

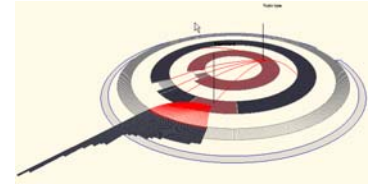
# The i-Disc

A Tool To Visualize  
and Explore Topic Maps

Tobias Hofmann

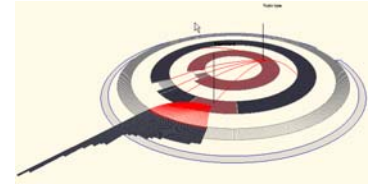
Hendrik Wendler Bernd Fröhlich

Bauhaus-Universität Weimar



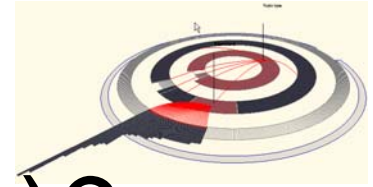
# Structure of the presentation

- Motivation
- Background on Topic Maps
- The i-Disc
- Construction, User Observation and Discussion
- Conclusion and Future Work



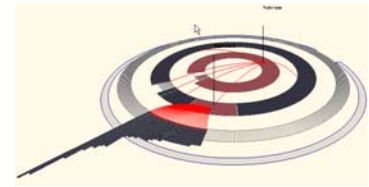
# Motivation

- E-Learning Project in the field of Media
- CS, media design, economics
- Non-linear access to course material
- Use topic maps!
- Need for interface

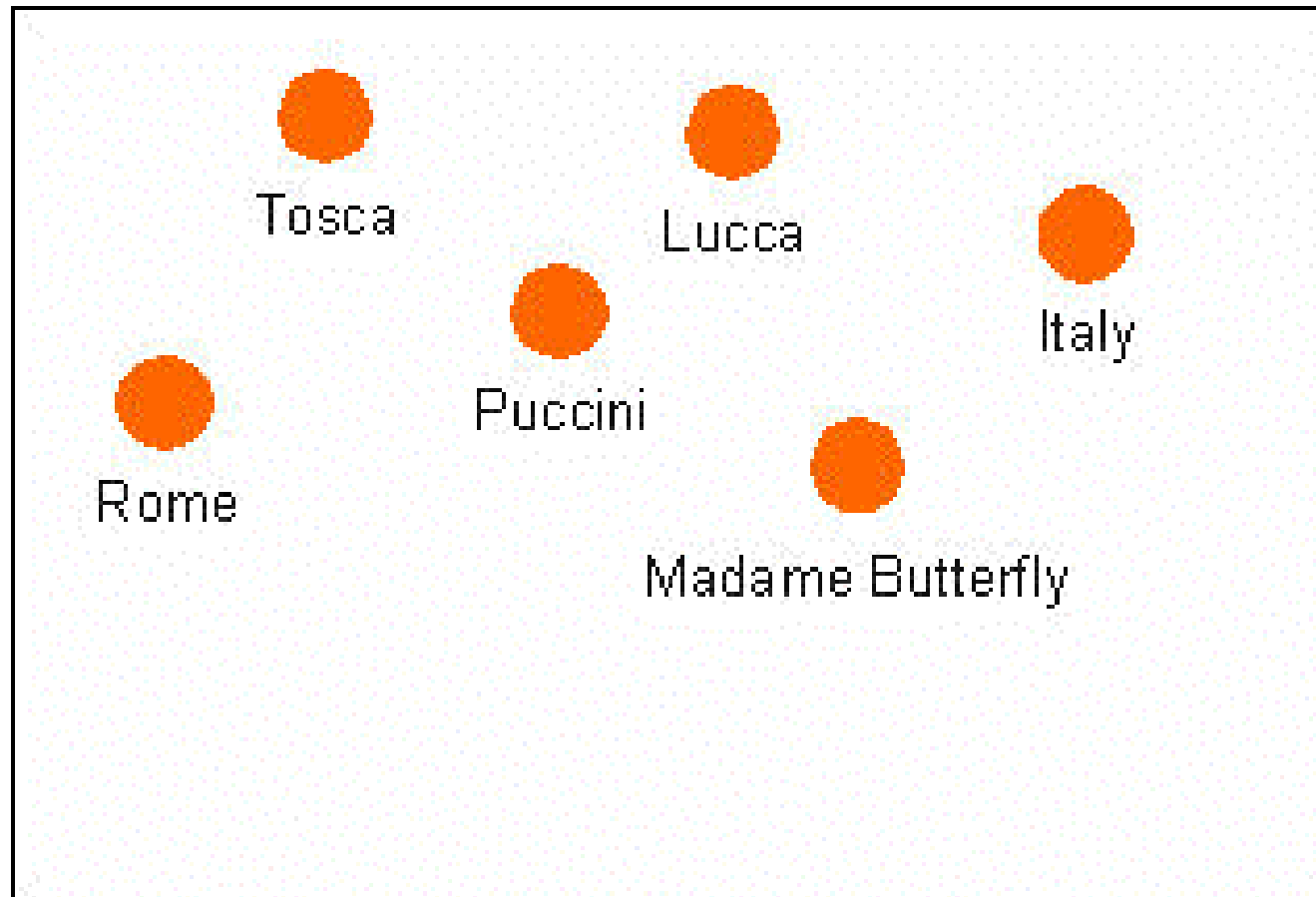


# What are topic maps (TMs)?

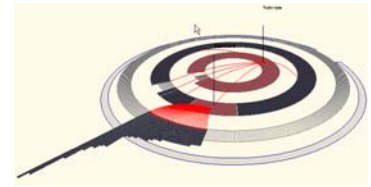
- Topic? Typing Topic?
- Association?
- Occurrence?



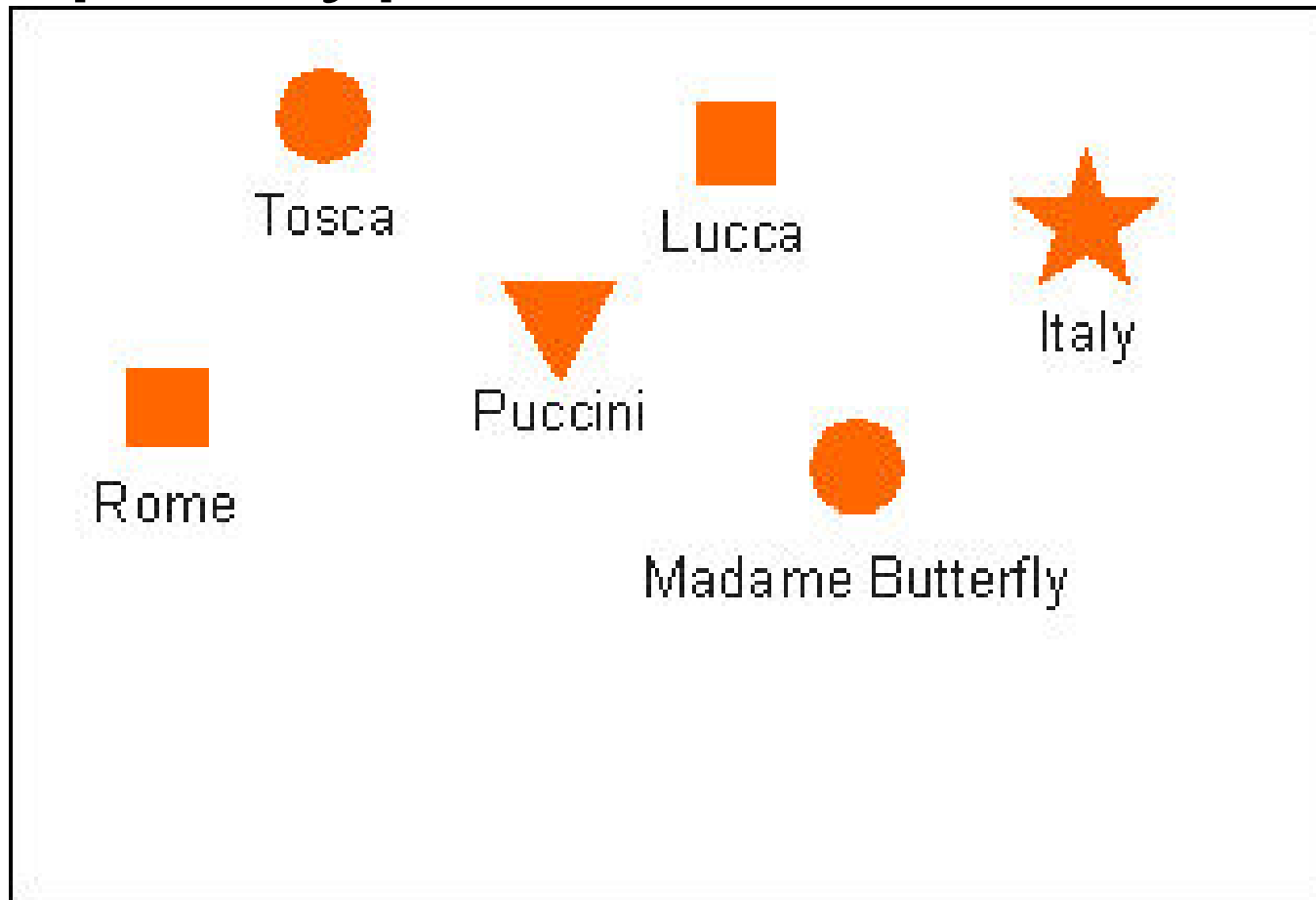
# Topics



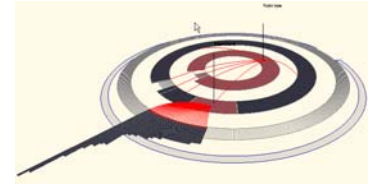
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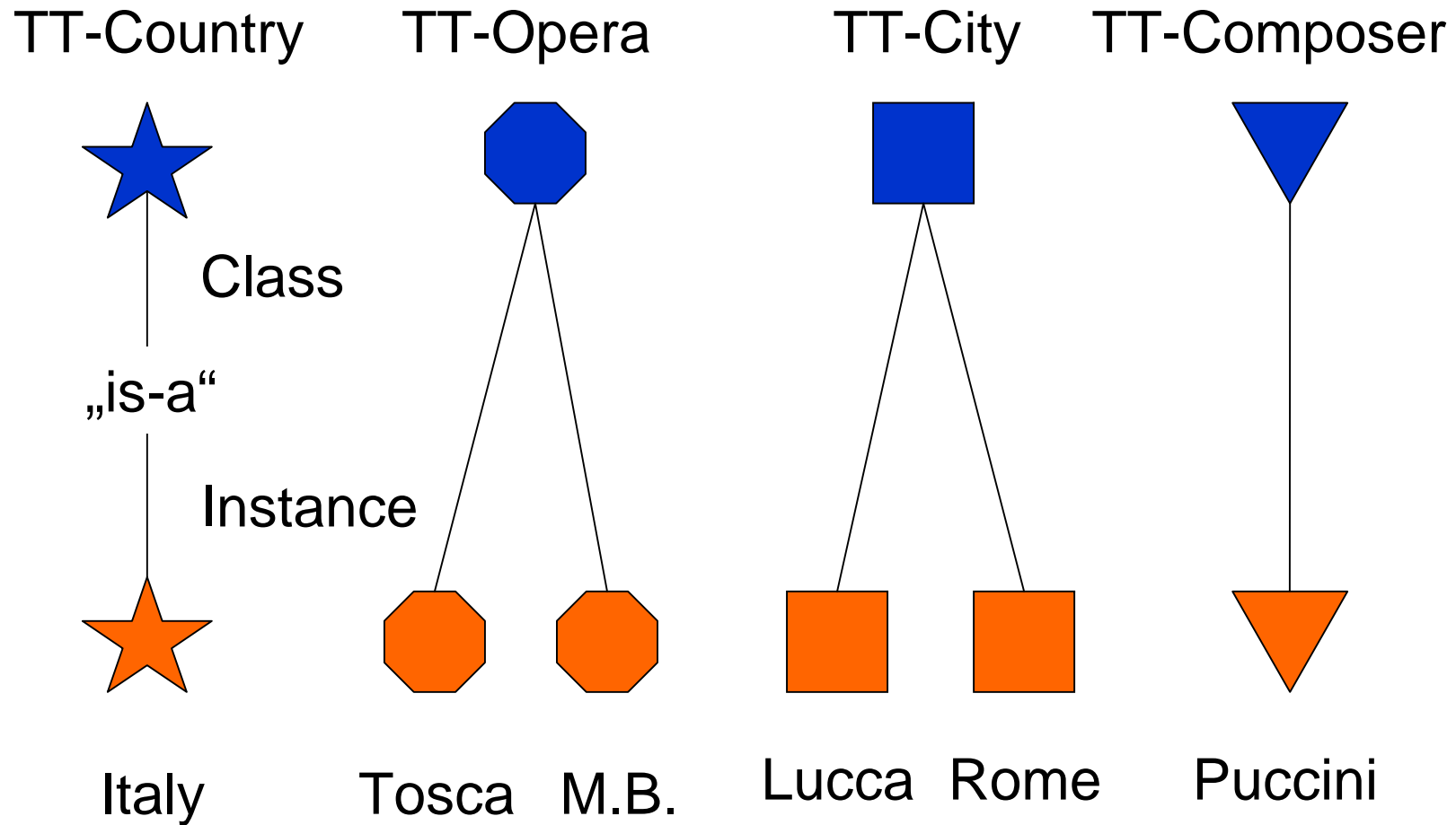
# Topic Types

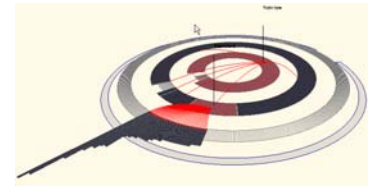


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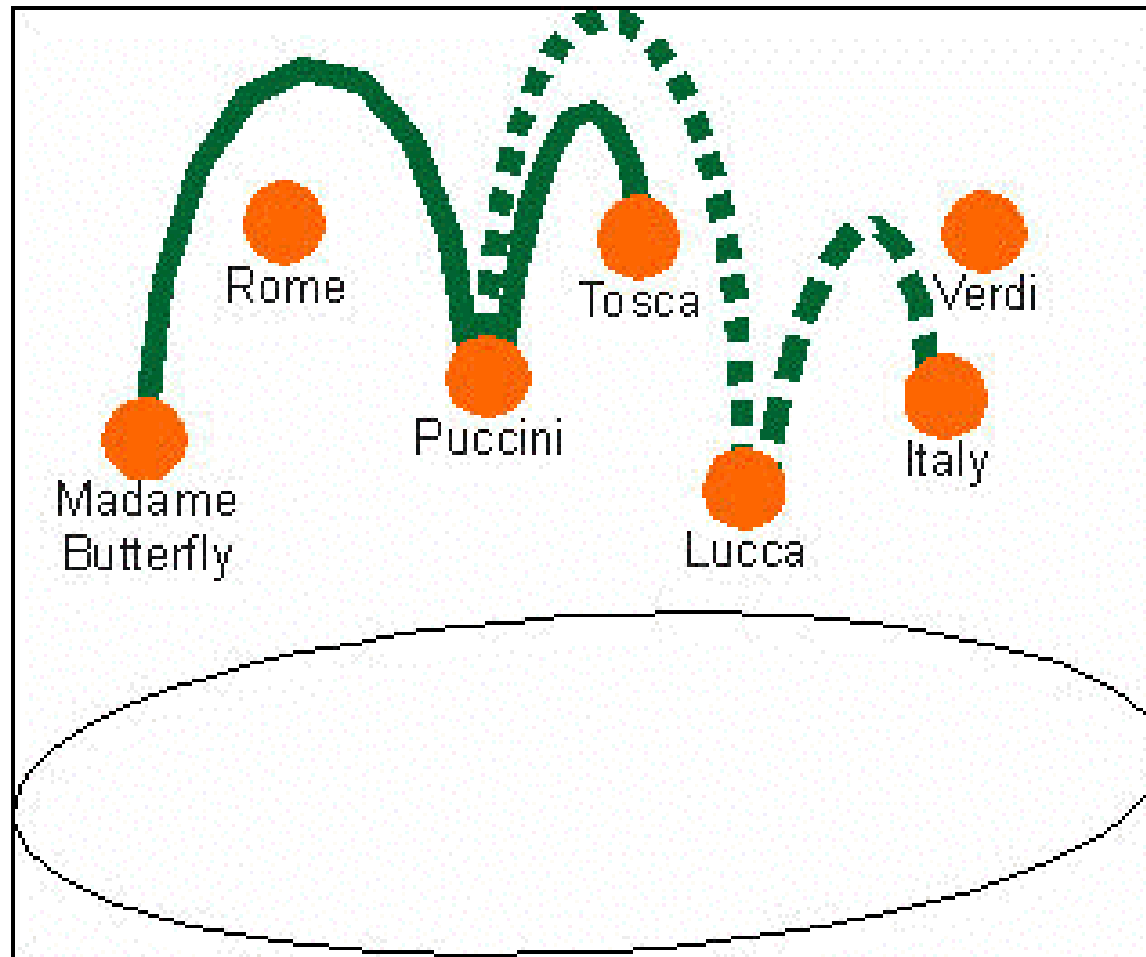


# Typing Topics – Class-Instance



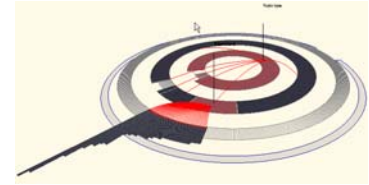


# Associations



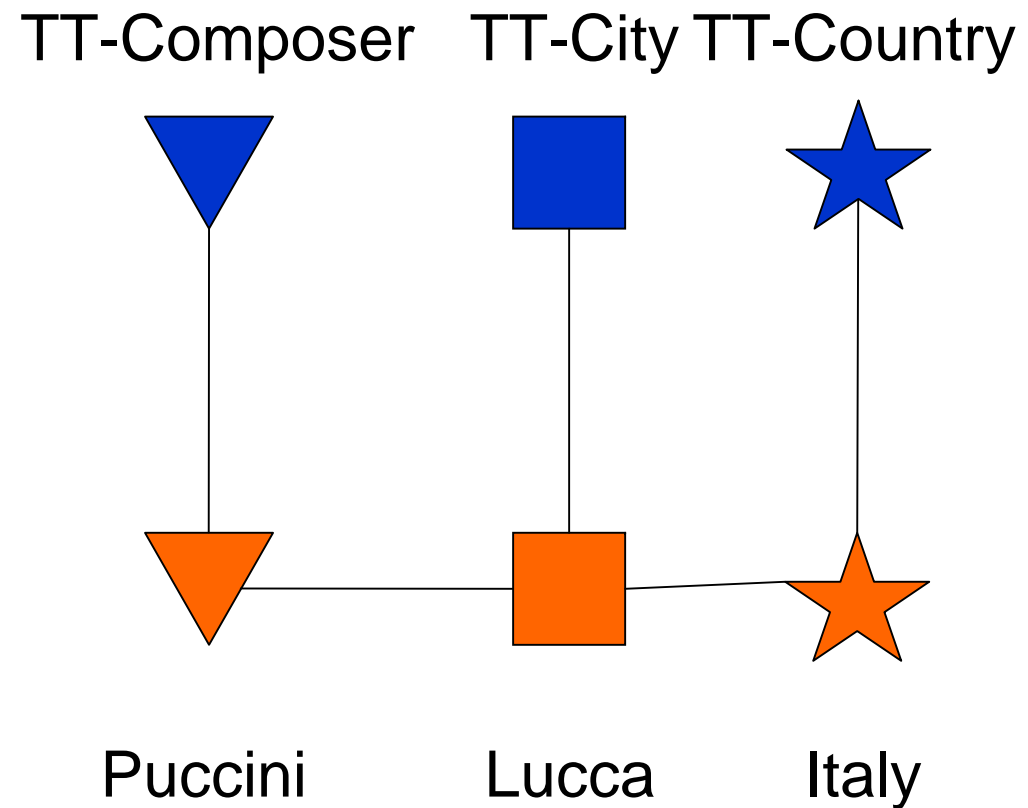
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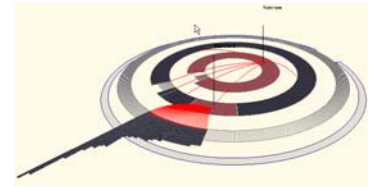




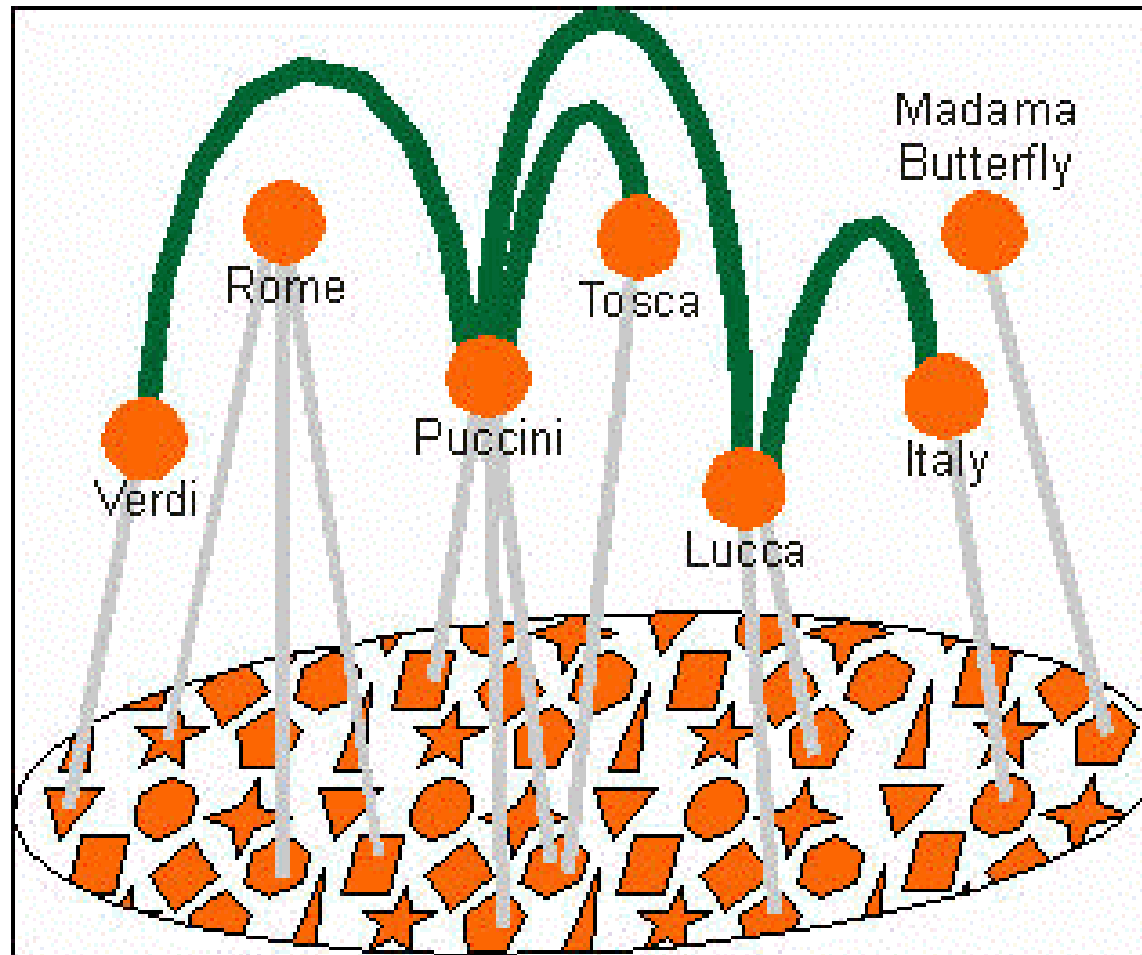
# Topics and Associations

- Classification:  
„Grouping“,  
Hierarchy
  - Class-Instance
  - Superclass-Subclass
- Class: Typing  
Topics
- Instances: Leaf  
Nodes

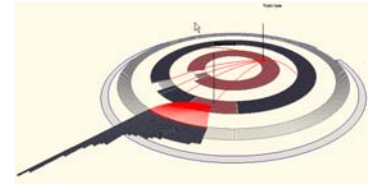




# Occurences

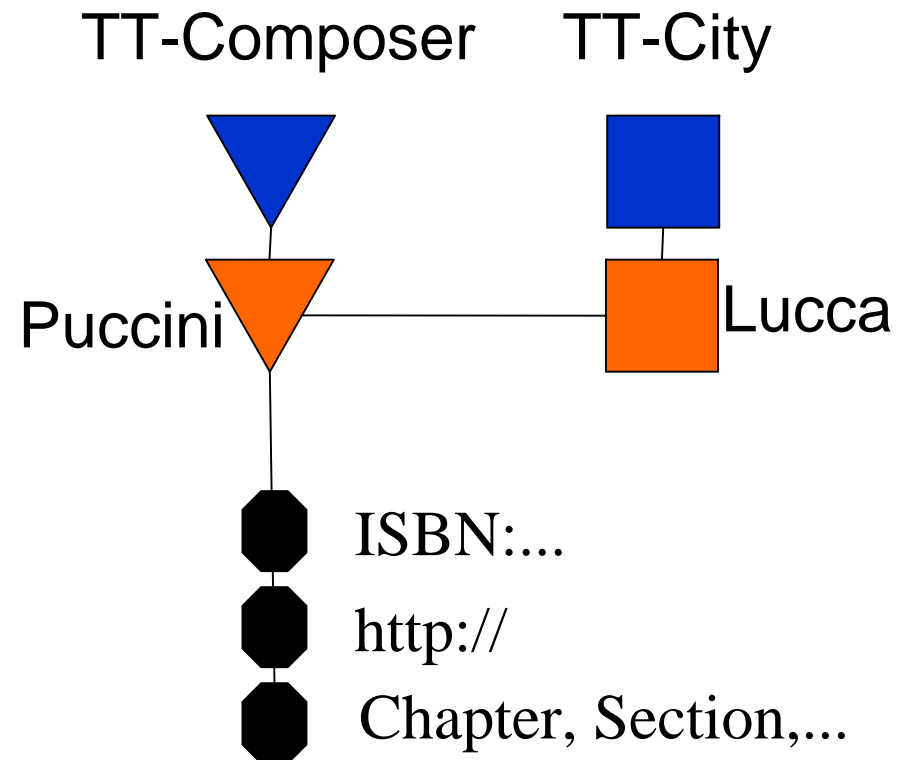


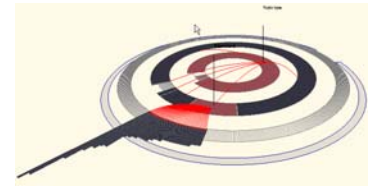
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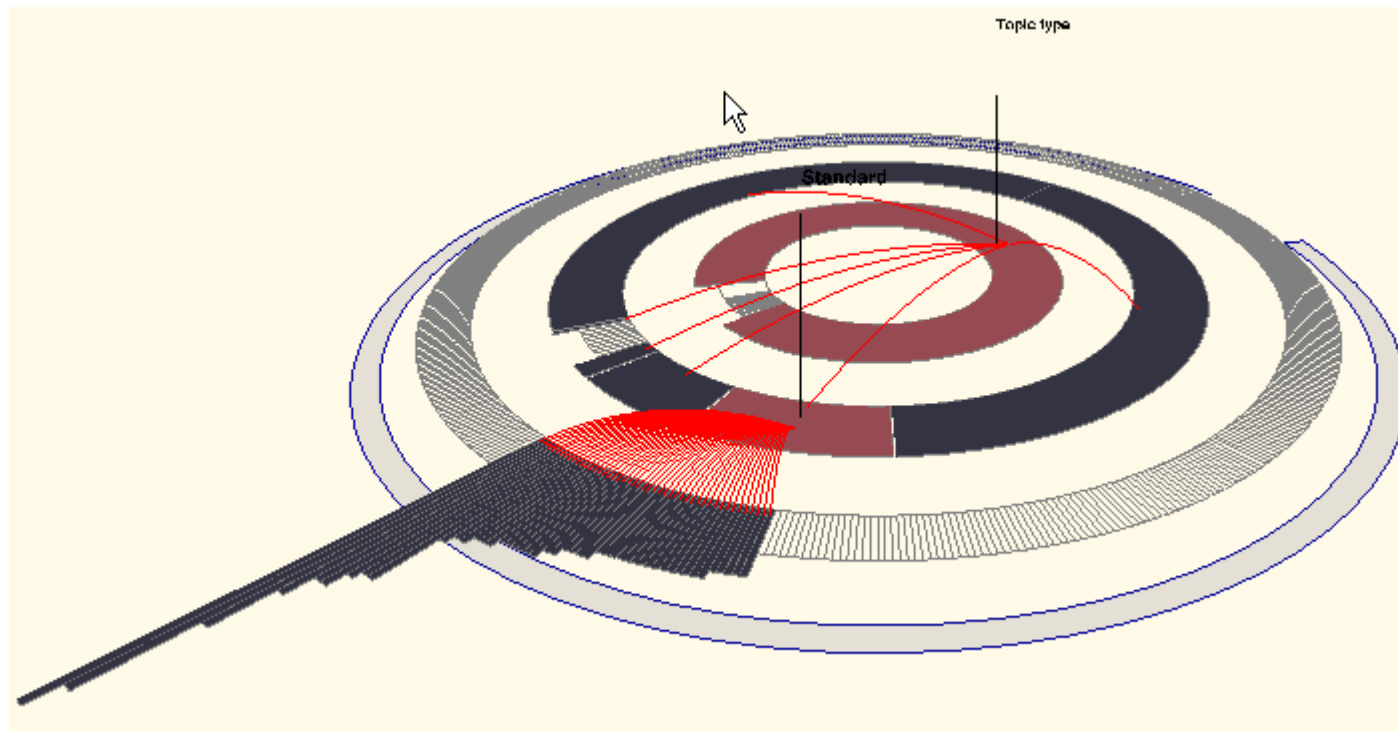
# TM Summary and Example

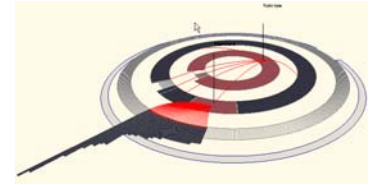
- Topological Structure
  - Node (Topic)
  - Arc (Association)
  - Pointer (Occurrence)
- Hierarchy (Class, Instance)
- (orthogonal) Associations
- Real World: Occurrence





# Live Tour

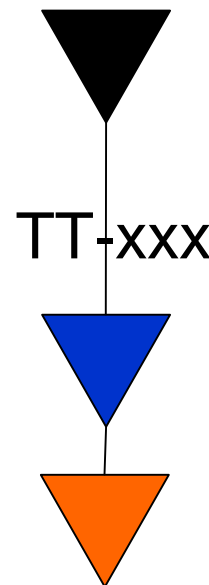




# Hierarchies

- Parse XTM-file
- Building in-memory TM
- Calculate number of hierarchies

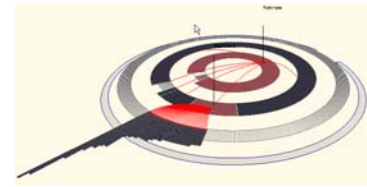
„Typing Topics“  
„Assoc. Types“  
„Occ. Roles,...“



Top  
Inner Ring

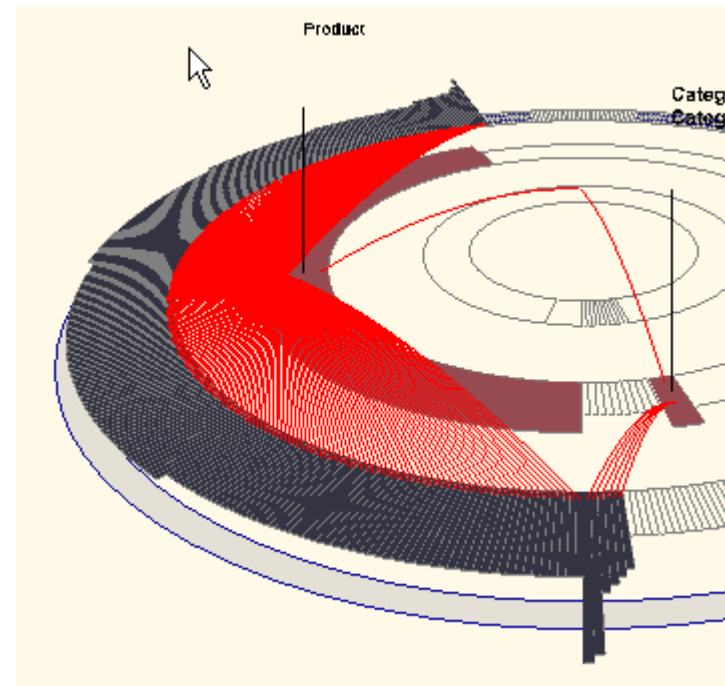
Middle Ring

Leaf Nodes  
Outer Ring

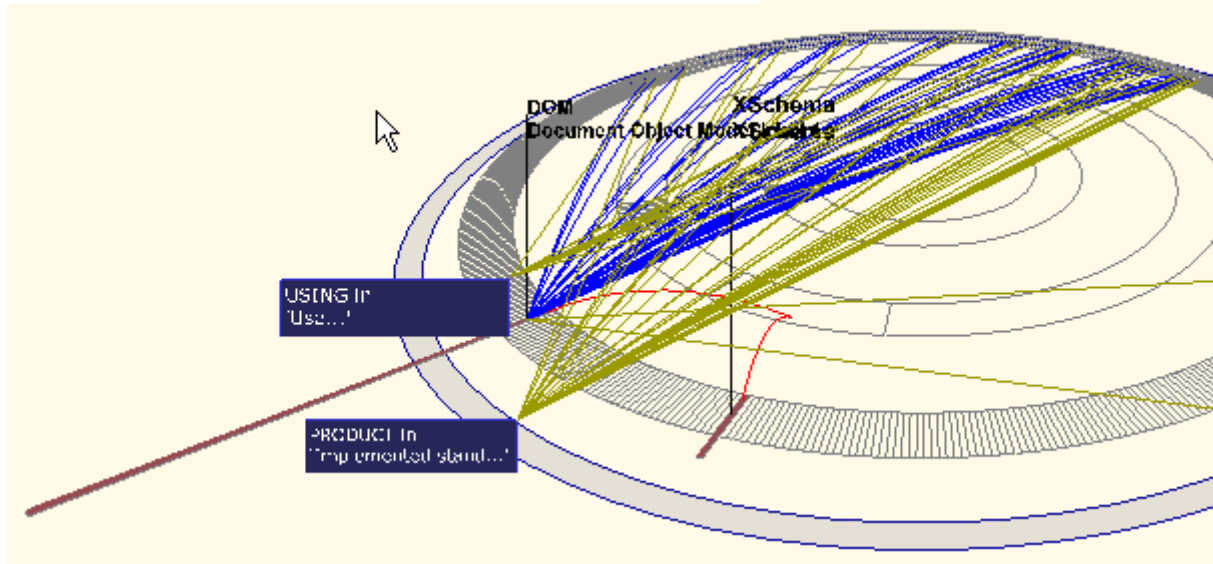
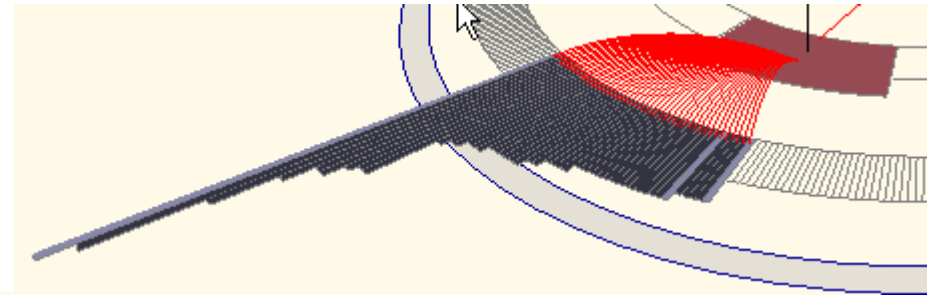
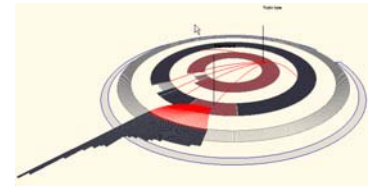


# Counting

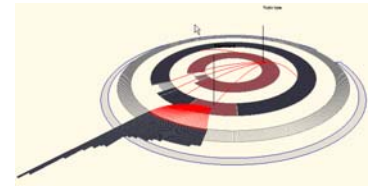
- Outer Ring:
  - Equally spaced topics on outer ring
- Middle Ring:
  - Parent  $\approx$  Children



# Sorting



# The Application



tip: go fullscreen

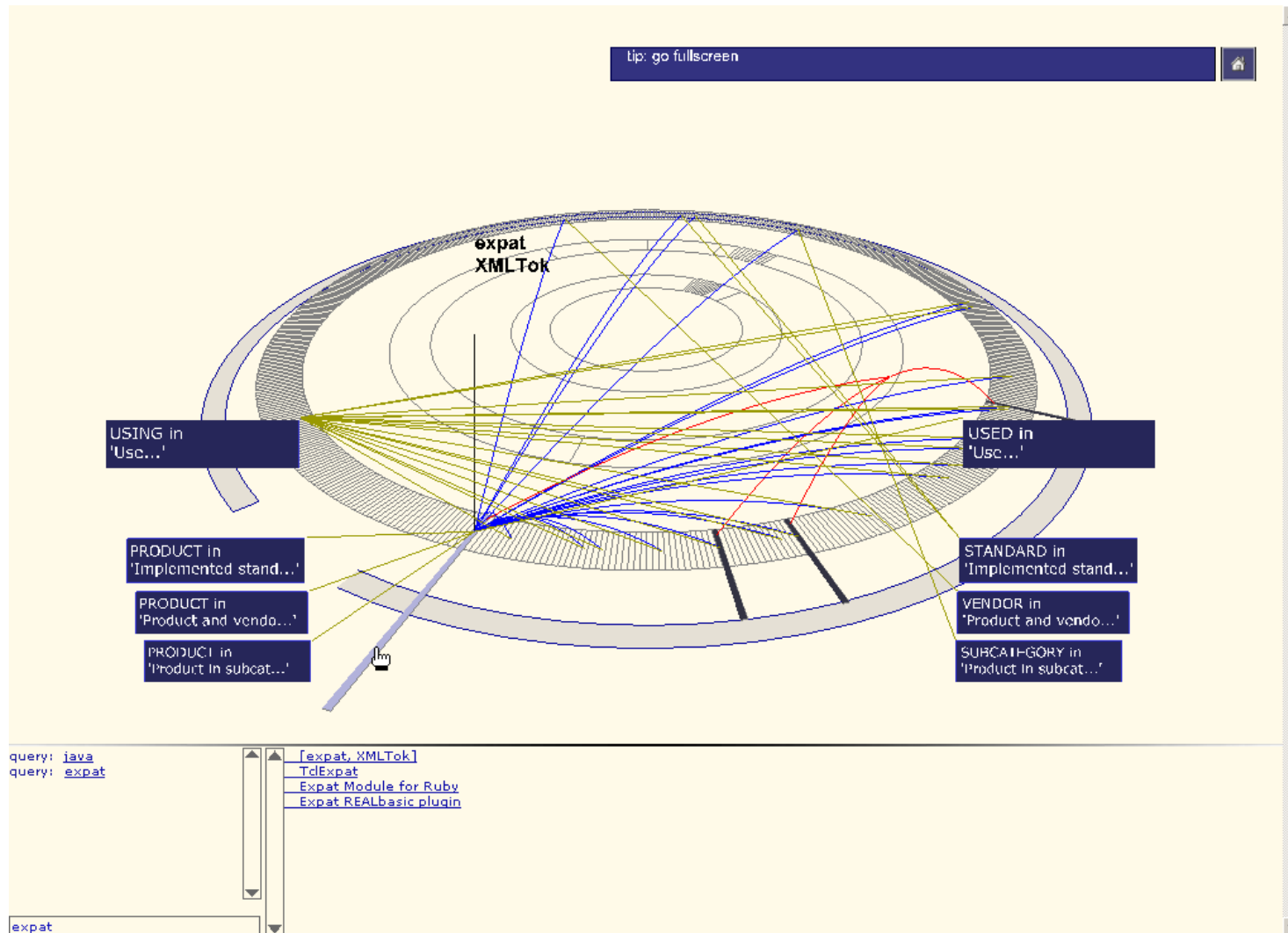
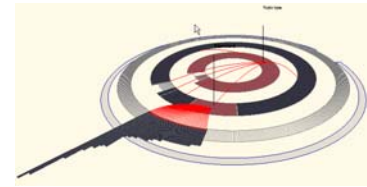
query: [java](#)  
query: [expat](#)

- [\[expat, XMLTok\]](#)
- [TdExpat](#)
- [Expat Module for Ruby](#)
- [Expat REALbasic plugin](#)

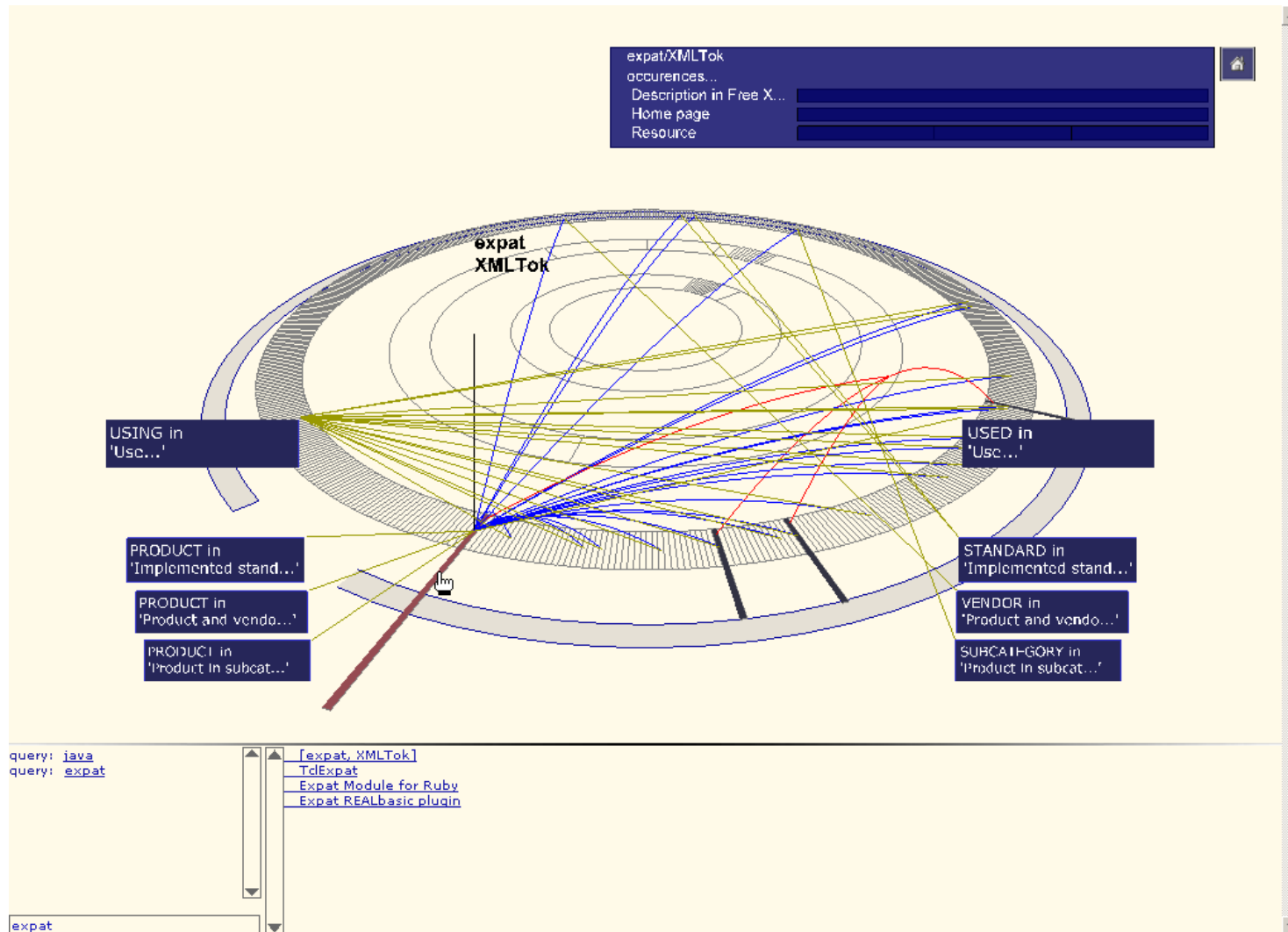
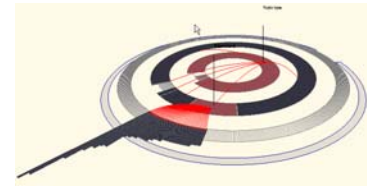
[expat](#)



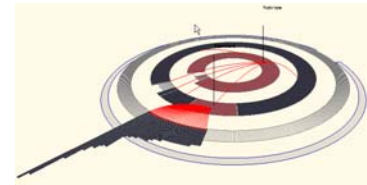
# The Application



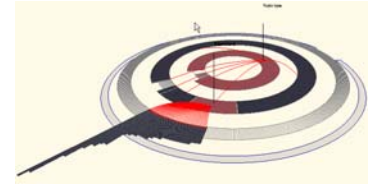
# The Application



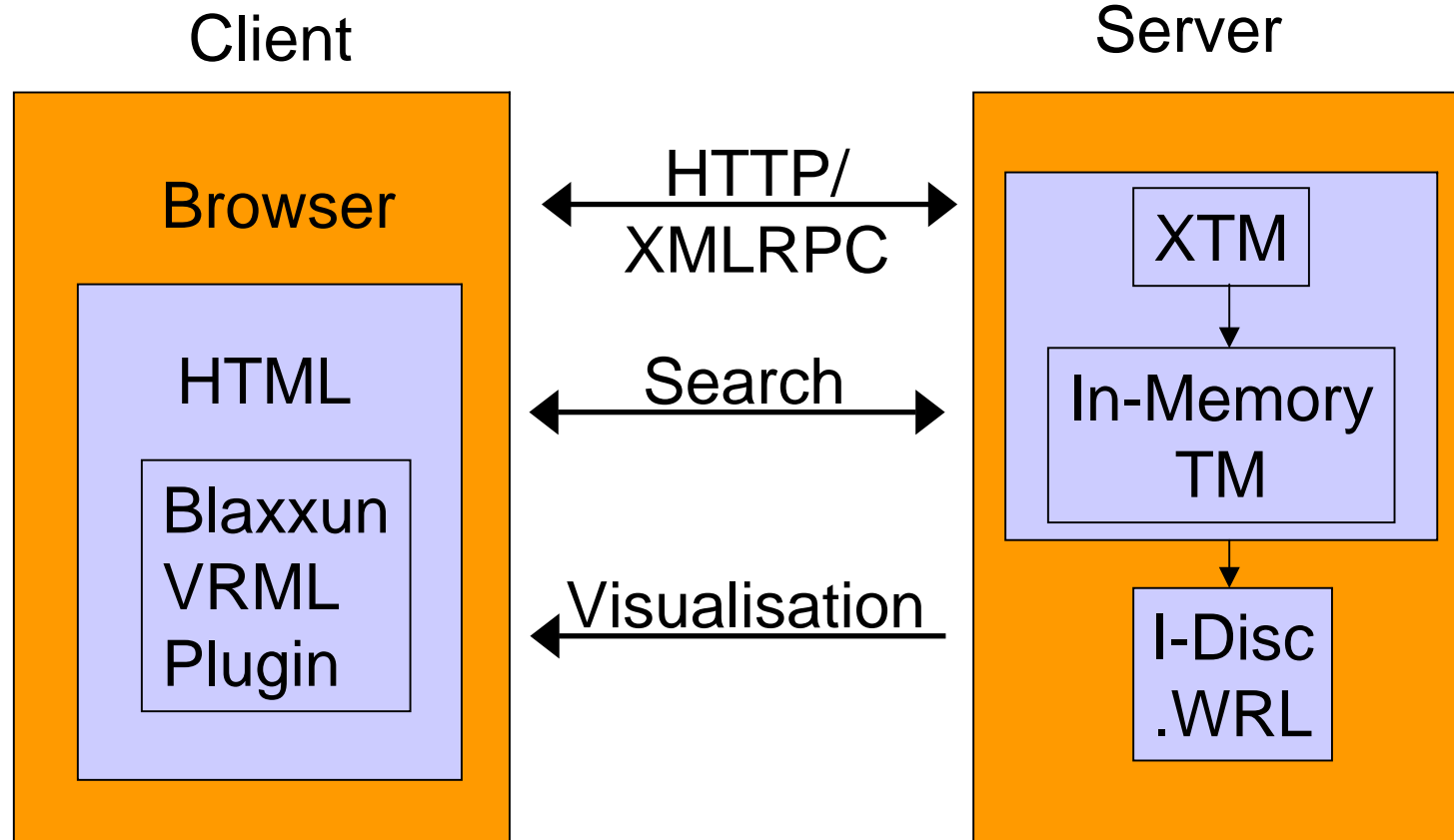
# The Application

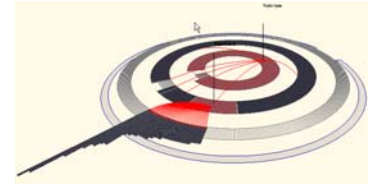


A screenshot of a Microsoft Internet Explorer browser window. The title bar reads "XML.com: Using Expat - Microsoft Internet Explorer". The address bar shows "http://www.xml.com/pub/a/1999/09/expat/". The page content includes the O'Reilly XML.com logo, a navigation menu with links like "Resources" and "Buyer's Guide", and a main article titled "Using Expat" by Clark Cooper, dated September 01, 1999. The article text describes Expat as a C library for parsing XML documents. A sidebar on the left lists various topics like "Business", "Databases", and "Programming". A large yellow advertisement in the center-right says "Serve up Safari content on your site (and make money doing it!)". The Windows taskbar at the bottom shows the Start button, several open application windows, and the system clock displaying "09:08 Sonntag".



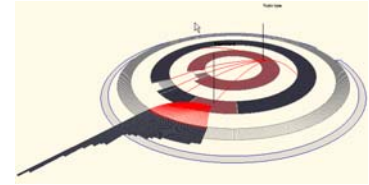
# Implementation





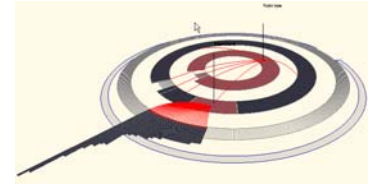
# Limitations

- „Simple“ Hypergraphs, flat hierarchy
- Tree structure by design
- Associations mainly between leaves
- Scaling: 100 - ~1000 topics, three levels



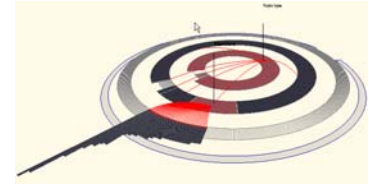
# Navigation

- Free spatial interaction
    - exhausting
  - Viewpoints from different perspectives
    - Serious loss of orientation
  - Animated transition, exploiting inertia effects
    - Enhancement, but still not convincing
- Handle for manually rotating the map



# Pilot user study

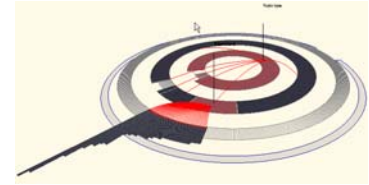
- Colleagues, staff, students (Total of 16)
- Do users accept this kind of presentation?
- Do users accept the interaction model?
- Concentric rings, rotation reported as "natural".
- Interaction with map seemed logical.



# User Observations

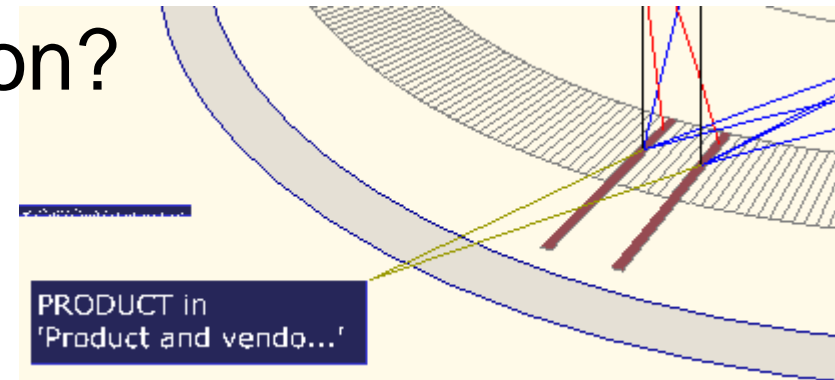
- 10 mins work
- Sketch the i-Disc
- Point at „Standard“
- → Sketch map, mention some structures.
- → Point at "standard" in their own sketch.
- → Three subdivided, structured rings
- Quick acquisition of coarse spatial layout
- **They are not aware of 600 items!**





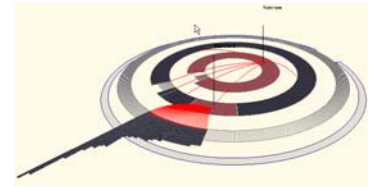
# Issues

- Connection to association labels:  
Another association?



- Occurrences not always memorized

expat/XMLTok	
occurrences...	
Description in Free X...	
Home page	
Resource	



# Economics – Brand Theory

tip: go fullscreen

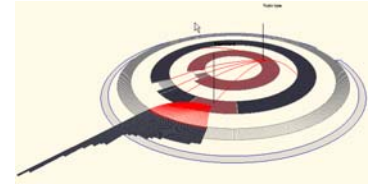
Das Problem der Beweisungsstruktur

Virtuelle Beschreibungs- und Erkennungsarten

HOWTO:  
1. go fullscreen, type in any keyword you like.  
(this map is about xmltools, so try eg. 'java', 'xml', 'perl')  
2. click the links in this window, to see your topic in the overview  
3. click the fields in the topicdescriptor (lightblue), to surf the map

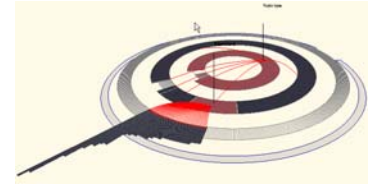
-> be sure to have the latest blaxxun vrml plugin, internet explorer 5+, medium cpu (600+)  
c' 2002 [hendrik wendler \(design/engineering\)](#)  
c' 2002 [project medien^2 / bauhaus university weimar \(project\)](#)

query keyword



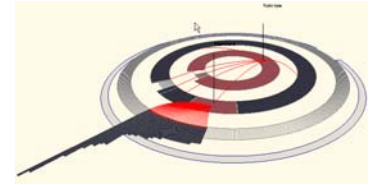
# Conclusions

- Integration into web based applications
- Elementary design: Quick perception
- Interactive exploration: Access to details on demand
- Rotation: Motion Parallax
  - Understanding of 3D structure



# Conclusions

- Perspective rendering:
    - Natural focus and context display
    - Easy to understand
  - Separation: Orth. spatial dimensions:
    - Uncluttered visual representation.
- ++ Overview of map needed at all times
- ++ Only some assoc. simultaneously



# Future Work

- ? : Reduce items displayed:
  - Use single texture
  - Display arcs on demand only.
- ? : Other domains: Graph can be separated into orthogonal structures:
  - Primary hierarchical, secondary linking
- Example: VRML-Scenegraph, orthogonal „Event Routes“ between SC nodes

# Thank you

