

Everything is miscellaneous

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Topic Maps

Oslo



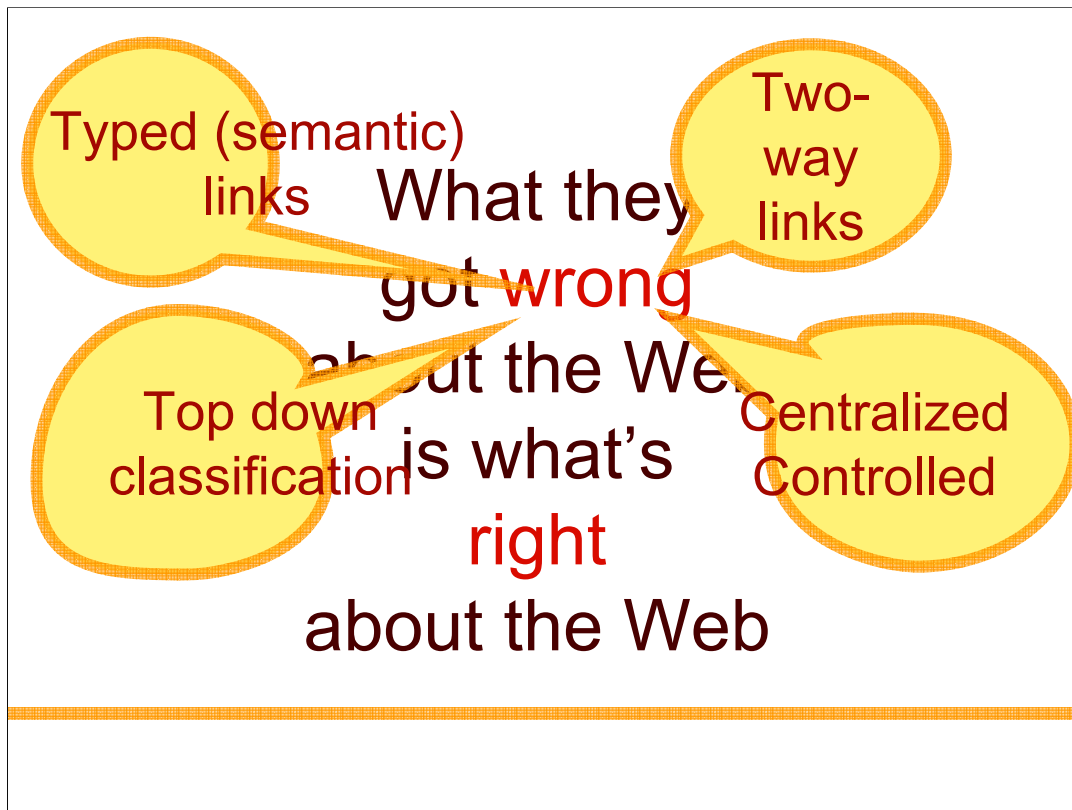
I very much enjoyed Alex's excellent keynote yesterday. It's good to remember that ideas have histories For one thing, it keeps us humble. But I want to disagree with him a bit, although in a way I strongly suspect he actually agrees with.



Alex pointed to Paul Otlet, Vannevar Bush, Ted Nelson and even Sir Tim Berners Lee's Enquire project as having precursor ideas about the Web, some of which were better than the Web that actually came to be.



But, what was better about the web that these folks envisioned actually would have kept the Web from existing.



They saw typed links, two way links, with top down classification and centralized control. Ted Nelson's Xanadu, for example, required a central registry to achieve the two way links and to enable authors to have economic control over their works.

END-TO-END ARGUMENTS IN SYSTEM DESIGN

J.H. Saltzer, D.P. Reed and D.D. Clark*

M.I.T. Laboratory for Computer Science

This paper presents a design principle that helps guide placement of functions among the modules of a distributed computer system. The principle, called the end-to-end argument, suggests that functions placed at low levels of a system may be redundant or of little value when compared with the cost of providing them at that low level. Examples discussed in the paper include bit error recovery, security using encryption, duplicate message suppression, recovery from system crashes, and delivery acknowledgement. Low level mechanisms to support these functions are justified only as performance enhancements.

Introduction

Choosing the proper boundaries between functions is perhaps the primary activity of the computer system designer. Design principles that provide guidance in this choice of function placement are among the most important tools of a system designer. This paper discusses one class of function placement argument that has been used for many years with neither explicit recognition nor much conviction. However, the emergence of the data communication network as a computer system component has sharpened this line of function placement argument by making more apparent the situations in which and reasons why it applies. This paper articulates the argument explicitly, so as to examine its nature and to see how general it really is. The argument appeals to application requirements, and provides a rationale for moving function upward in a layered system, closer to the application that uses the function. We begin by considering the communication network version of the argument.

In a system that includes communications, one usually draws a modular boundary around the communication subsystem and defines a firm interface between it and the rest of the system. When doing so, it becomes apparent that there is a list of functions each of which might be implemented in any of several ways: by the communication subsystem, by its client, as a joint

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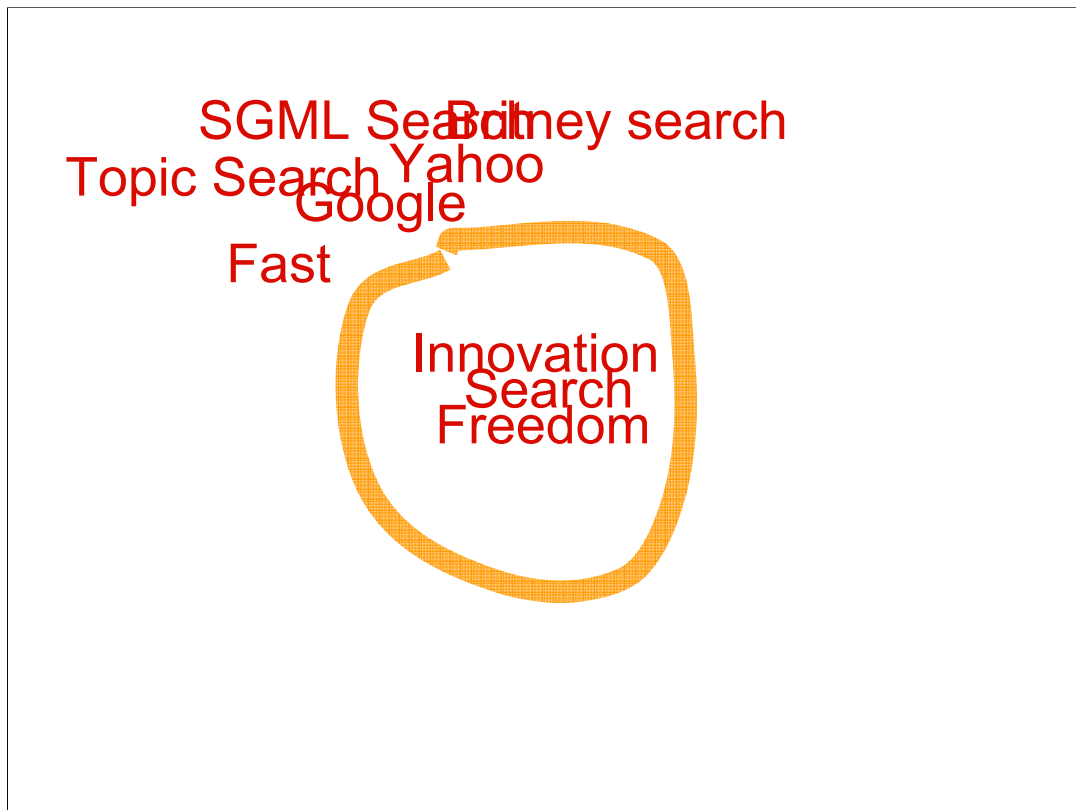
Revised version of a paper from the Second International Conference on Distributed Computing Systems, Paris, France, April 8-10, 1981, pp. 509-512. Copyright 1981 by The Institute of Electrical and Electronics Engineers, Inc. Reprinted with permission.

Published in ACM Transactions in Computer Systems 2, 4, November, 1984, pages 277-288.

Reprinted in Craig Partridge, editor Innovations in internetworking. Artech House, Norwood, MA, 1988, pages 195-206. ISBN 0-89006-337-0. Also scheduled to be reprinted in Amit Bhargava, editor. Integrated broadband networks. Artech House, Boston, 1991. ISBN 0-89006-483-0.

Scribe/FinalWord source: <http://web.mit.edu/Saltzer/www/publications/>

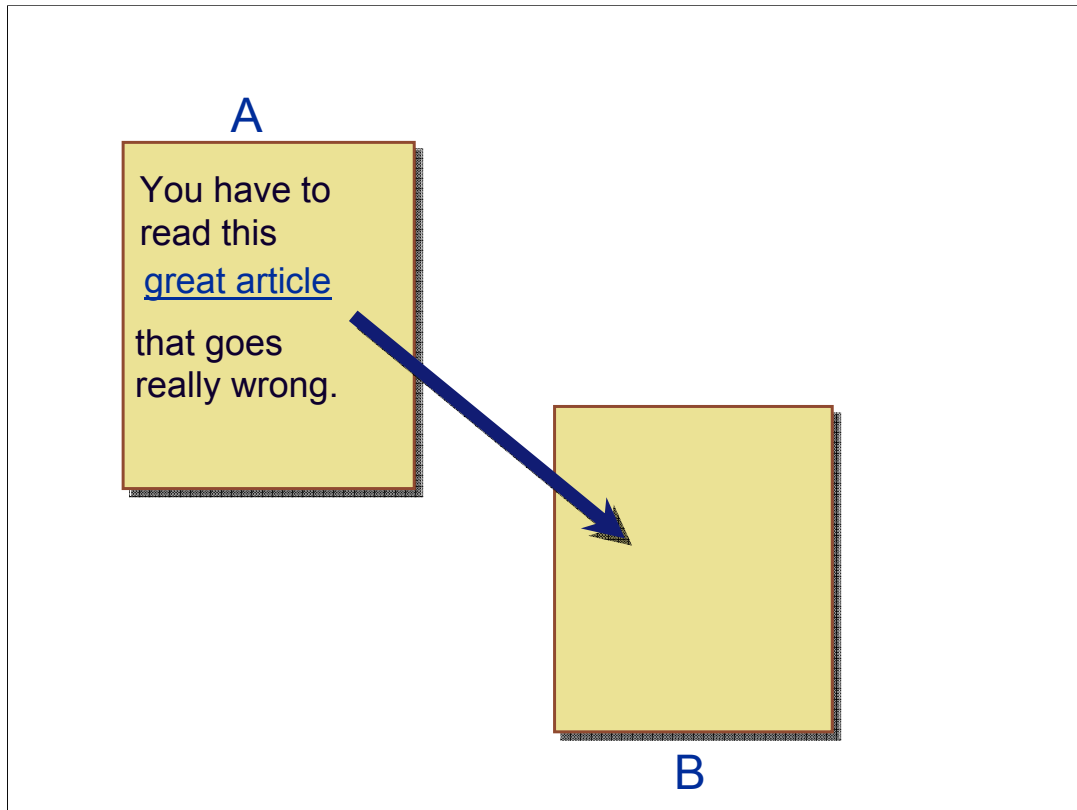
The Internet as we know it had a foundational moment in 1981 with the publication of the end to end argument, by Saltzer, Reed and Clark. It argued, counterintuitively, that the best network would have the fewest possible services built into it.



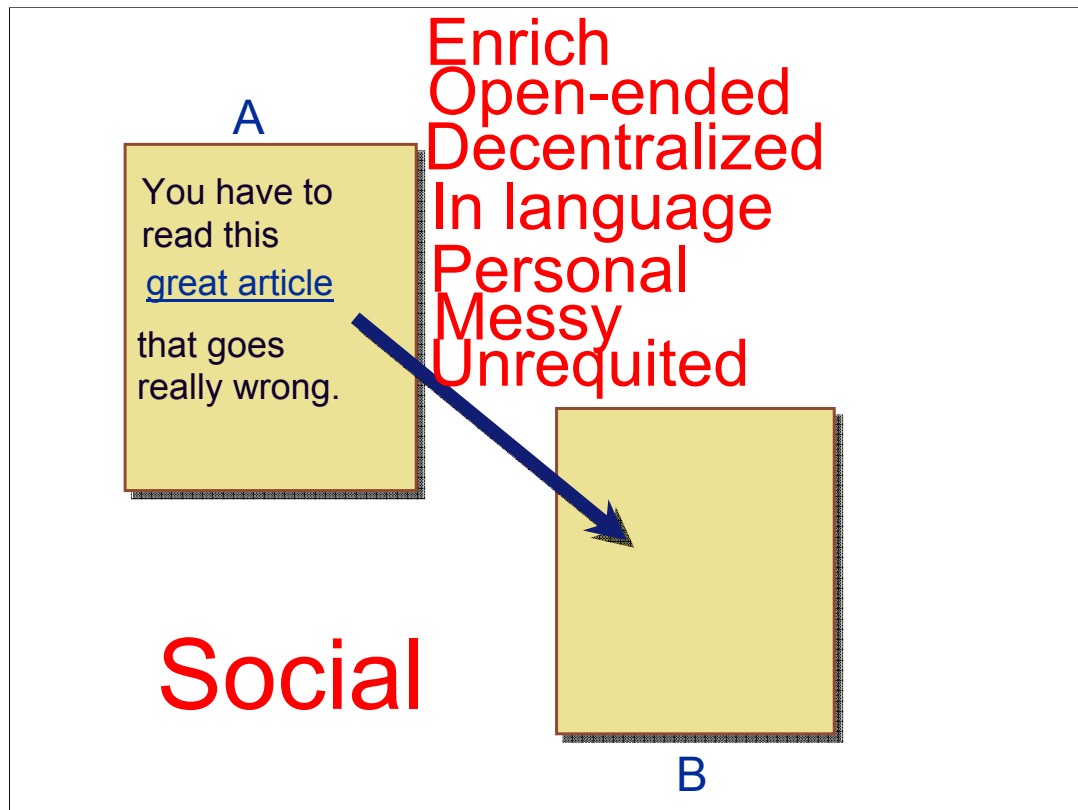
end to end keeps services out of the center. Instead of building in search, for example, which you can anticipate everyone on the Net is going to want, you keep it out of the center. As a result, You get Google. But, you get other search engines. Most important, you get innovation and freedom as network properties, because you don't anticipate what people need. Thus, no typed links.



Thus, no typed links built in. The architecture of the Web has links as a built-in service, but the typing happens on the edge.



Not only does this make hyperlinks so easy to use. It also means the typing is done in language.



Hyperlinks enrich...etc. They bring much more meaning.



These are typed links.

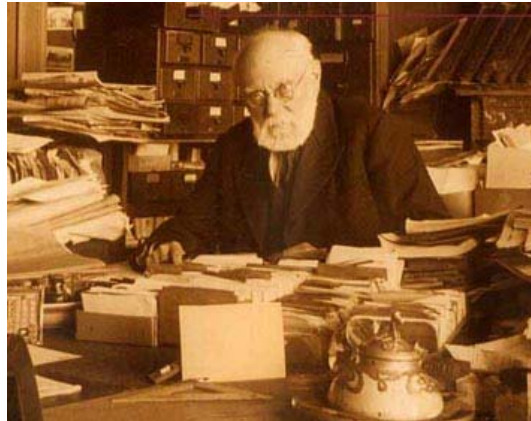


The openness and ease of the Web leads to abundance...including an abundance of meaning.

Abundance

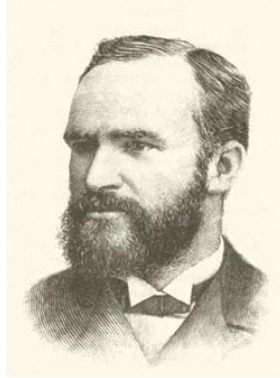


we get an abundance of good and an abundance of bad. We've tended to focus on how to protect citizens from the bad, but if an abundance of crap is worrying, abundance of good is terrifying.



For example, the fact that ten years later, they've only catalogued a tenth of Otlet's library indicates the problem with abundance. The old methods don't scale.

Melvil Dewey



The problem is that our old methods don't scale.

100 Philosophy & psychology
 101 Theory of philosophy
 102 Miscellany of philosophy
 103 Dictionaries of philosophy
 104 Not assigned or no longer used
 105 Serial publications of philosophy
 106 Organizations of philosophy
 107 Education, research in philosophy
 108 Kinds of persons in philosophy
 109 Historical treatment of philosophy
 110 Metaphysics
 111 Ontology
 112 Not assigned or no longer used
 113 Cosmology (Philosophy of nature)
 114 Space
 115 Time
 116 Change
 117 Structure
 118 Force & Energy
 119 Number & quantity
 120 Epistemology, causation, human nature
 121 Epistemology (Theory of knowledge)
 122 Causation
 123 Determinism & indeterminism
 124 Teleology
 125 Not assigned or no longer used
 126 The self
 127 The unconscious & the subconscious
 128 Humankind
 129 Origin & destiny of individuals
 130 Paranormal phenomena
 131 Occult methods for achieving well-being
 132 Not assigned or no longer used
 133 Parapsychology & occultism
 134 Not assigned or no longer used
 135 Dreams & mysteries
 136 Not assigned or no longer used
 137 Divinatory graphology
 138 Physiognomy
 139 Phrenology
 140 Specific philosophical schools
 141 Idealism & related systems

129 Origin & destiny of individual souls

130 Paranormal phenomena

131 Occult methods for achieving well-being

132 Not assigned or no longer used

133 Parapsychology & occultism

134 Not assigned or no longer used

135 Dreams & mysteries

136 Not assigned or no longer used

137 Divinatory graphology

138 Physiognomy

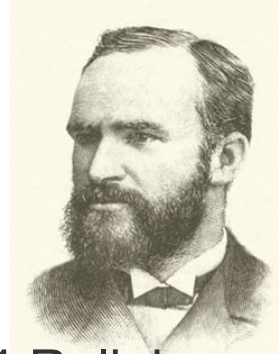
139 Phrenology

207 Education, research in Christianity
 208 Kinds of persons in Christianity
 209 History & geography of Christianity
 210 Natural theology
 211 Concepts of God
 212 Existence, attributes of God
 213 Creation
 214 Theodicy
 215 Science & religion
 216 Good & evil
 217 Not assigned or no longer used
 218 Humankind
 219 Not assigned or no longer used
 220 Bible
 221 Old Testament
 222 Historical books of Old Testament
 223 Poetic books of Old Testament
 224 Prophetic books of Old Testament
 225 New Testament
 226 Gospels & Acts
 227 Epistles
 228 Revelation (Apocalypse)
 229 Apocrypha & pseudepigrapha
 230 Christian theology
 231 God
 232 Jesus Christ & his family
 233 Humankind
 234 Salvation (Soteriology) & grace
 235 Spiritual beings
 236 Eschatology
 237 Not assigned or no longer used
 238 Creeds & catechisms
 239 Apologetics & polemics
 240 Christian moral & devotional theology
 241 Moral theology
 242 Devotional literature
 243 Evangelistic writings for individuals
 244 Not assigned or no longer used
 245 Texts of hymns
 246 Use of art in Christianity
 247 Church furnishings & articles
 248 Christian experience, practice, life
 249 Christian observances in family life
 250 Christian orders & local church
 251 Preaching (Homiletics)
 252 Texts of sermons
 253 Pastoral office (Pastoral theology)

296 Judaism

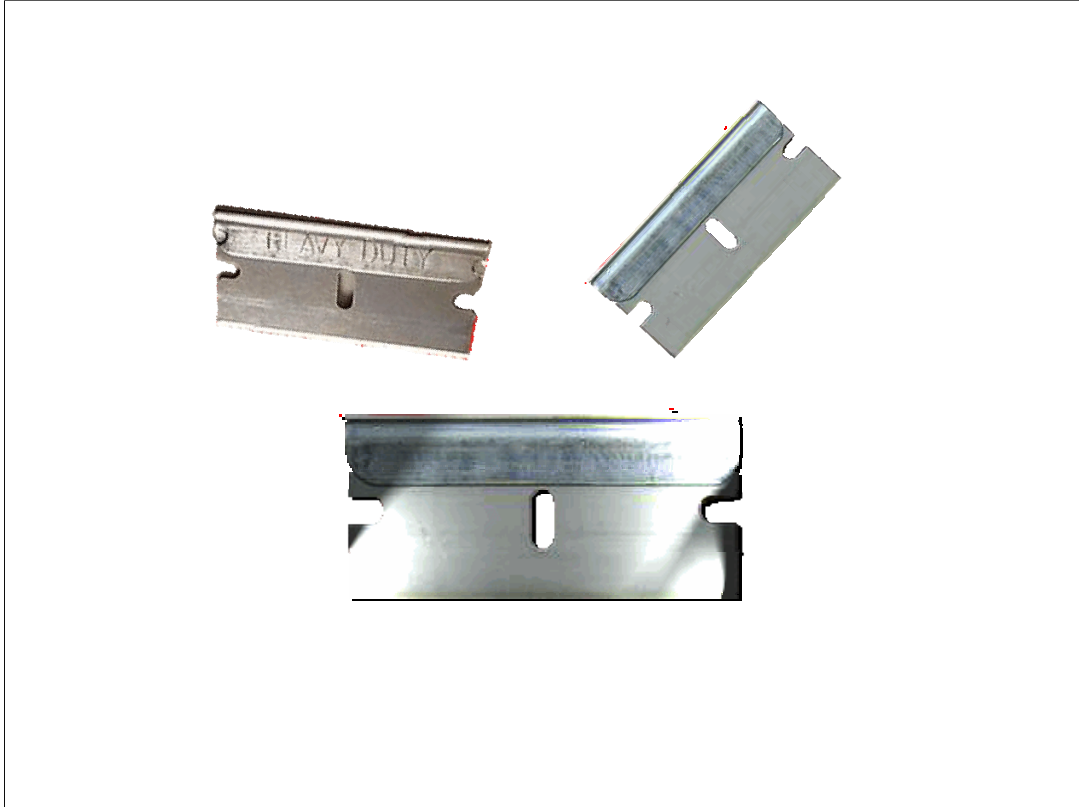
297 Islam & religions
originating in it

295 Zoroastrianism



294 Religions of Indic Origin

294.3 Buddhism



Why hasn't it been fixed? Because we don't agree.

The real's evil purpose:



The problem is that we don't agree but we've had to make single choices. We have to give everything it's place because reality's evil purpose is in fact to make sure that every thing is in a place and no two things are in the same place at the same time...



No matter how hard we try



When everything has its place, place takes on political significance — limited space, and a single order. Somebody has to decide what goes in the space 2/3s of a meter square, and where it goes. Those who decide what is worth our attention and how important is have authority and power. Usually they do a good job. The limitations of the real gives rise to politics, power and authority.



Nothing is
miscellaneous

Take a step back to look at why we're able to organize our world. Because, although everything is miscellaneous, we never let it stay that way. We can't. We have to classify and categorize.



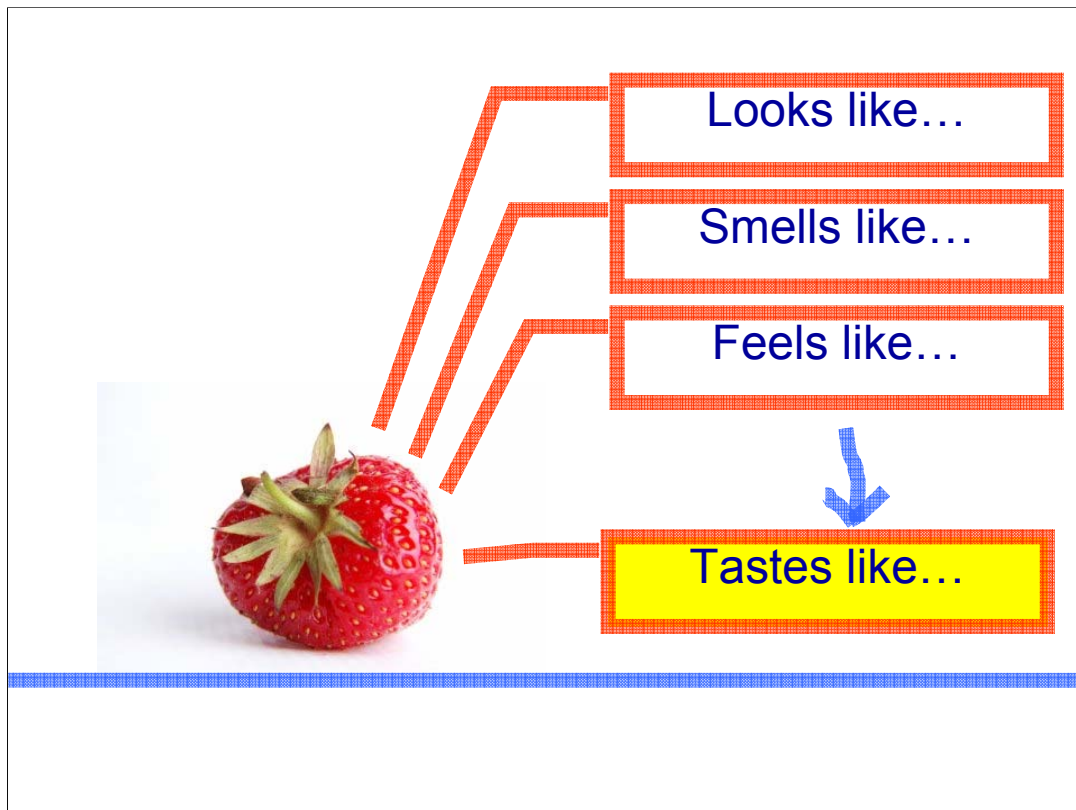
Things I can throw at my orange
cat to get her off the couch

Classification puts like next to like.

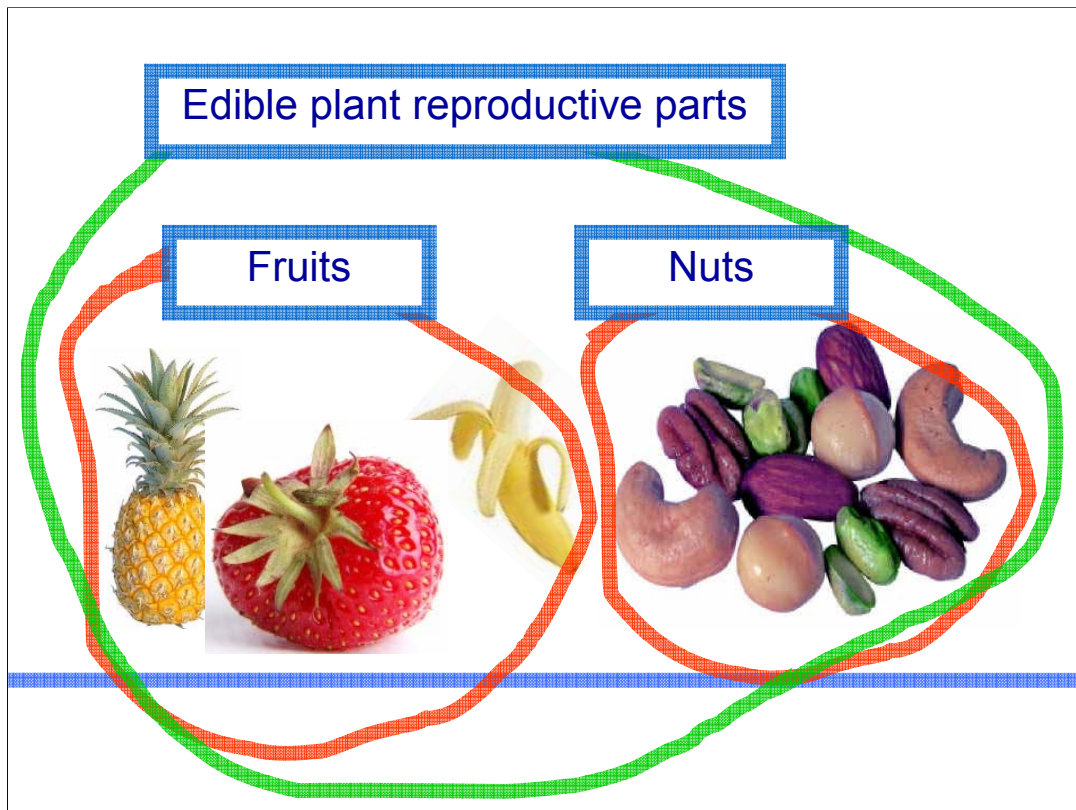


Classification puts like next to like. Of course, we get to choose what trait we're comparing. So, at one moment we may put the curry powder with the oregano because they're both flavorings, and at the next we might put it with hot things or Indian things.

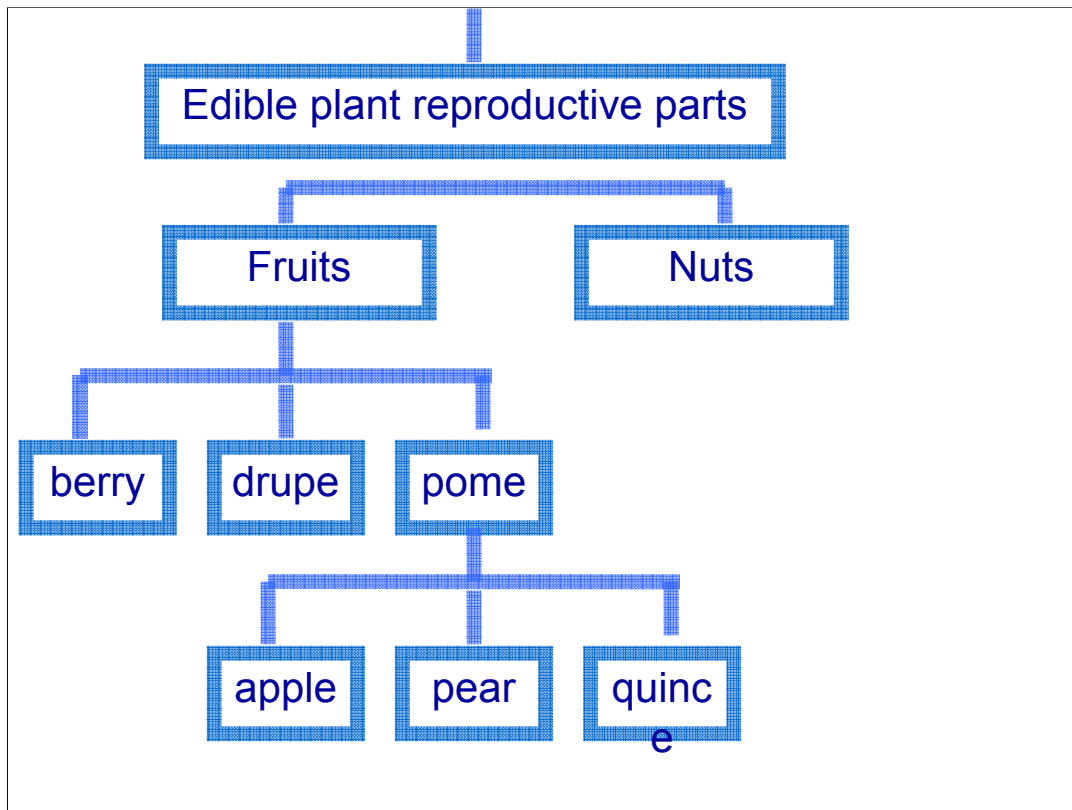
Not much is riding on where we put the curry. It's really just a matter of convenience.



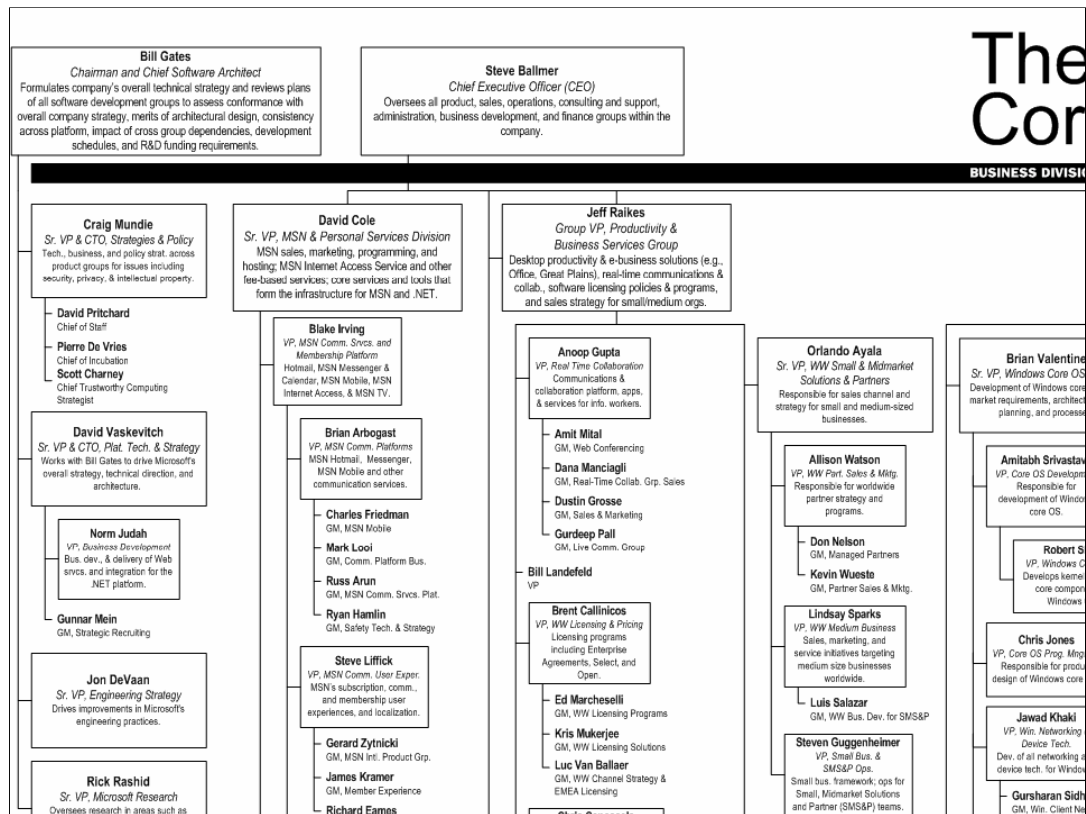
Classification is possible because if an object looks like other strawberries, smells like them, and feels like them, it's a good guess that it's also going to taste like them and be digestible like them. There are a number of ways that can go wrong, but usually we don't end up picking pieces of wax fruit from out of our teeth.



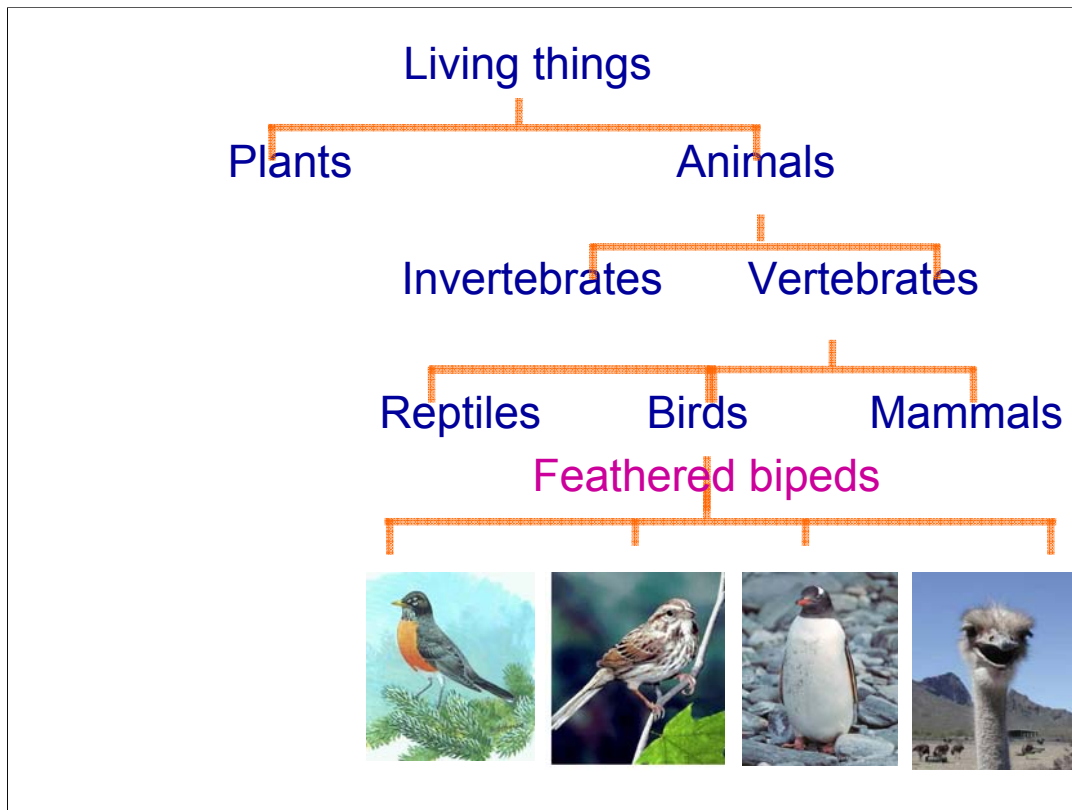
Words put like next to like, but taxonomies go further. They find an order among those clusters of likeness.



In a perfect taxonomy, everything being taxonomized has its place. The places themselves are nested hierarchically: an apple is a type of pome, which is a type of fruit, a type of plant, a type of living thing, a type of thing.



We really like this way of organizing. It's strongly typed, where the links only have one meaning.



We've defined things by their place in the taxonomy. Everything has just one place. And everything has a clear definition. We've thought that this is how the universe itself is ordered, and that our figuring out the order was figuring out the universe.



But here's where that form of order actually comes from.





Trace the history of lumps and splits and a tree of laundry emerges. Aristotle's system is bound by the limitations inherent in the physical. Everything has to go in a place. And it can only go in one place, which means there's only a single principle by which we sort any one branch.



Abelardo Morell

Topology of order shaped by paper.
Idea that there is a single way of
ordering.

Three orders of order

Here's a framing

First Order

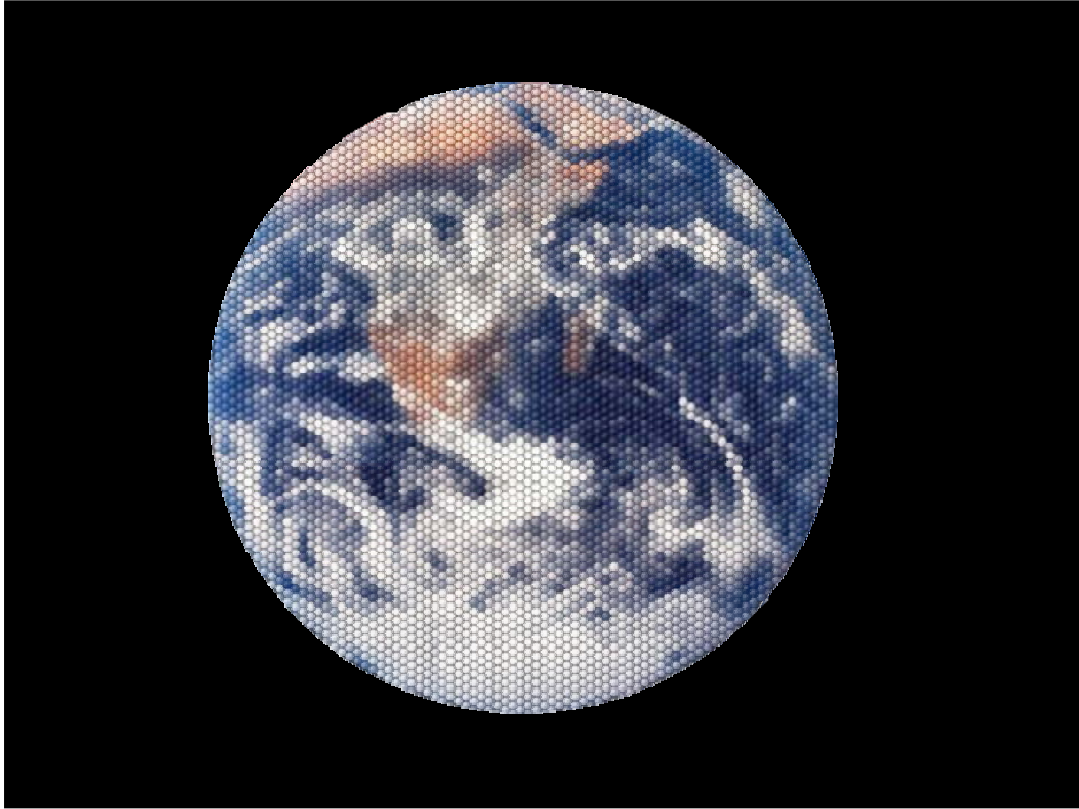


First order: Organize the objects themselves.

Second Order

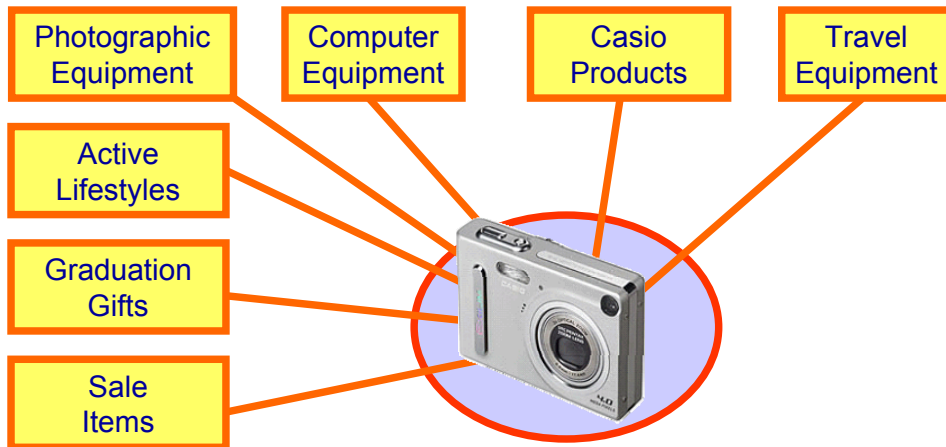


Have to reduce the data



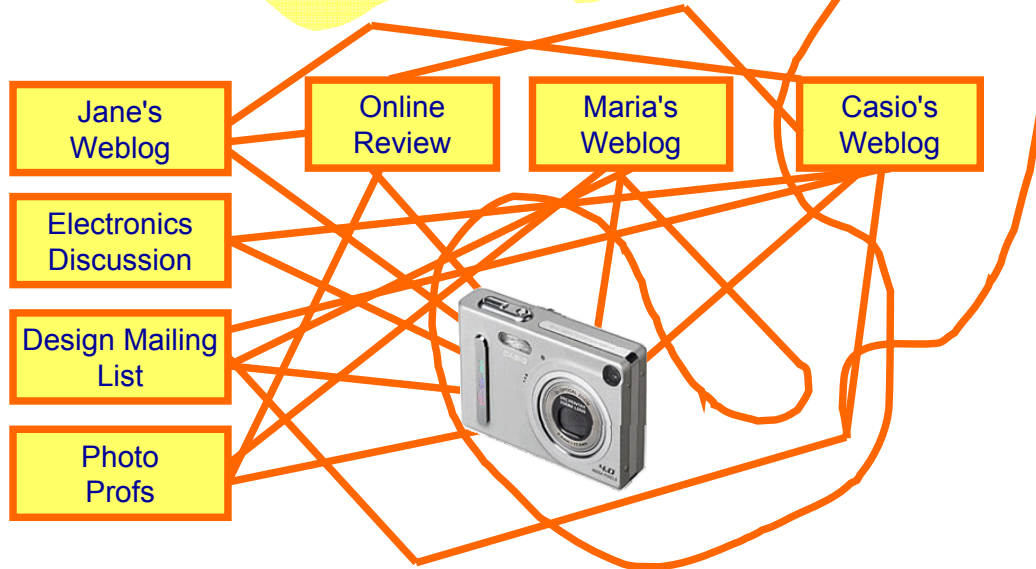
Now we're digitizing everything. It's a third order of order in which the content and the metadata are both digitized. And this changes the basics.

1. Leaf on many branches

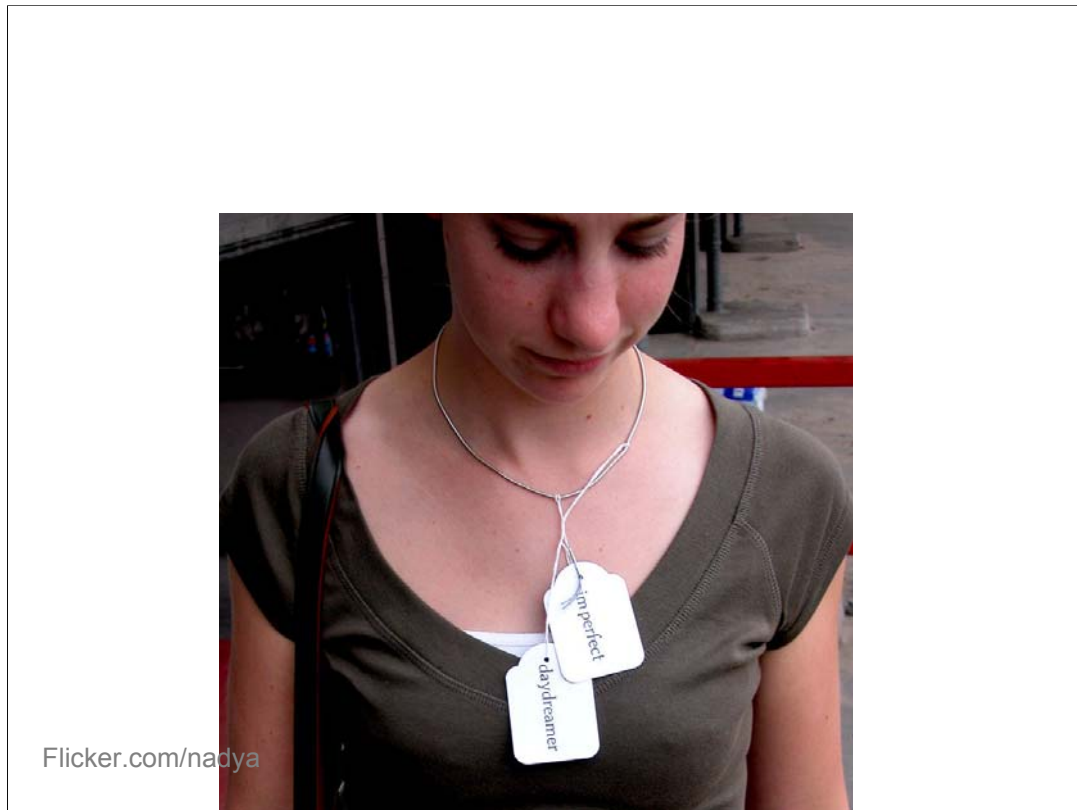


First, you can file things in as many categories as you'd like.

2. Messiness as a virtue




Neatness is a limitation we don't need any more.



We are used to the idea that there's a difference between data and metadata.

**LOOMINGS**

CALL me Ishmael. Some years ago—precisely—having little or no money in my pocket, I went out one day, feeling particularly to interest me on shore, and about a little and see the watery part of the world. I have of driving off the spleen and driving the wind from my lungs. Whenever I find myself grow-

 drizzly I have a good reason. I am naturally
 untari- the reas-
 untari- my hyp-
 the reas- strong m-
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upper
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sh Cato throws
he ship. There
new it, almost
r, cherish very
with me.

Everything now is metadata. Get it all back. Huge messy arrays



Got smarter



This, by the way, has serious consequences for what we consider to be the most basic carrier of ideas, since books are based around the idea that knowledge is to be contained, not exploded into links.

4. Unowned order



Third: Users own the organization of information.

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Subject: Topic

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- [Social conditions \(3\)](#)
- [Politics and government \(1\)](#)
- [Women \(1\)](#)
- [Description and travel \(1\)](#)

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- [AACRR \(1\)](#)

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- [New York \(State\) \(1\)](#)
- [Florida \(1\)](#)
- [Alaska \(1\)](#)
- [New York \(1\)](#)

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Subject: Era

- [20th century \(2\)](#)
- [19th century \(1\)](#)

[Brief View](#) | [Full View](#)

Sort By:

- [Stand facing the stove : the story of the women who gave America the Joy of cooking](#)
Author: Mendelson, Anne.
Published: 1996.
Format: Book
D.H. Hill Library
TX649 .A1 M46 1996 Stacks (9th floor) Available
- [Cooking with grease : stirring the pots in American politics](#)
Author: Brazile, Donna, 1959-
Published: c2004.
Format: Book
African American Cultural Center Reading Room
E840.8 .B725 A3 2004 Stacks Available
E840.8 .B725 A3 2004 Stacks Available
- [What's cooking in chemistry? : how leading chemists succeed in the kitchen](#)
Published: c2003.
Format: Book
D.H. Hill Library
TX652 .W426 2003 Stacks (9th floor) Available
- [Frolinking bears, wet vultures, and other oddities : a New York City journalist in nineteenth-century Florida](#)
Author: Cummings, Anne L. (Anne Lav), 1841-1902

Faceted example – north carolina state

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0 Item

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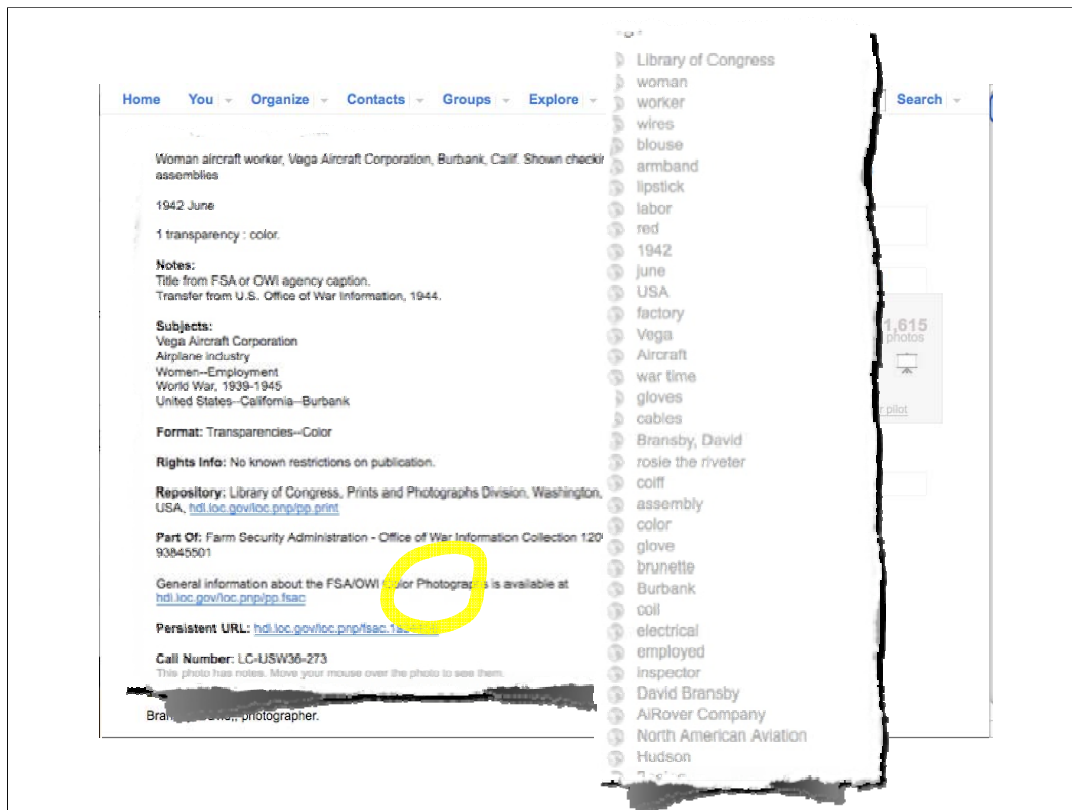
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Example of messiness adding info. The library of congress recently posted 3,000 photos from its collection at flickr because taxonomists can't keep up, it unleashed the abundance. They post the official metadata, but people contribute unexpected tags. They annotate the photo itself and conversations happen there.



[From Afghanistan With Love](#) pro says:
wonderful.. would there be room for more tags, i would have added "workforce"
Posted 2 weeks ago. ([permalink](#))



[Creature Comforts](#) pro says:
my tag would have been armband.
Posted 2 weeks ago. ([permalink](#))

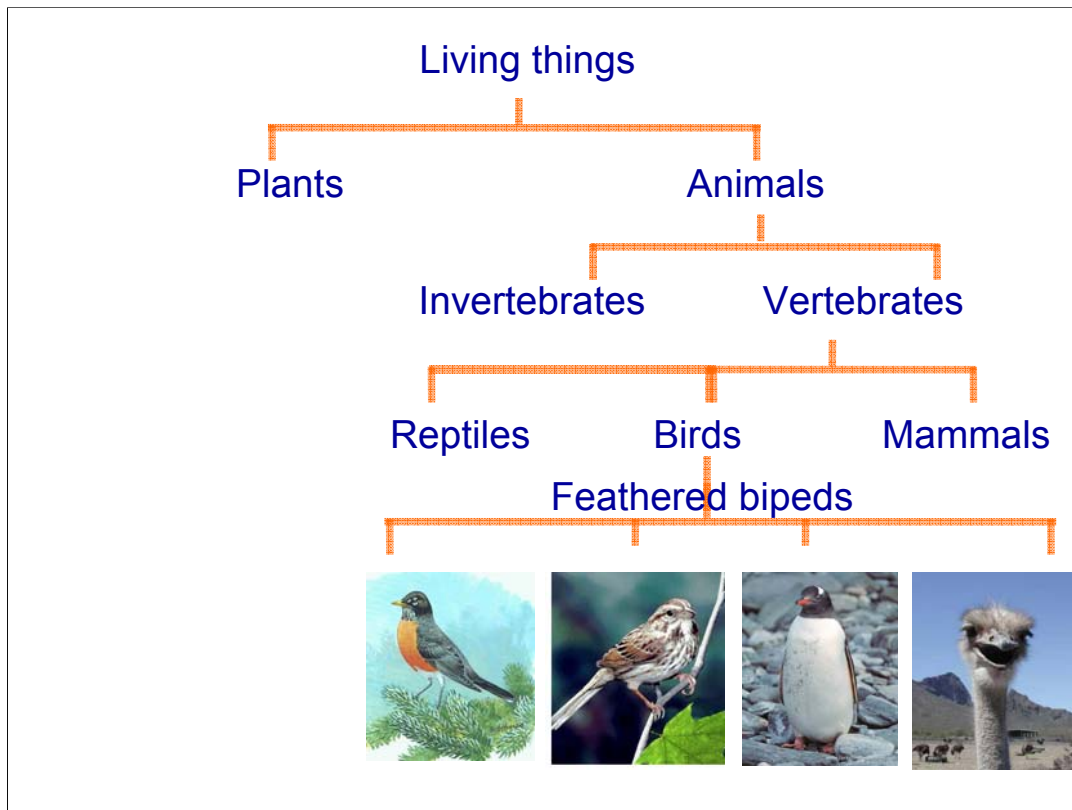


[~Terrie K~](#) pro says:
Wonderful picture that captures the era. Color and detail are fabulous.
I tried to add a tag Kodachrome but there is a 75 limit.
--

Discussion springs up. Back and forth. Variety of topics. LC jumps in. This is what's happened to the neat world of information, carefully arranged, in one place at a time. Mess but useful. Enabling mess enables info to be added and found.

What isn't said

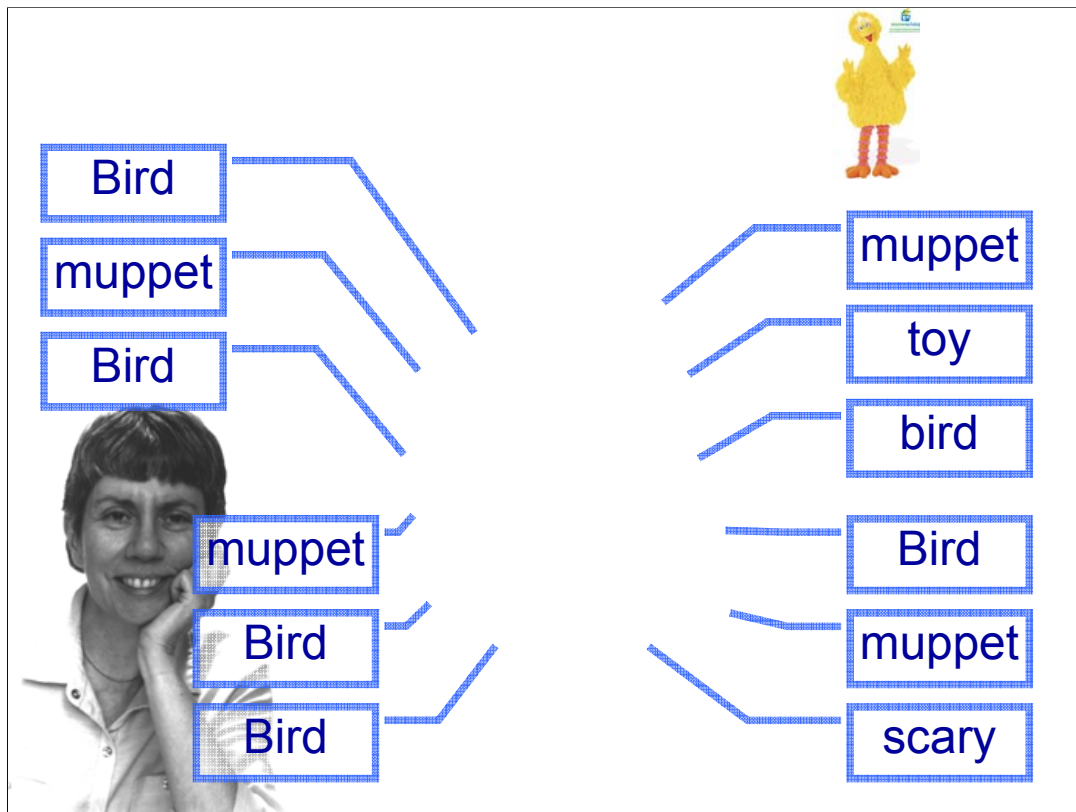
In two parts



We think things have definitions, that we know them through their definitions, and that those definitions are—or should be—clear and unambiguous.



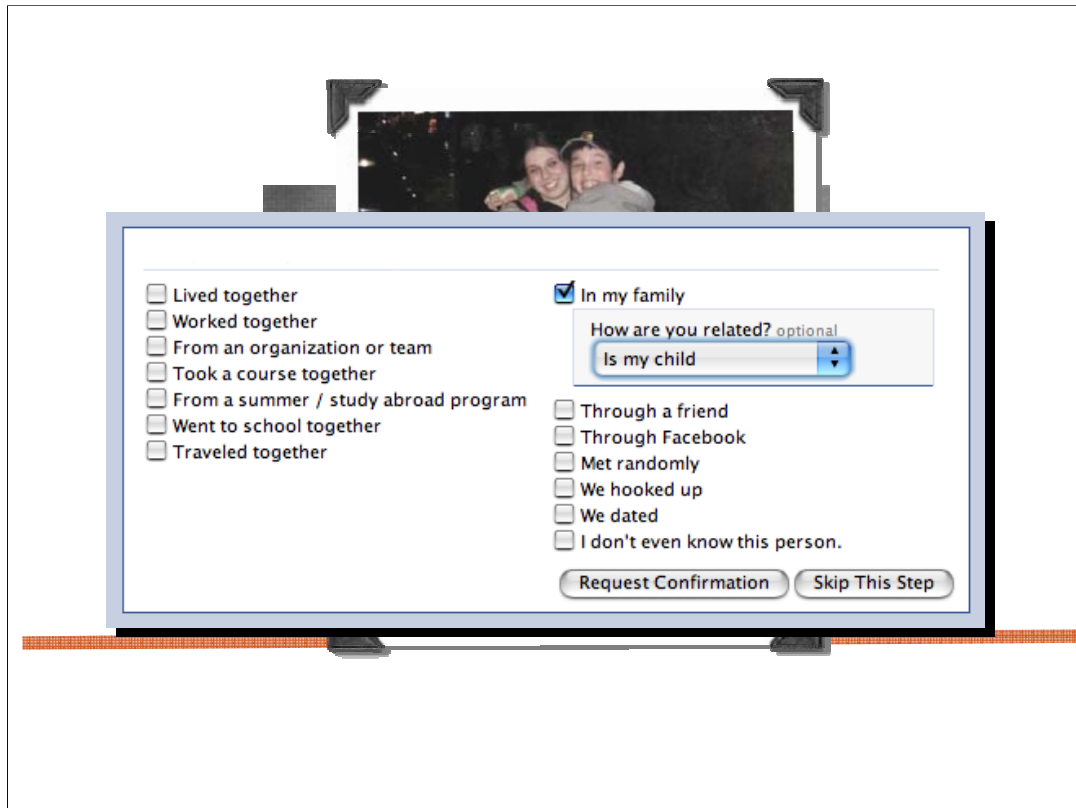
Unfortunately, that's not the way we work. Eleanor Rosch, at UC Berkeley, in the 1970s gathered the empirical evidence that we humans don't actually work the way the philosophers thought. We do not categorize, even at the level of using words, on the basis of definitions. We often cannot even articulate the definitions of words we are perfectly comfortable with. Rather, we generally learn concepts through prototype examples. Our parents point to a robin and say, "Birdie! Look at the birdie." The robin becomes a prototype of a bird, and we assimilate other animals to the bird category if they are like the robin. But they may be like a robin in various, unarticulated ways.



Tags capture this ambiguity. They don't insist on things being in one category. Something can be 73% in one and 56% in another.

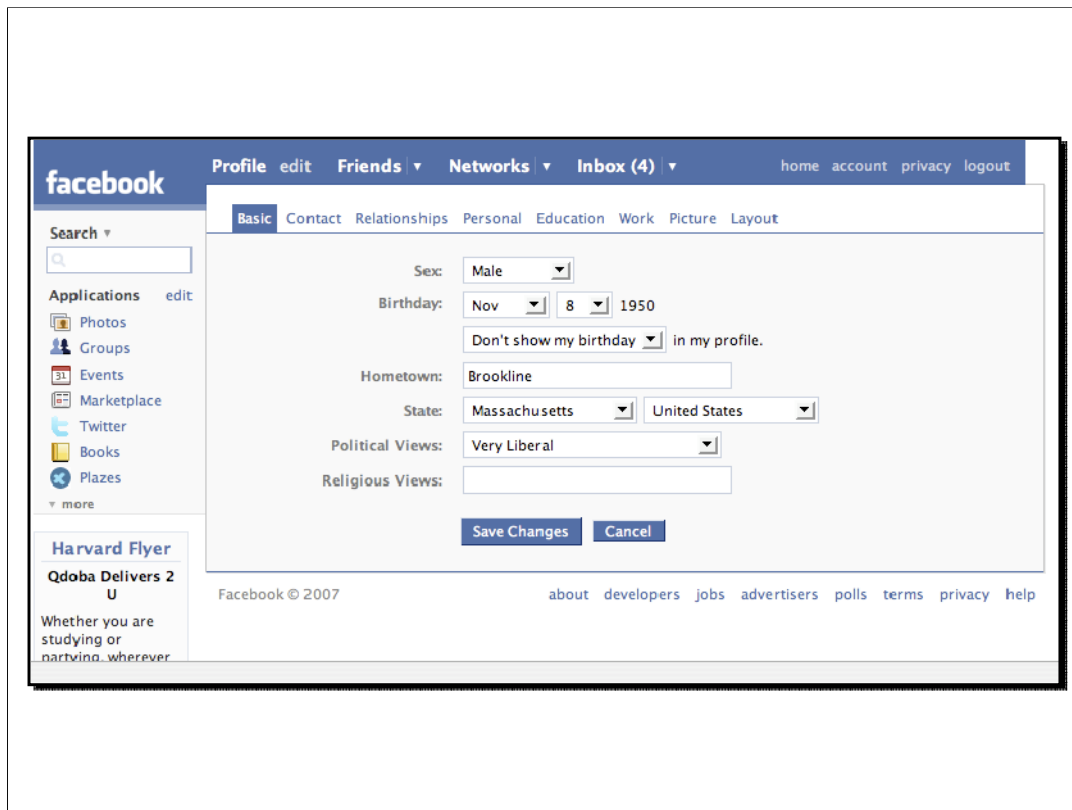


I can't tell you everything about my children. If I could, something would be wrong with our relationship.



If everything about a character can be expressed by saying she's the dumb blonde or the wisecracking sidekick, the character has failed.

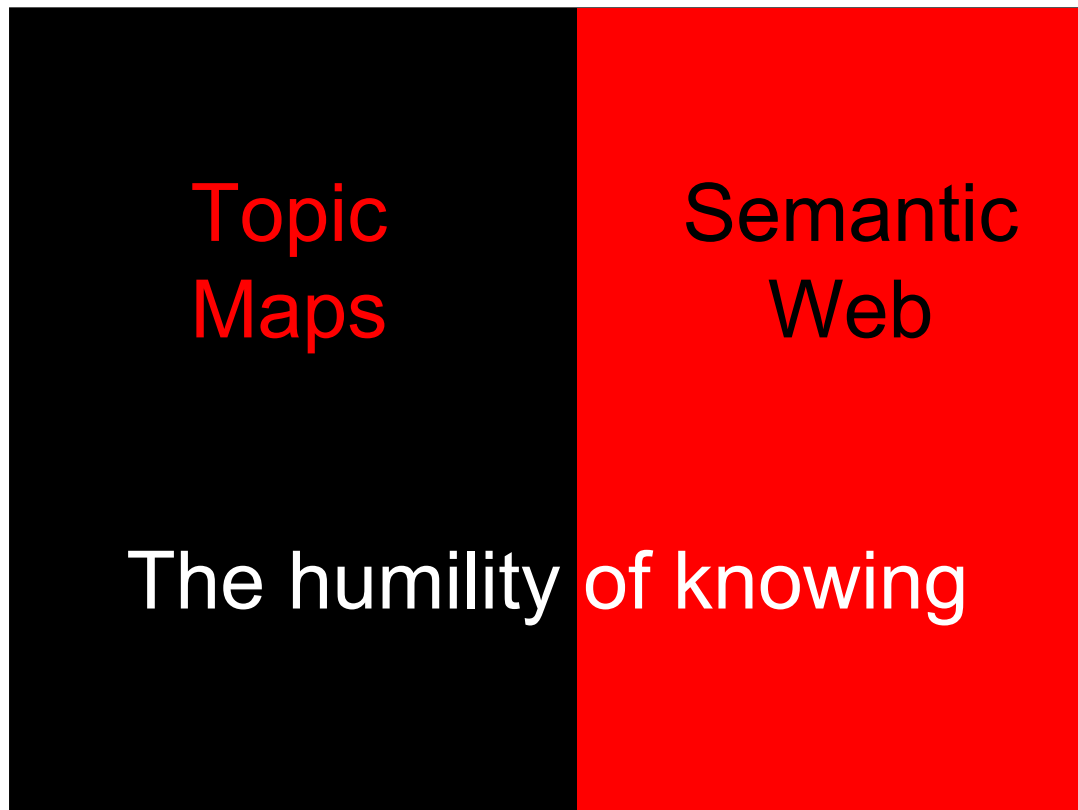
So, I can't tell you everything about my children. But here's what our relationship looks like to Facebook, when my son friended me.



This is a poor beginning. But it's just the beginning.

The solution to the information mess

(Prepare for disappointment.)



Who wins? Topic Maps are better able to represent human-understandable, fuzzy knowledge. Semantic Web presents logically actionable info. But the real winner is humility

Four Lessons



There is no one map...



1. There is no one world order

of the world. The world appears to us according to our culture and our interests. We get to choose the likenesses that lets us see the orders of our world.



2a. Language
is the best
knowledge
representation

2. What matters most is what cannot be said

What matters most is what is Complex,
unspoken, fuzzy.



There is no one world order.

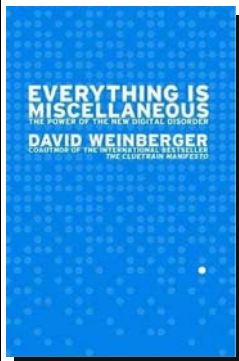


We therefore need every tool for seeing the world

4. We can only do this together

We can only do this together. This is a social task and a never ending one since it also creates our shared social world.

Thank you.



David Weinberger

Blog: www.JohoTheBlog.Com

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