to design it from the [database](#) out creates many problems, too. You optimize something from the program and it can be very difficult for people to use. If you come up with an image or color scheme that you think is great, it may have no relationship to the information you are trying to transfer. We try to overcome both those problems by creating an overview of the structure first, and then the detail of the structure and then doing the visual design. We try to do that with an understanding of what the technology system can and can't do. We don't want to propose a structure that the technology can't support.

Do you always work in different interdisciplinary groups?

In the best of all possible worlds, we are working with all of the different groups, software developers and communications people. The clients have often their own programmers.

What is the most complex information structure you have developed in your career?

The largest user interface project that I worked on was for Schlumberger, a global oilfield and information services company.

We redesigned the user interface of their intranet, rebuilding the editorial system for a large content management system that is used by their global intranet. They have about thousands of authors for that system. It's a customized system and now it is used by tens of thousands of users every day and about 3000 authors contribute to it. We developed a new user interface and IT services provider Atos Origin implemented it.

To what extent do you apply standards and universal principles of design?

I am not hostile to [standards](#), but I think standards are only one factor. Another factor is the identity of the client that you are working with. We certainly try and use standards if they apply.

Do you follow all the new developments in the World Wide Web?

I think about it a lot, for two reasons. I am engaged in this both as a practitioner, as a business person, and as an educator. Things change from year to year, so I try to pay attention to how they are changing. The areas that are most interesting to me right now are how much non-textual media has advanced. There is an enormous amount of audio and video available now in the Internet and people love to use it, add to it and play with it. It has reached a critical mass in the last two years. And it makes more real the question that we often ask: What would happen if it was all there?

In France, the national archives for audiovisual material, INA, has every television program from 1945 until yesterday. They have digitized almost all of it and a few percentage of it is available on their website. So you would have all this material available for you, but what are you going to do with it? If you wanted to look at every news program that mentioned the Dutch influence on Indonesia for the last fifty years, how would you find it, and once you found it, how would you organize it, what would you do with it? You don't ask the question now, because you couldn't possibly do it, but it is all there somewhere.

Suppose it all existed and you could address all of these things, you could find them and you could organize them. What would make sense if I followed the link and I arrived at this particular news program. I was looking for the newscaster, the date, the subject, but where should I be able to go from there? You can find these examples now on the Internet without universal knowledge access. There are already archives on the web, you can find material, you find this node. From the information design point of view, it is interesting to think about how the system should be designed, so if you arrived at this node, what should the possibilities be? What kind of [metadata](#) structure will really help? I remember the first time I walked into a video store 20 years ago and I saw hundreds of

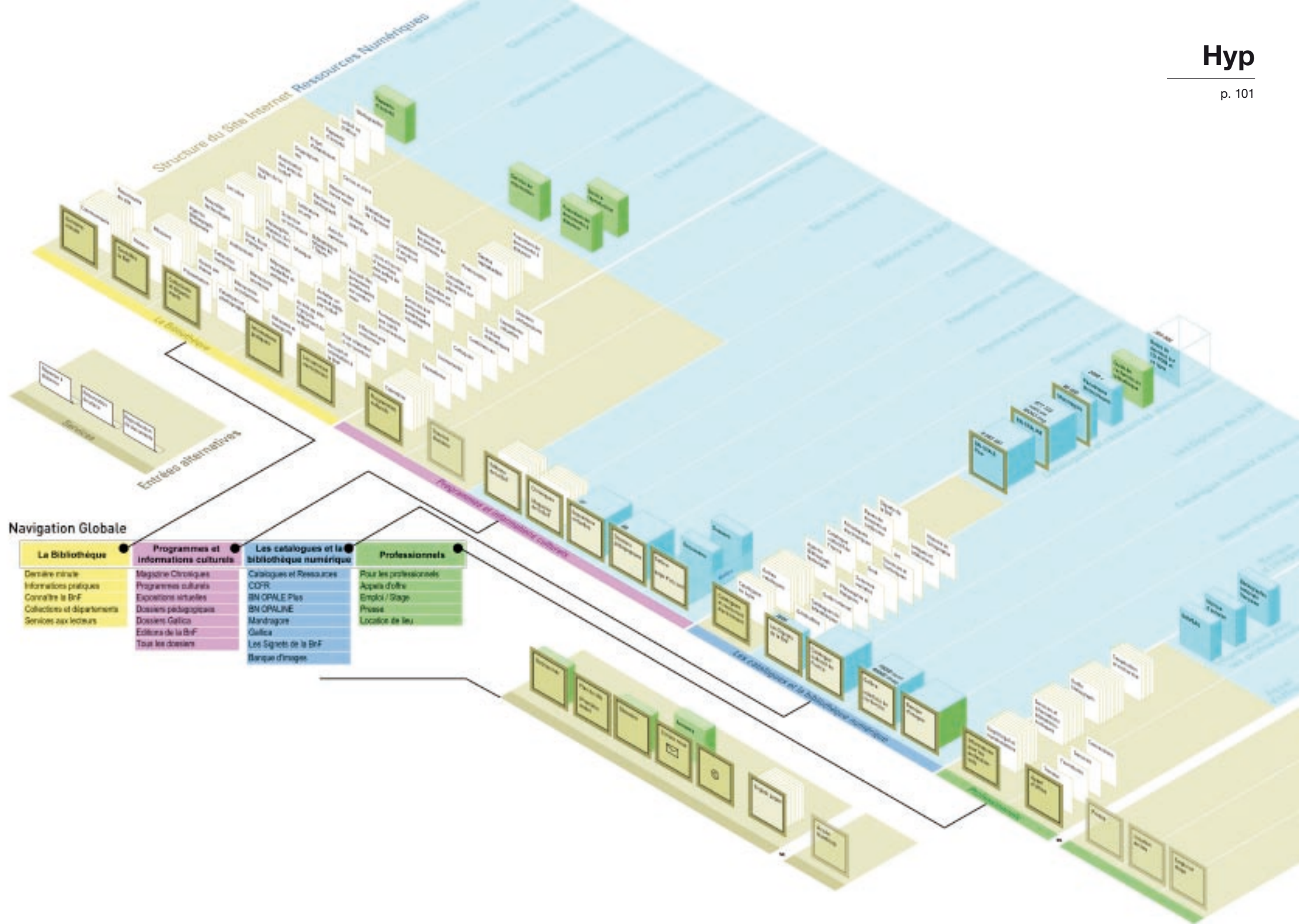
movies that I could just pick up and walk home and watch at any moment. It changed my attitude about film. I had hundreds of movies in my head, but I never thought I would see them again and suddenly there they were. It is the same kind of image that you have with Bush's Memex. All of a sudden, not only do you remember all of these books, but they are there to look at, at any particular moment. And if you have all of this in a form where it is available any moment, from an information architecture point of view, not from a legal or physical point of view, the question is:

What should you do to make it easier? Both to find the things you are looking for and once you found something to find relationships between those things.

That's what I am most interested in. I am trying to deal with it both as an educator, to try and make students recognize this as an issue, and professionally, trying to find opportunities where people pay me to come up with solutions. The wonderful thing about the Web is, it gives you exposure to a huge amount of information very fast and I hope that that kind of exposure will increase people's awareness of some level of transparency.

You can see through certain limits that are created by the media. Everyone who is telling the whole story is lying. Everyone is never telling the whole story, and at some point you might have a different kind of a media that really is representing itself as presenting you with components instead of packaging it all and pretending to tell you the whole story.

Does it make a difference if the digital knowledge belongs to a private firm like Google



Website structure of the French National Library
Kahn & Associates, 2004

Book Search or a public institution or library?

In the future, the difference between those two will be how well does one or the other have an interface that I can work with. The difference will be the ease of use, the user interface design and information design. Concerning the [copyright](#) issues, I believe that for all digital libraries the copyright wall will dissolve. They will work it out some day, and it won't be such a big deal anymore.

I was looking for a certain English book recently, so I learned how to use [bookfinder.com](#). It is an aggregated search of some enormous number of bookstores over the whole world. You ask for a book and it gives you a list of places that have the book for sale. You choose it and then it transfers you to any number of places where you actually make the purchase. Sometimes it involves making a phone call or writing an e-mail, but you are able to find the book. I was able to find this book in a bookstore in the UK. It would have been an enormous amount of work to find it without this type of system. In this case, it works well for a book that you are aware of. It takes some time to get it, but then you have it.

That in itself is a wonderful example of just connecting. You have got a moment when you have an interest or desire and you got a whole network of people out there who might have what you are looking for but they have a limited amount of bandwidth for people who happen to walk into their store. They make the effort to connect themselves to this network and now they have what they want, and I have what I want. If that could be transferred to me in some more efficient way, that would be nice, too. If that were given to me as an [e-book](#) and I had some comfortable way of reading it as a digital book, I would be happy to take it. The infrastructure behind all this is almost incomprehensible, how many different layers of infrastructure are going on. If all the bookstores and all book publishers go out of business that would be too bad, but they are not that important. What's important is that the information is still there and flowing and people like you who want to make a publication have a way of creating what you want and have a way of communicating it to people.

The interview was conducted in Paris (F) on February 21, 2008.



Index Librorum Prohibitorum
List of prohibited books, published by the Roman Catholic Church, 1559-1967

Index, or reference list, a tabular list of all important units, often words, of a text with associated pointers, referring to their location in the text document. In a traditional book index the words are selected by the author in regard to his concept marked with page numbers.

The first index in the traditional sense was introduced by Antonio Zara, the Bishop of Petina, in 1614 in his [encyclopaedia](#) 'Anatomy of Talents and Sciences'.

Infoplease, the world's largest free reference site. In addition to an online encyclopaedia it also offers a [dictionary](#), an [atlas](#) of the world and an almanac. The site belongs to Pearson plc., an English media conglomerate and the largest publisher in the United Kingdom.

The roots of Infoplease lie in the American radio [quiz](#) show 'Information Please', which was broadcast from 1938-1952. The concept of the show allowed readers to ask [questions](#) that were then answered by experts on the show. In 1947 an Information Please Almanac was published and in 1998 the online offer with the pay-off 'All the [knowledge](#) you need'. [infoplease.com](#)

Information anxiety

Seeing the world as visual patterns of connectivity

Richard Saul Wurman

His own curiosity and lack of understanding are Richard Saul [Wurman](#)'s motivation to make the complex clear. Gerlinde [Schuller](#) talked with him about his insatiable thirst for knowledge and the transformation of data into understandable and useful information.

For more than forty years, your passion has been to make complex things understandable. You have written and designed more than eighty books on information theory, information architecture, healthcare, cartography, sports, children, and finance. Where does this diverse interest come from?

My passion is, in the simplest term, to make things that interest me understandable to myself. However, that is to make complex things, which I don't understand, clear. To bring clarity, not [simplicity](#). In my mind there is a big difference between clarity and simplicity. There is this movement of making things simple as being better, that's often the dummied down of things. My passion is driven by my interest. I don't care about [universal knowledge](#). I care about selective things that I don't understand. The things I want to make understandable are big, general subjects – cities of the world, healthcare, understanding children – they're big generic subjects. Therefore it takes in a lot, but it's not driven by the great washed and unwashed out there. It's driven by my own stupidity.

What was the first trigger in the 1960s that got you to deal with making information understandable?

I had a moment of deepest terror, where I realized I didn't understand anything. That was just before I graduated from architecture school. I was probably twenty-one. I do remember it because I reflected back on it continuously. It was terrifying, and it still is. You don't lose your terror, what you do is to understand it better. I know what I'm terrified of so I can survive

better. I accept my terror and most people do not accept their terror. I try to understand my terror. Patterns that exist, patterns that don't exist. It's this nothingness, this zero that I am at every day and certainly at the beginning of any project. Louis Kahn said: 'Beginnings, beginnings, beginnings, beginnings, I love beginnings'. I feel that to my soul that it is this beginning of things when you know nothing is what I love. He loved the beginnings because they were empty, they were void, and there was no preconception. The fundamental rule I have is how to understand what it is like not to understand.

Is it this diverse interest, which made your work so interdisciplinary? You write, you design, you organize conferences.

I can look back on my [life](#) and say 'Yes, I guess that's why I did it', but I wasn't conscious of doing it. I don't have this plan; I did things because they interested me. I am much simpler than a question like that.

If I get fascinated about the growing of tomatoes, I would do a project about that. In fact I am a little fascinated with the growing of tomatoes because I sat next to somebody on a plane a week ago, who told me very interesting things about tomatoes. This is a good example because it doesn't have anything to do with my life at the moment. Everything has the potential to be equally interesting. You know, we have approximately 100 trillion cells in our body, and only half of them are human and half of them are animal, yet we call ourselves a human being. I refer to myself as a [zoo](#), because there are so many other animals that are depending on me to live and I am depending on them to live. There is an arrogance of calling any species a species when these little things are called species when you study them separately. So if half of these little species that Larousse Dictionary of Life Forms calls a species and they just happen to be in here or on my eyelids or some place, I can't say that I'm a species. I am a zoo!

The way of looking at the same thing in a different way fascinates me. That permission-giving to not accept the simplest things about our life. I was led to believe that all life on earth was dependent on a cycle of photosynthesis, with the sunlight as an energy source. In 1977, more than a mile down in the Pacific, they found black smokers, a type of hydrothermal vent.