Ontology Visualisation

OntoQuery - Lecture 3

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Note: for copyright reasons most of the pictures had to be removed from this on-line version of the slides.

Ben Shneiderman's Mantra for Information Visualisation:

- data types: 1-dimensional, 2-dimensional, 3-dimensional, multi-dimensional, temporal, tree, network

- tasks: overview, zoom, filter, details on demand, relate, history, extract

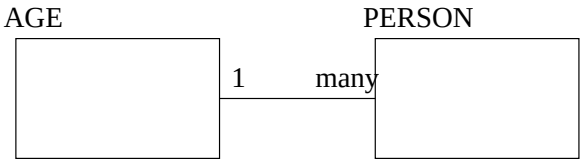
Relational databases:

types of relations influence graph structures

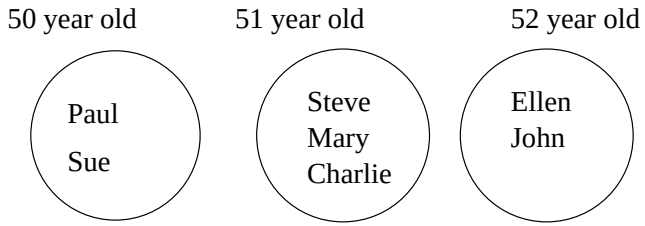
cardinality	domains	graph structures
one-to-many	different	partition, classification
one-to-many	same	directed graph, tree
many-to-many	different	bipartite graph
many-to-many	same	graph, poly-hierarchy

1) One-to-many relation with two different domains: partition or classification

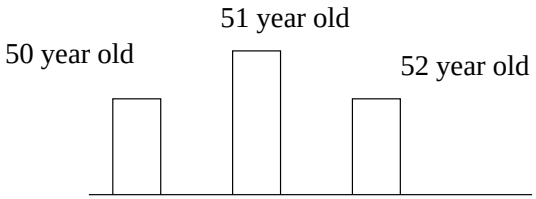
ER diagram



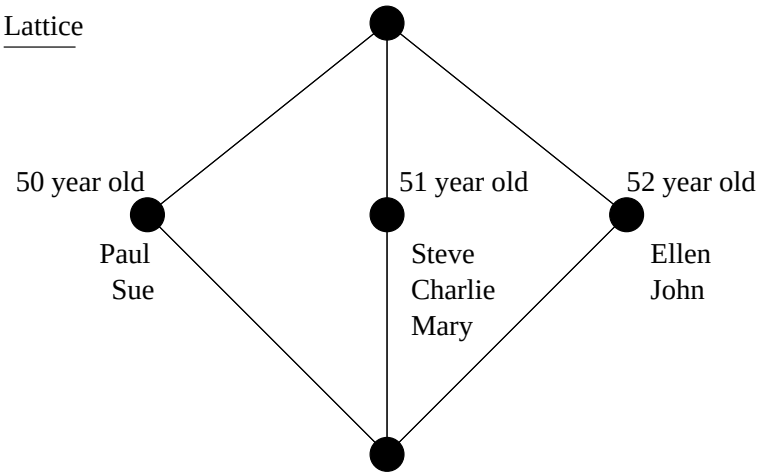
Venn diagram



Bar chart



Lattice



2) One-to-many relation with the same domains:

- directed graph (because the relation consists of tuples)
- "imperfect" tree: tree-like but has a few cross-links
  examples: Unix directory structure, Yahoo directory
- tree

Visualisations: lists, file system displays, hyperbolic trees, ...

2.1) Tree of Porphyry (Lull's version)

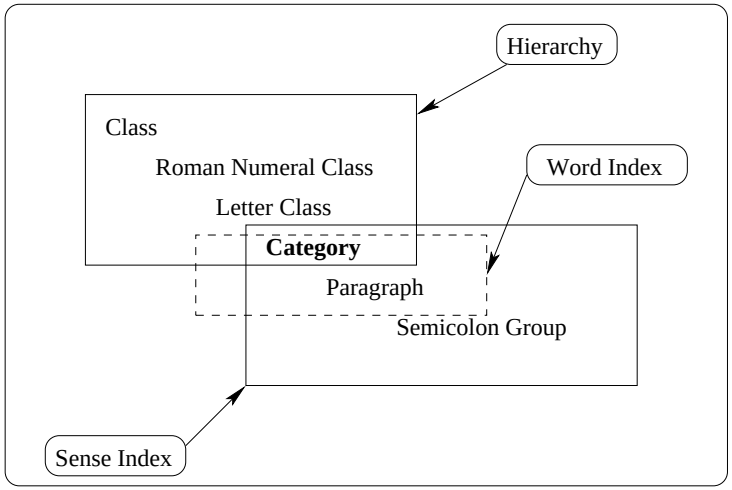
(picture removed)

2.2) Printed tree: Roget's Thesaurus

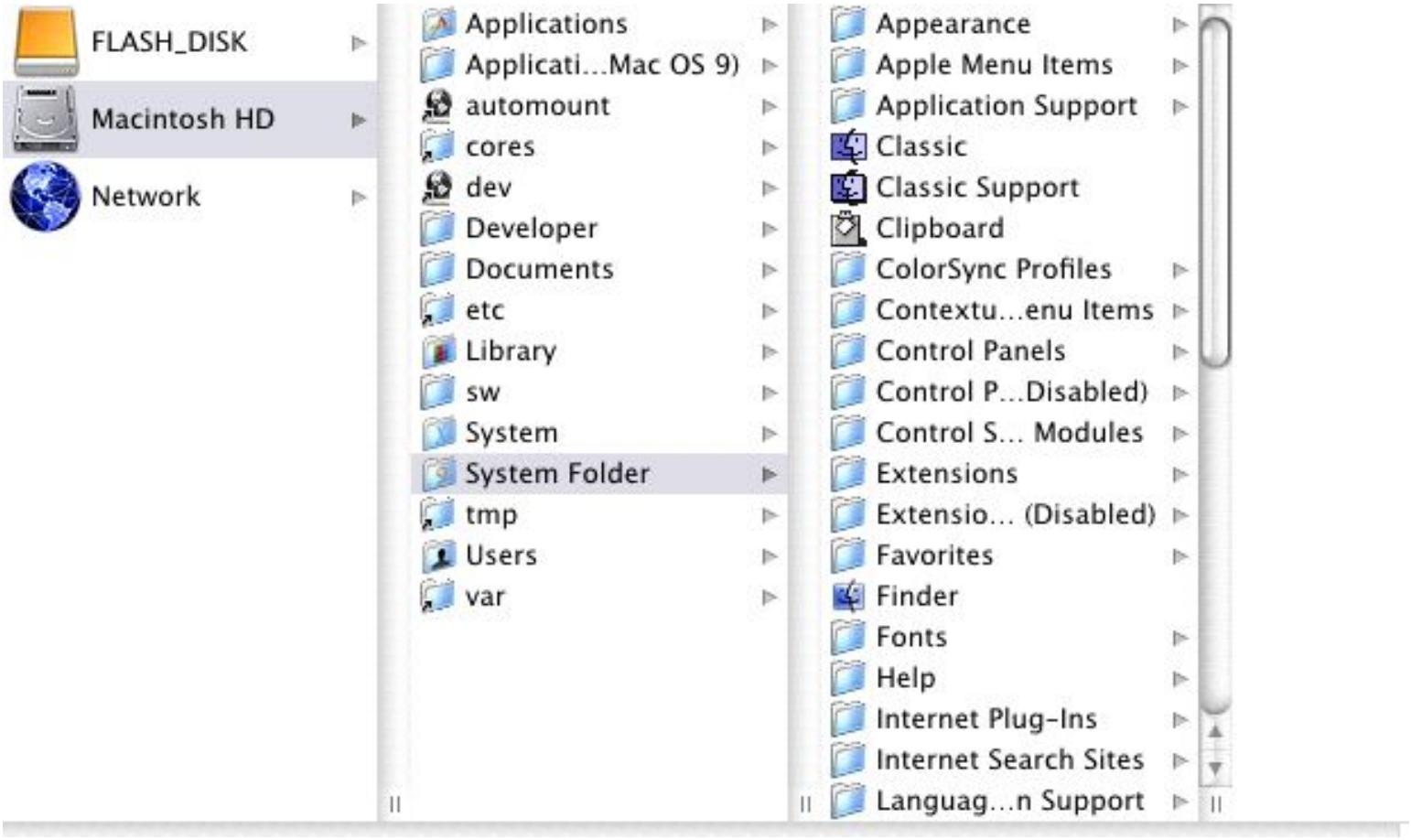
Synopsis of Categories:

CLASS ONE: ABSTRACT RELATIONS

I. EXISTENCE
A. Being in the Abstract
1. Existence
2. Nonexistence
B. Being in the Concrete
3. Substantiality
4. Unsubstantiality
34. Greatness
35. Smallness
36. Supeririority
37. Inferiority
38 Increae
39. Decrease
C. Conjunctive Quantity



2.3) File hierarchy display (MacOS):



2.4) File hierarchy display (Microsoft):

(picture removed, see
http://protege.stanford.edu/plugins/instancetree/screenshots.html)

http://protege.stanford.edu/plugins/instancetree/index.html

2.5) Hyperbolic tree:

(picture removed)

(Source: Fluit et al. (2003))

2.6) Fisheye:

(picture removed)

(Source: Mappuccino, www.cybergeography.org/atlas)

3) Many-to-many relation with two different domains:

Cross tables:

	type	type
instance	value	value
instance		value
instance	value	

Visualisations: 2-dimensional display, bipartite (clustered) graph, emerging hierarchy

3.1) 2-dimensional display: time and location

(picture removed, French train time table)

(Source: Marey (1885) according to Tufte (1983))

3.2) 2-dimensional display: multi-level information

(picture removed, Napoleon's march)

(Source: Minard (1844) according to Tufte (1983))

3.3) Bipartite Graph: Documents and topics

(picture removed)

(Source: Kartoo; http://www.cybergeography.org/atlas/)

3.4) Emerging Hierarchy - Venn Diagram:

(picture removed)

(Source: Cougar; Fluit et al. (2003))

3.5) Another example of a Venn Diagram:

(picture removed)

(Source: InfoCrystal; Fluit et al. (2003))

3.6) Cluster Map

(picture removed)

(Source: Fluit et al. (2003))

Instead of Venn Diagrams and Cluster Maps:

why not use concept lattices?

3.7) Clustering

(picture removed)

(Source: MapNet; http://www.cybergeography.org/atlas/)

4) Many-to-many relation with the same domains:
graph, network or poly-hierarchy

4.1) Ramon Lull's Wheels

(picture removed)

4.2) Data structure graph (UML-, ER-like)

(picture removed)

(Source: protege.stanford.edu/plugins/ontoviz/ontoviz.html)

4.3) Conceptual Graphs

- Semantic Networks
- Mindmaps (eg. www.thebrain.com)
- Topicmaps

4.4) Spring Embedder Graphs

(picture removed)

(Source: TouchGraph; www.cybergeography.org/atlas)

4.5) TGVizTab

TGVizTab is a plugin for Protege which allows visualizing ontologies using TouchGraph

http://www.ecs.soton.ac.uk/~ha/TGVizTab/TGVizTab.htm

Similar: KAON OIModeller