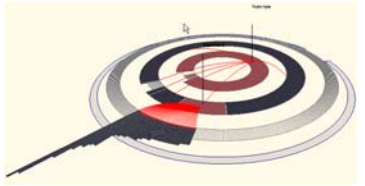


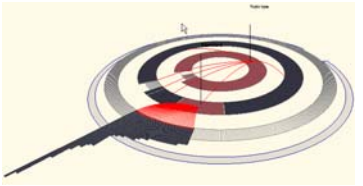
The i-Disc

A Tool To Visualize and Explore Topic Maps

Tobias Hofmann

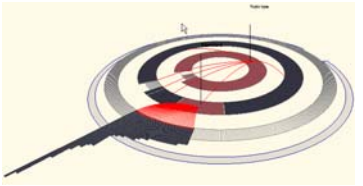
Hendrik Wendler Bernd Fröhlich

Bauhaus-Universität Weimar



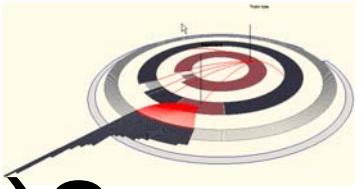
Structure of the presentation

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



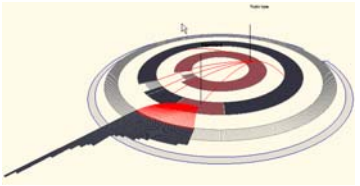
Motivation

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

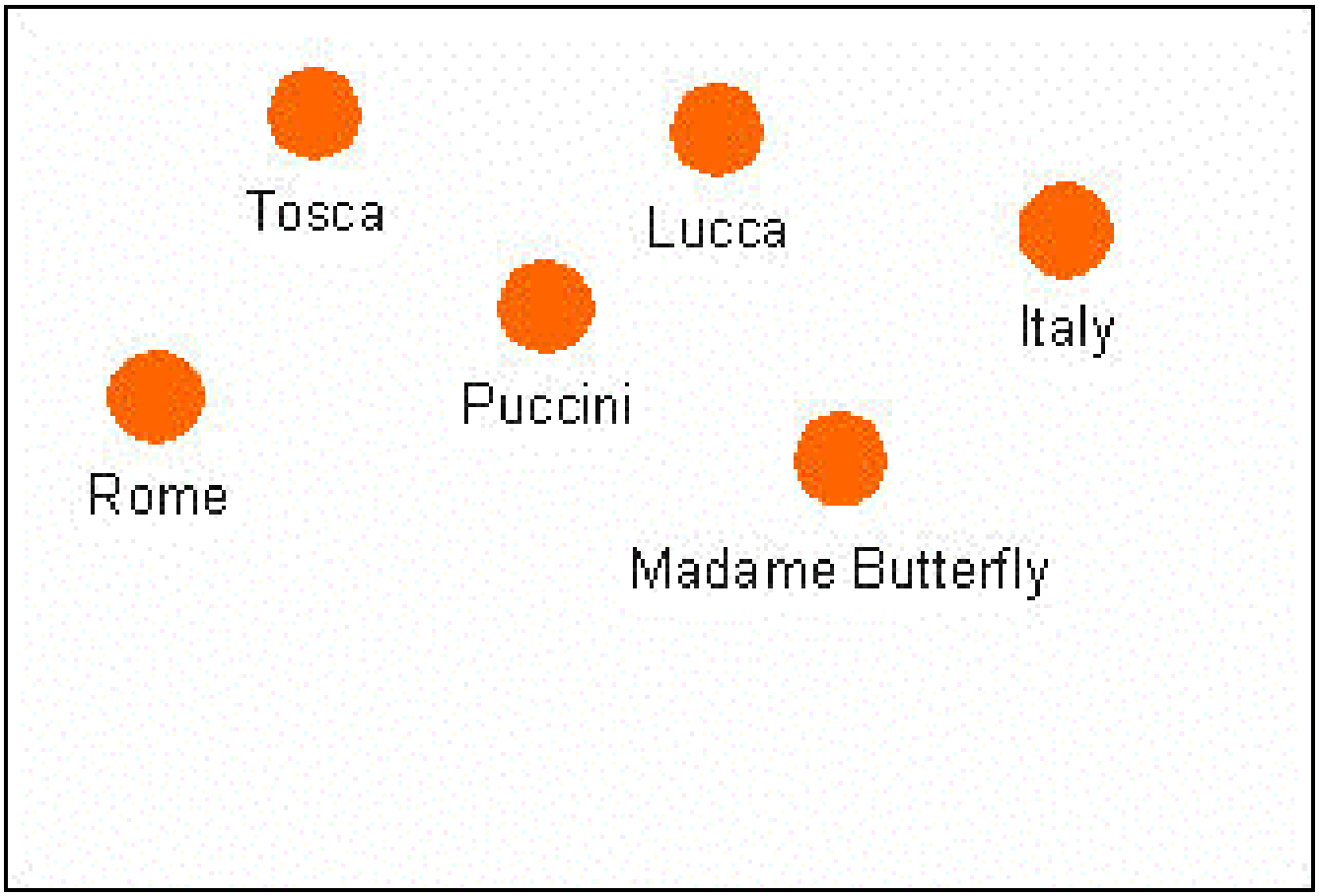


What are topic maps (TMs)?

- Topic? Typing Topic?
- Association?
- Occurence?



Topics



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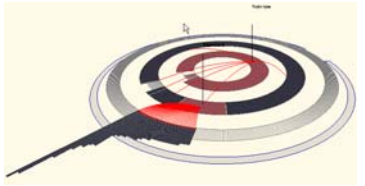
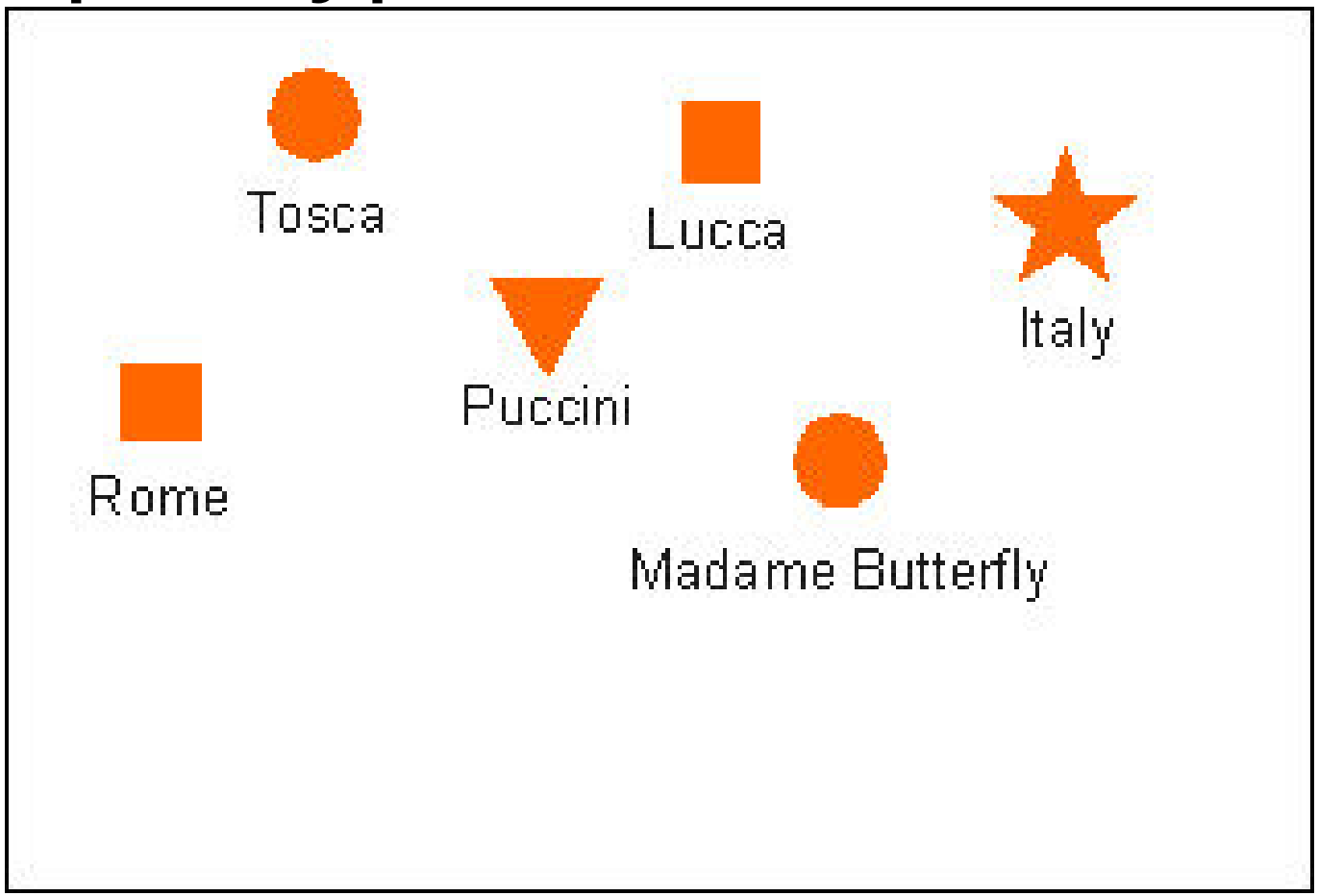


Topic Types



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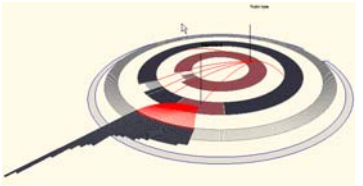
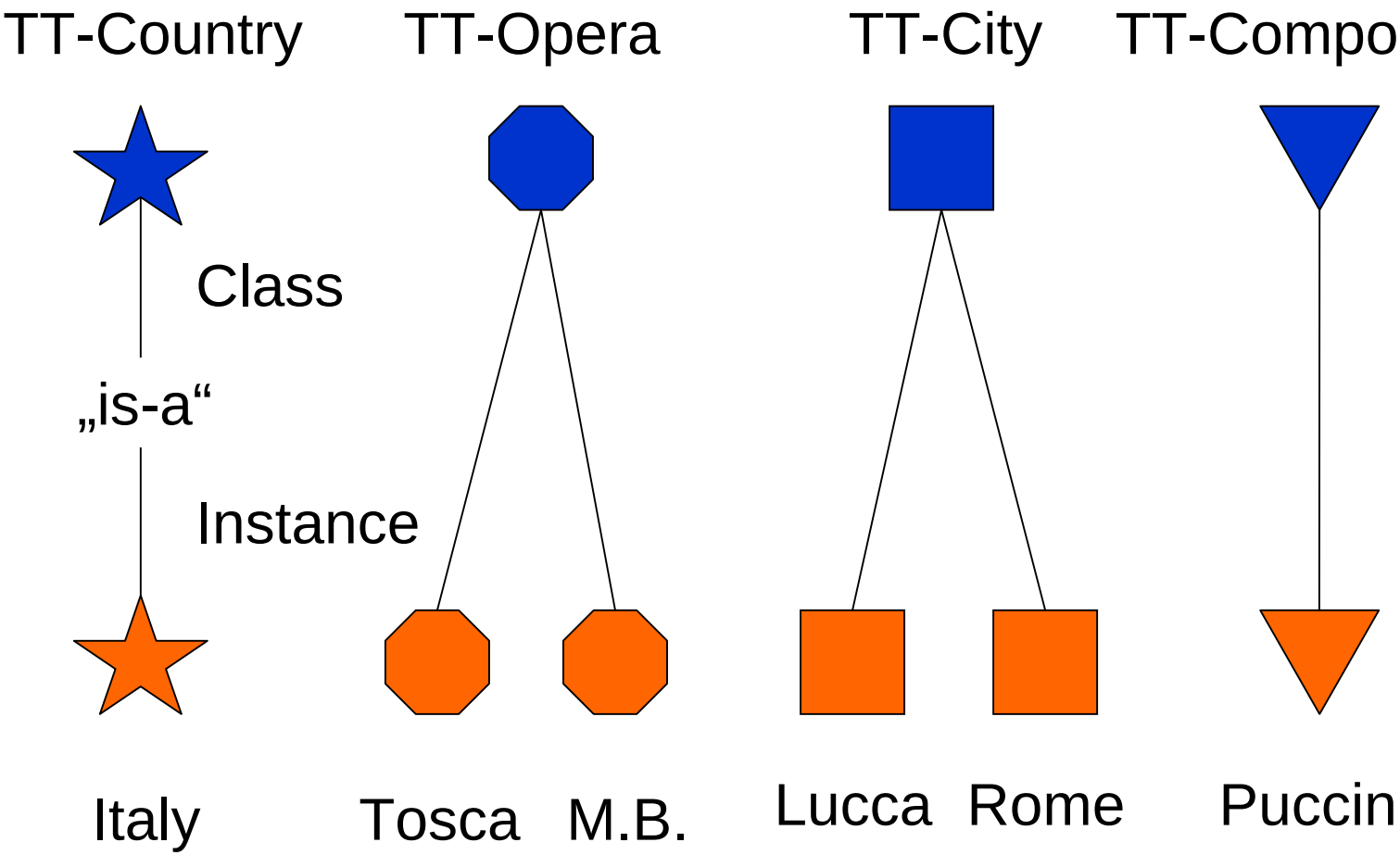
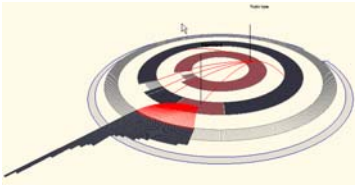
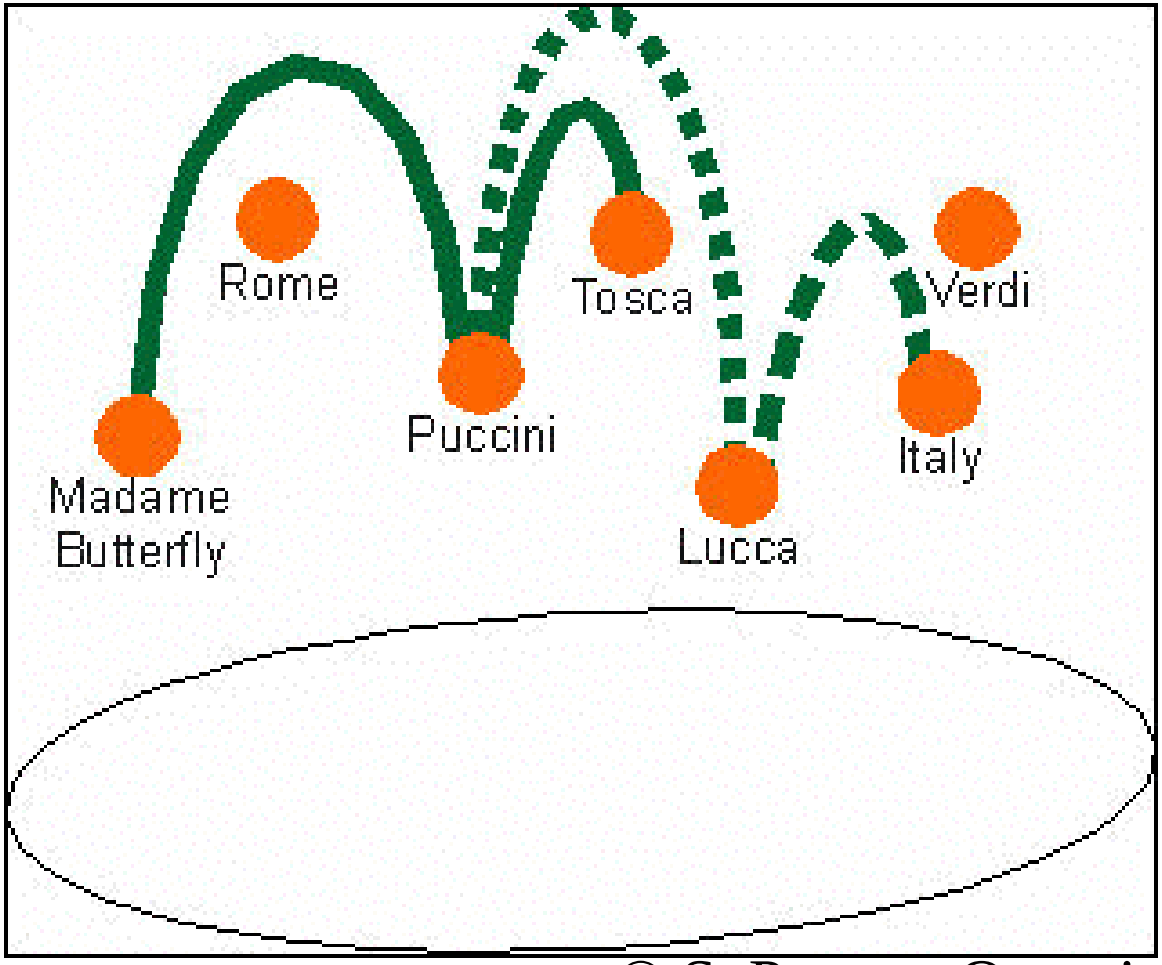


Typing Topics – Class-Instance





Associations



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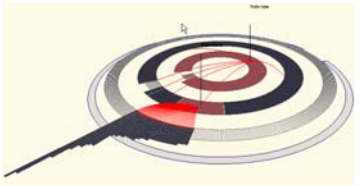
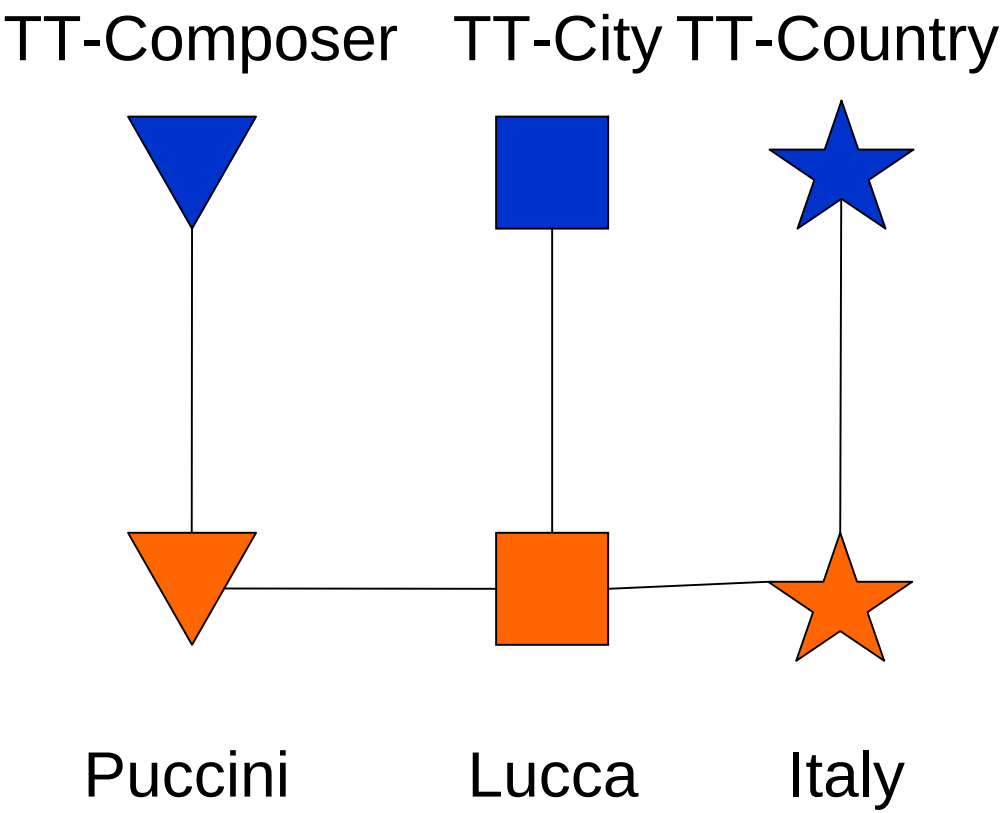
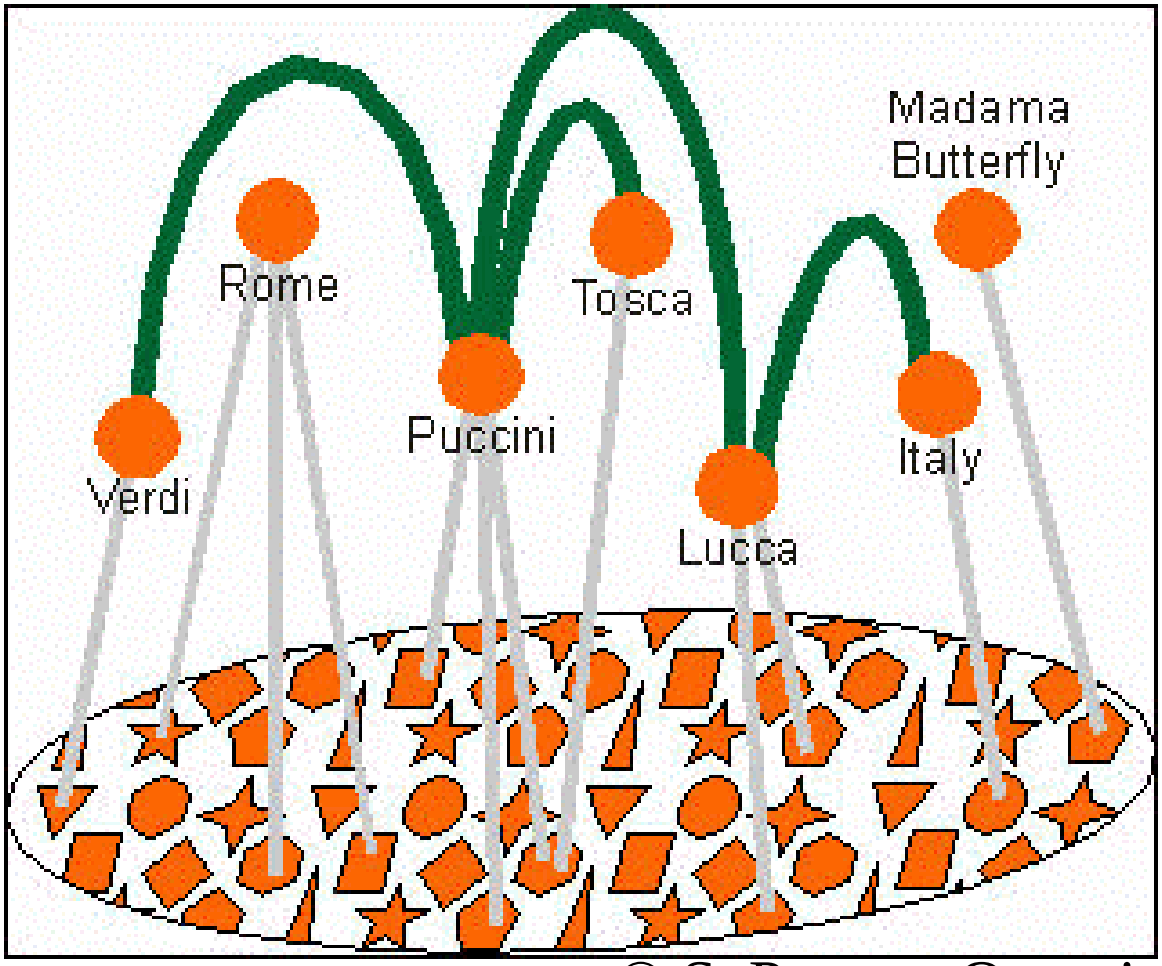


Topics and Associations

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



Occurences



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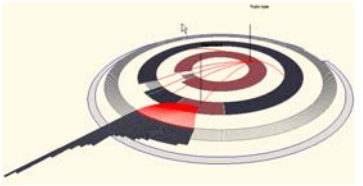
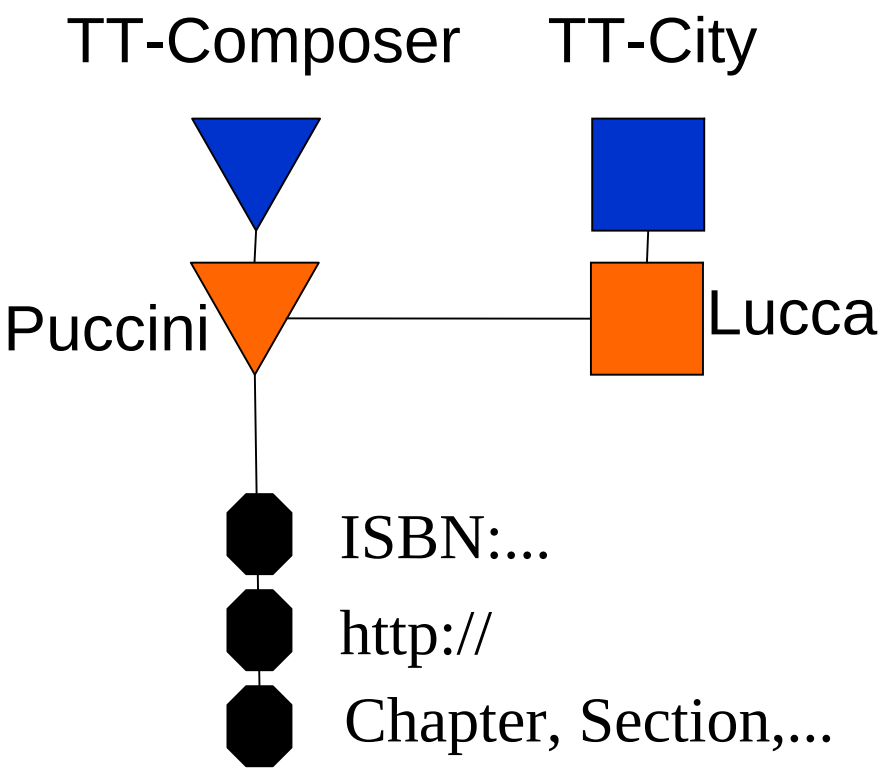
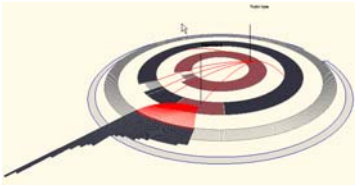


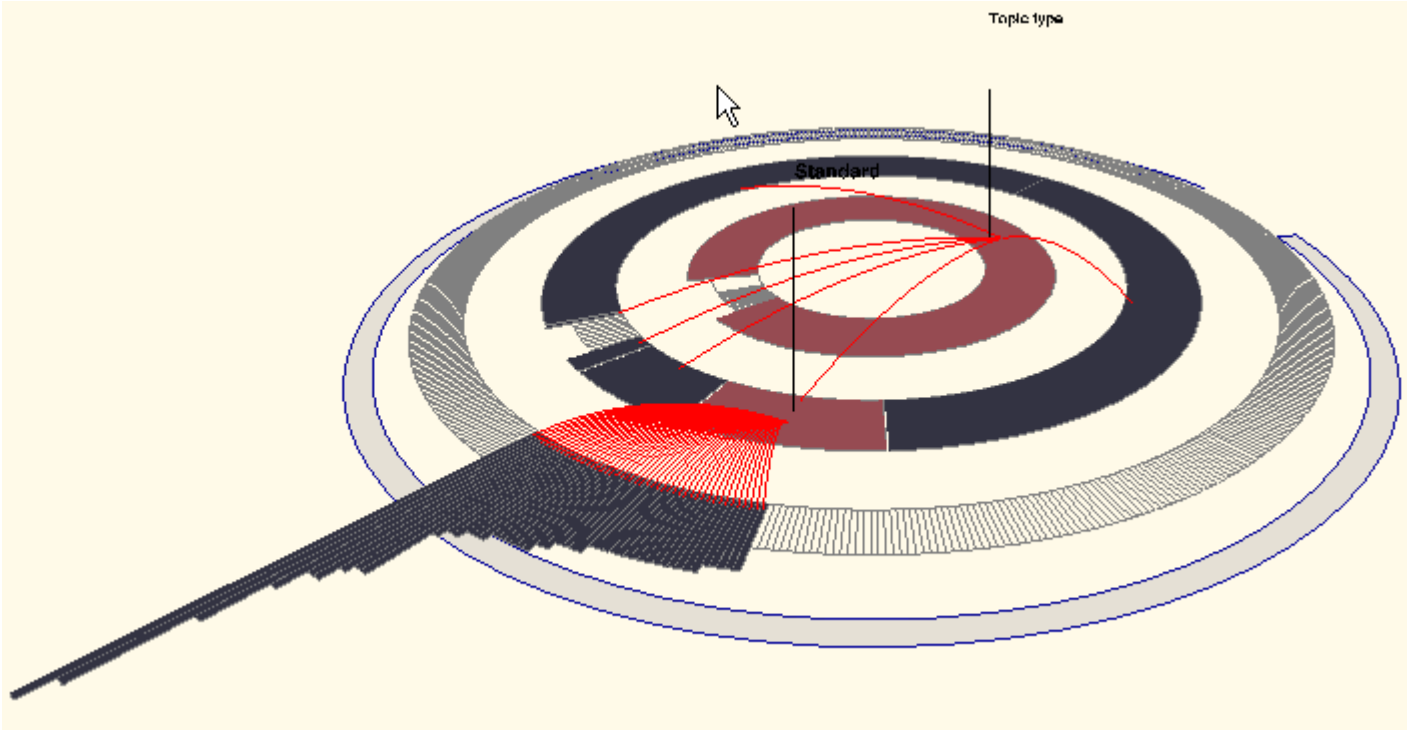
TM Summary and Example

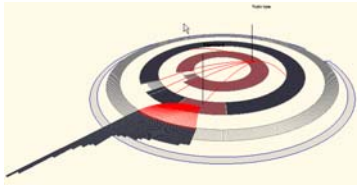
- Topological Structure
  - Node (Topic)
  - Arc (Association)
  - Pointer (Occurence)
- Hierarchy (Class, Instance)
- (orthogonal) Associations
- Real World: Occurence





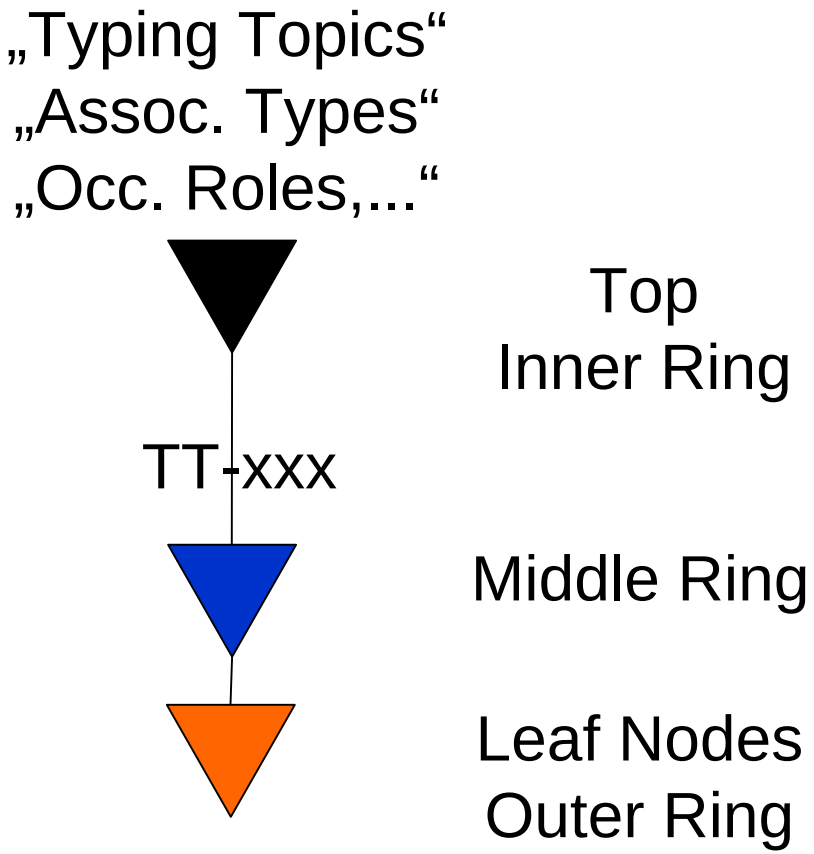
Live Tour

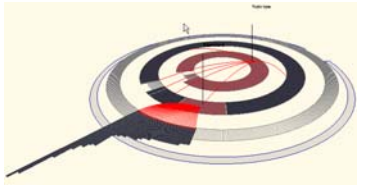




Hierarchies

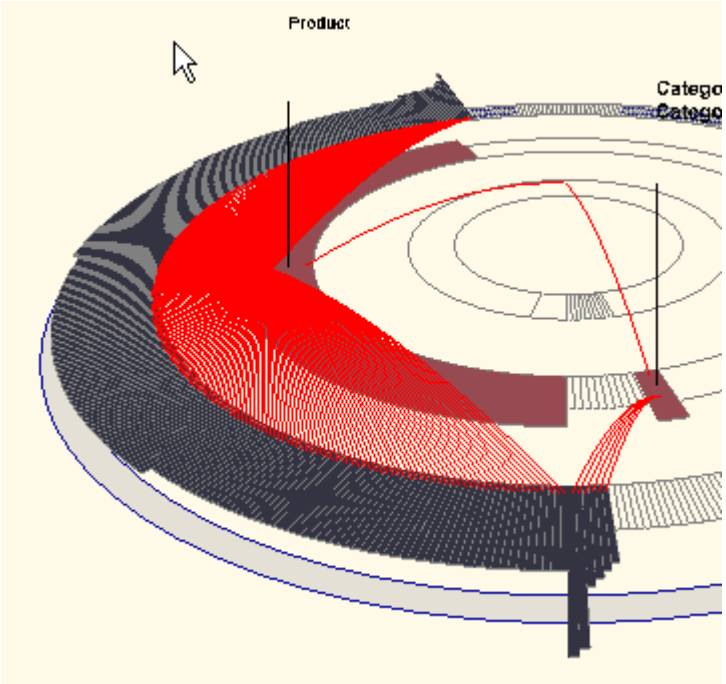
- Parse XTM-file
- Building in-memory TM
- Calculate number of hierarchies

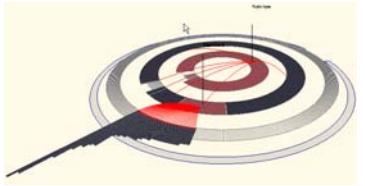




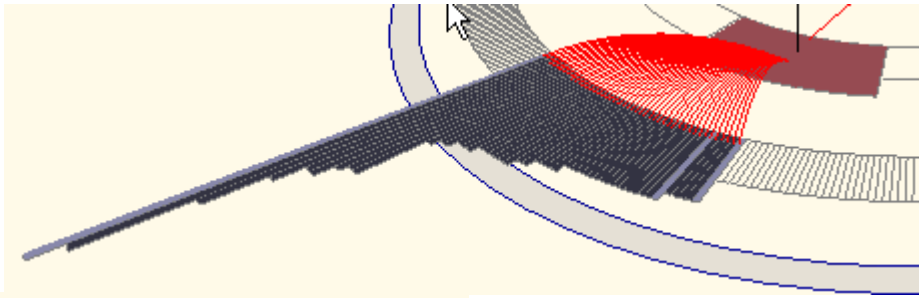
Counting

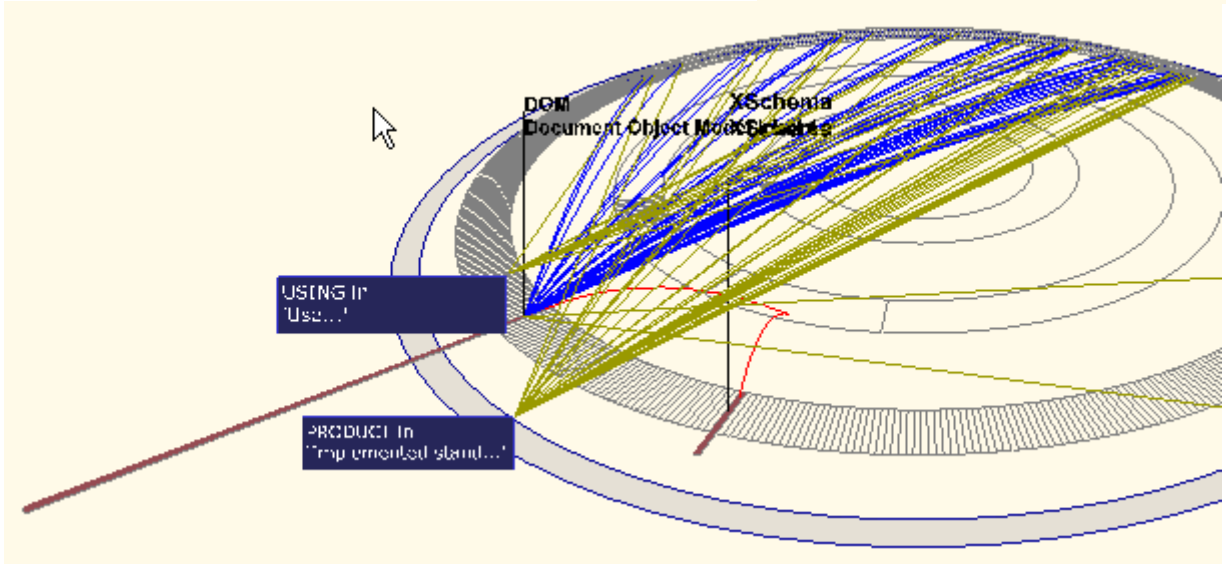
- Outer Ring:
  - Equally spaced topics on outer ring
- Middle Ring:
  - Parent ~= Children



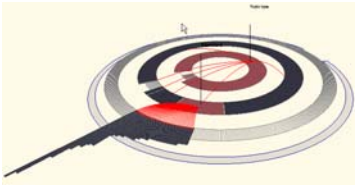


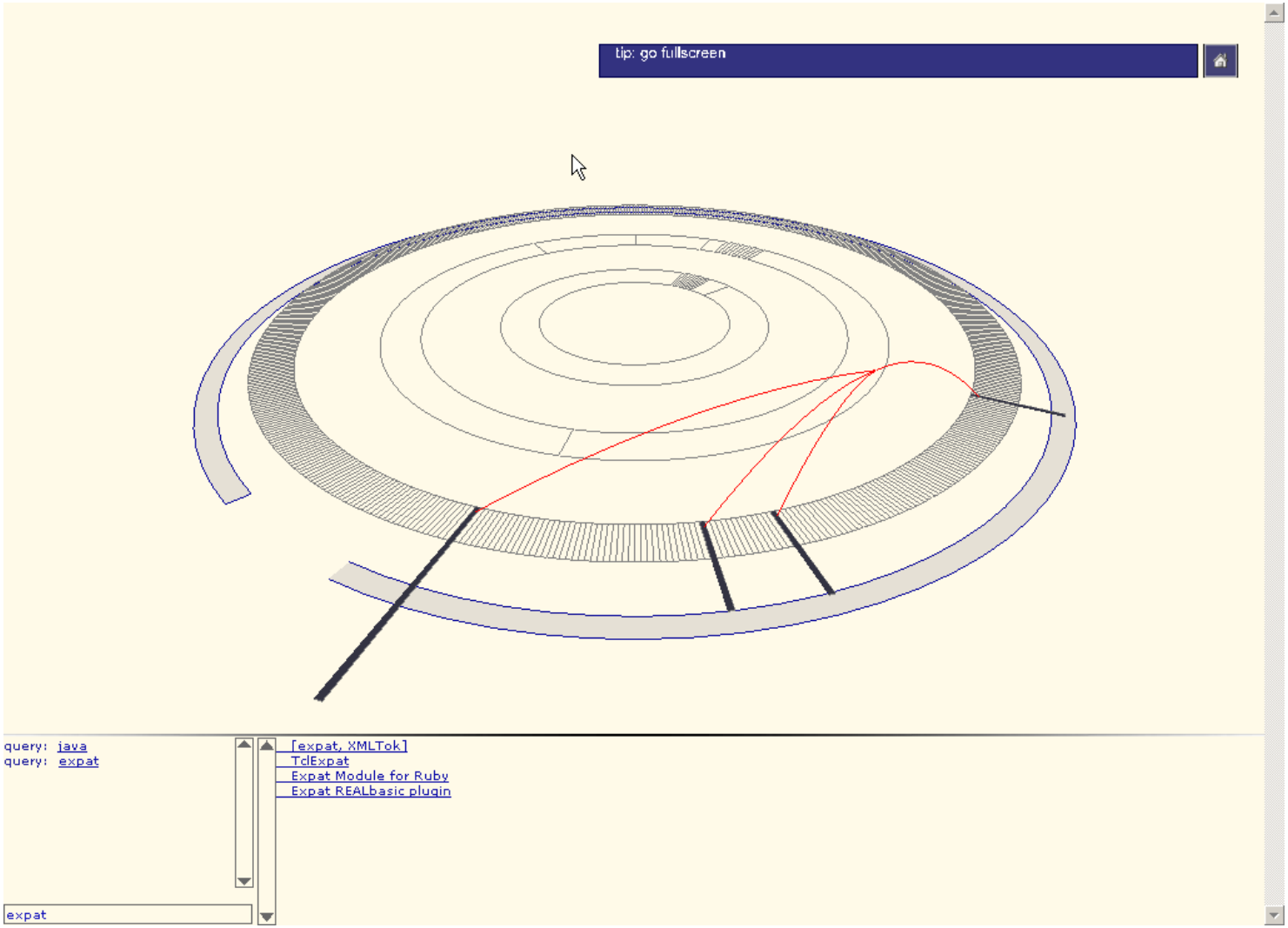
Sorting



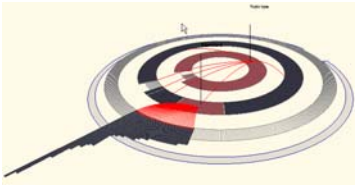


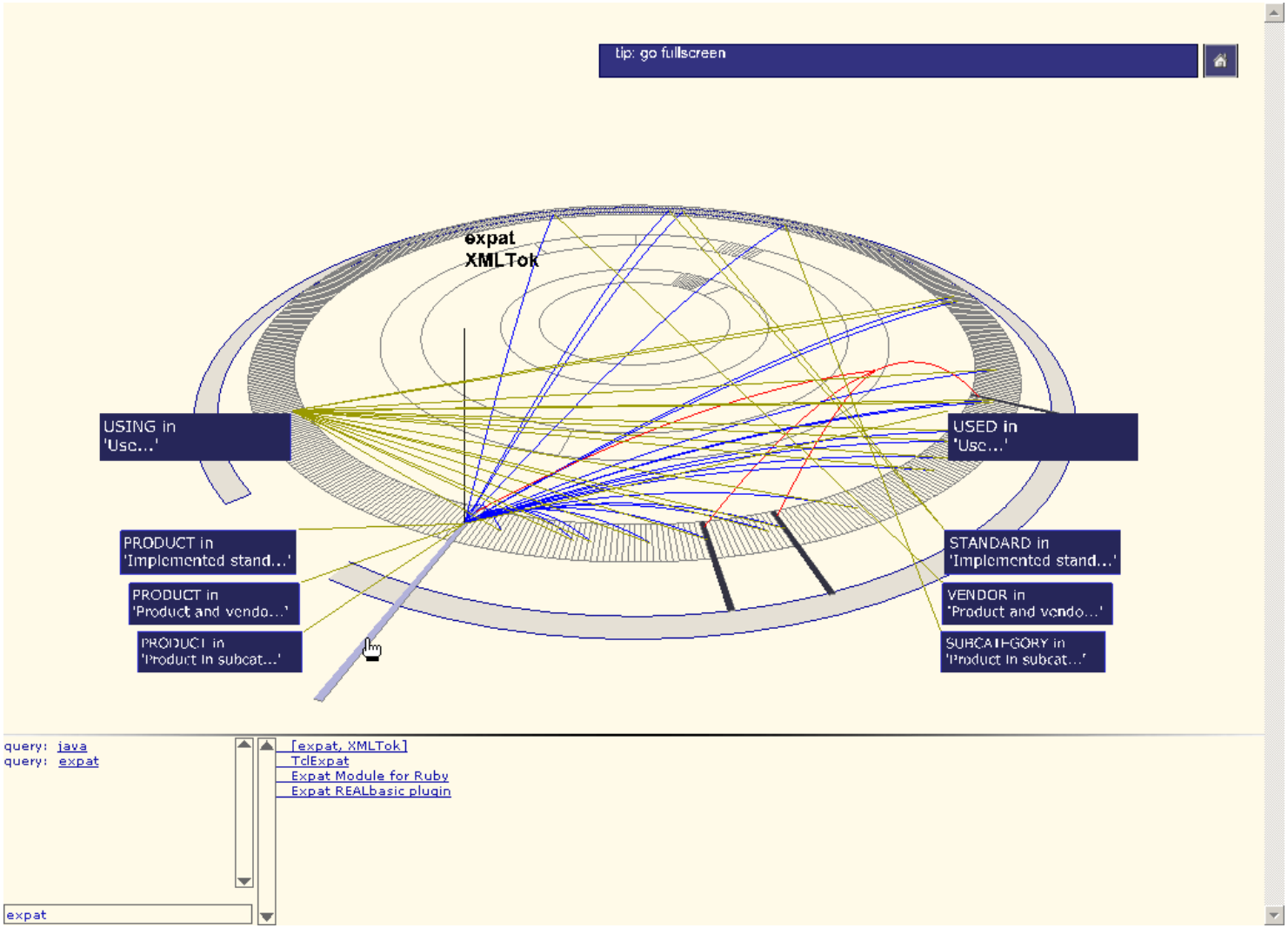
The Application





The Application





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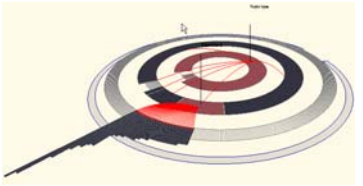
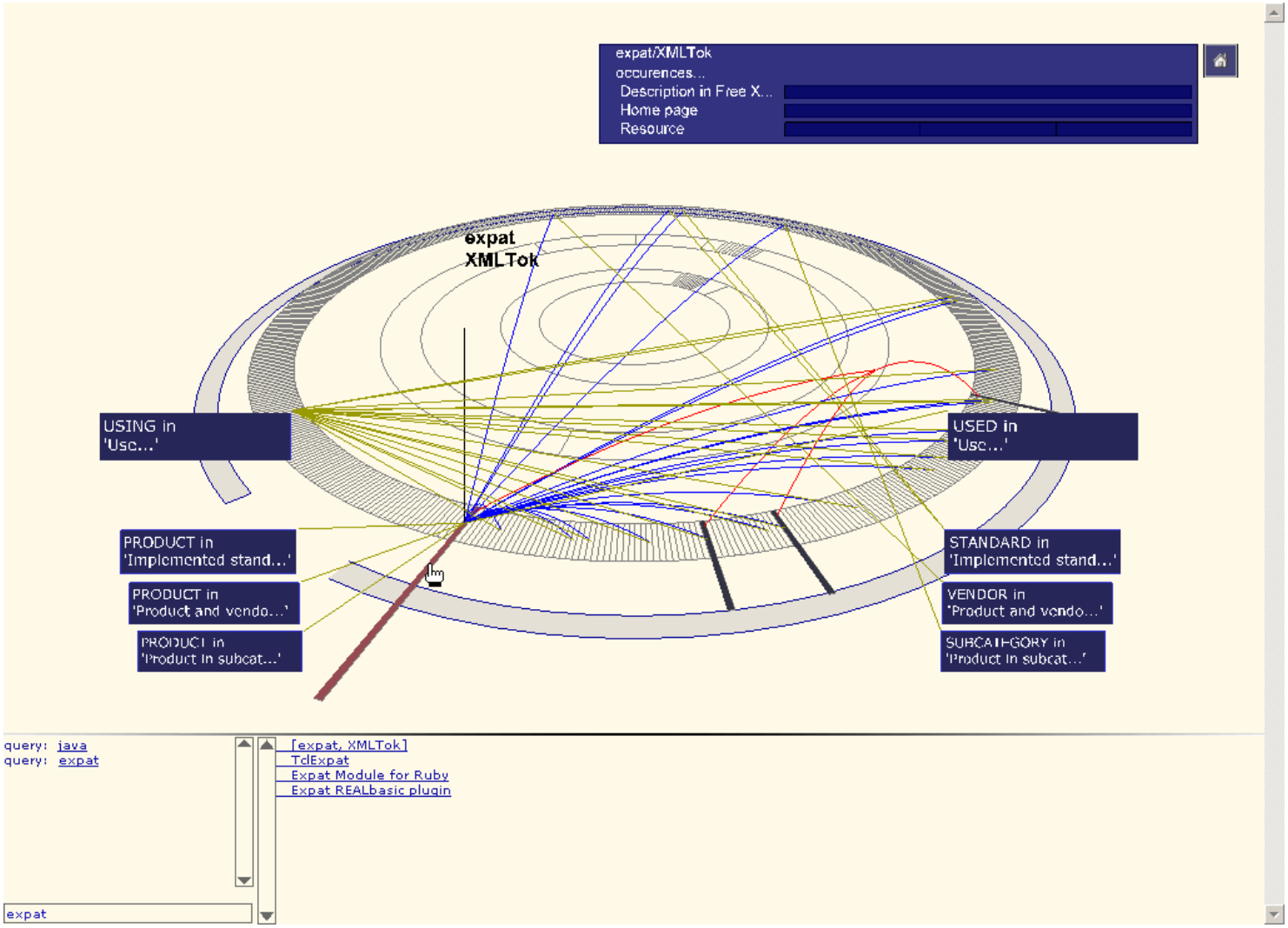
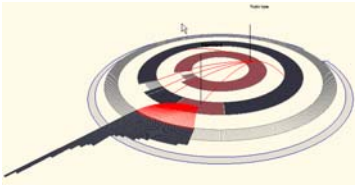
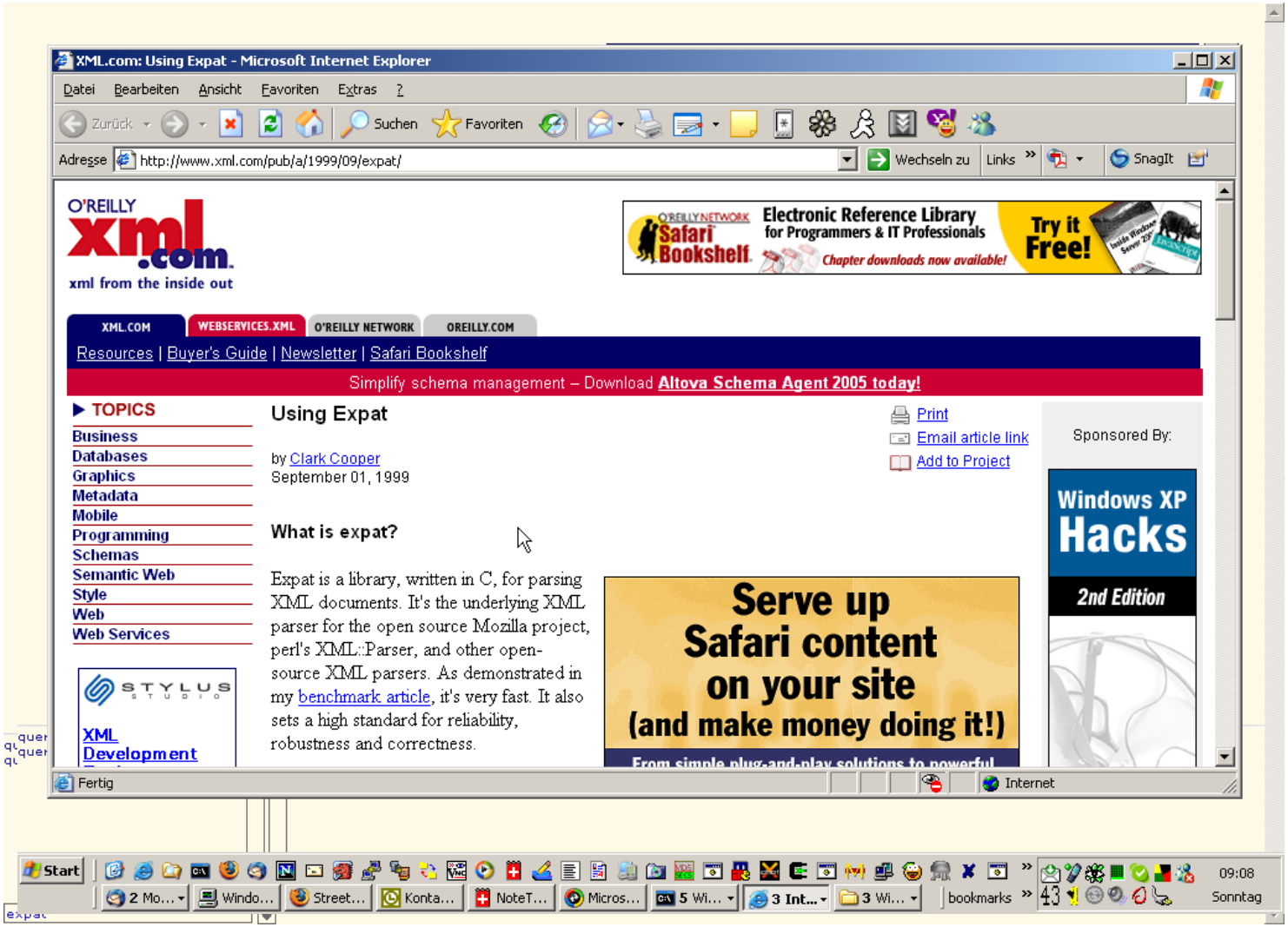
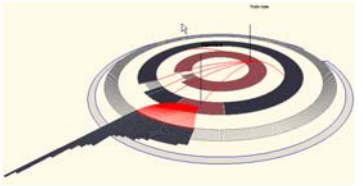




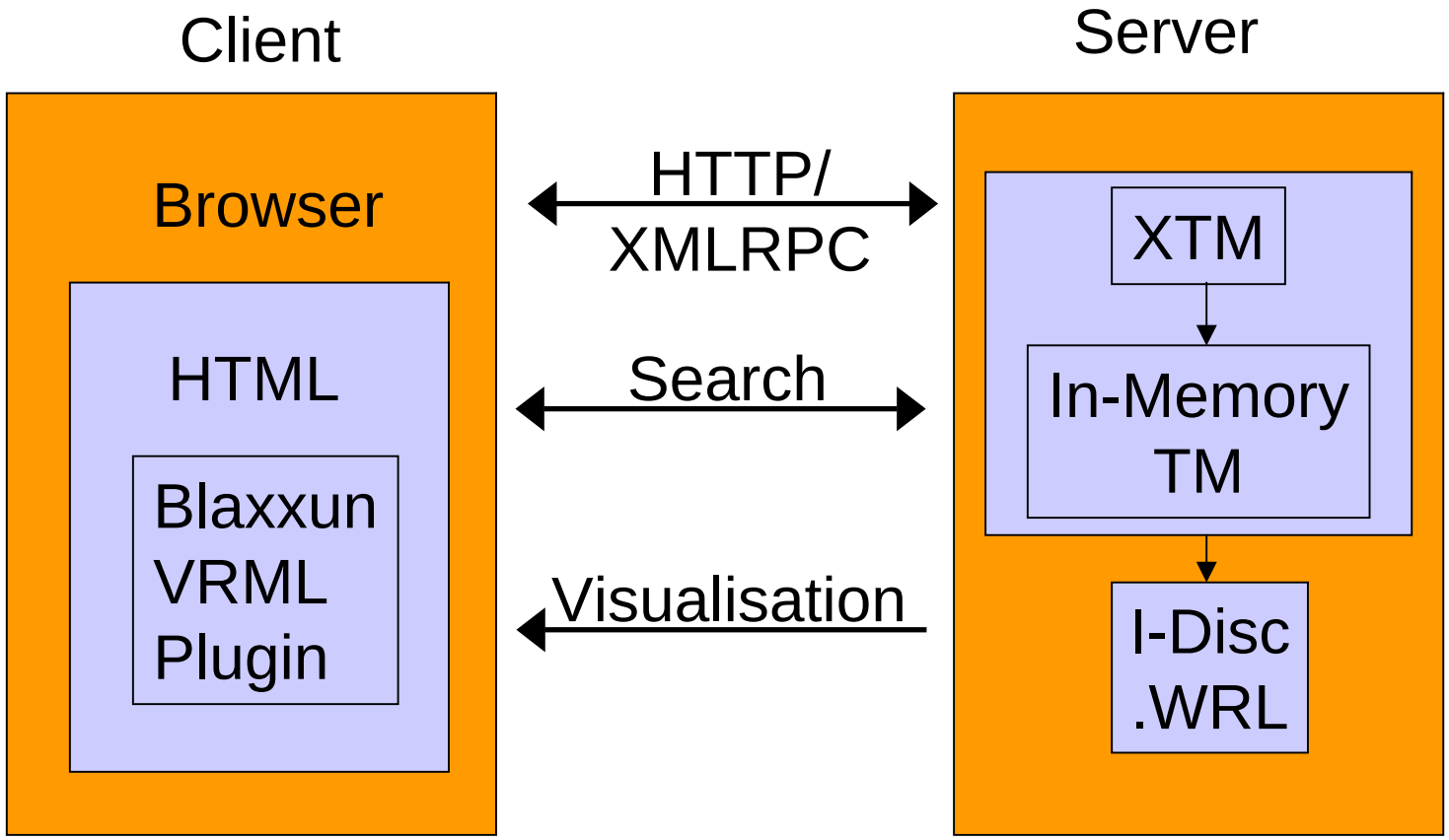
The Application

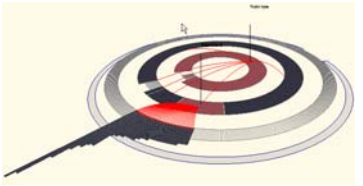






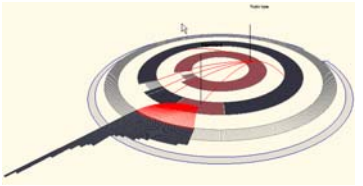
Implementation





Limitations

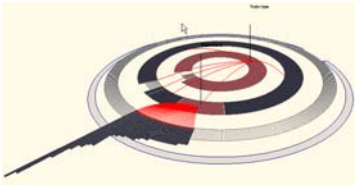
- „Simple“ Hypergraphs, flat hierarchy
- Tree structure by design
- Associations mainly between leaves
- Scaling: 100 - ~1000 topics, three levels



Navigation

- Free spatial interaction
  → exhausting
- Viewpoints from different perspectives
  → Serious loss of orientation
- Animated transition, exploiting inertia effects
  → Enhancement, but still not convincing

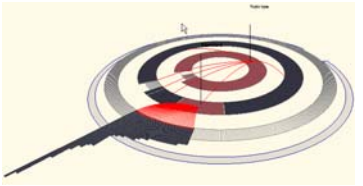
Handle for manually rotating the map



Pilot user study

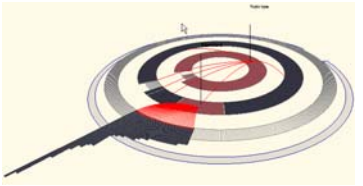
- Colleagues, staff, students (Total of 16)
- Do users accept this kind of presentation?
- Do users accept the interaction model?

- Concentric rings, rotation reported as "natural".
- Interaction with map seemed logical.



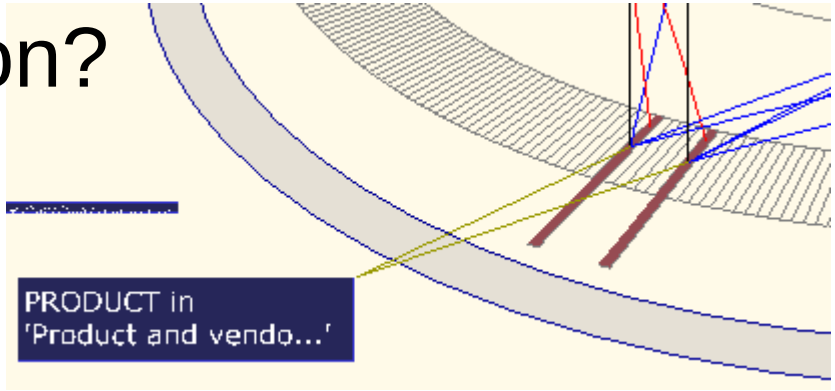
User Observations

- 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!**

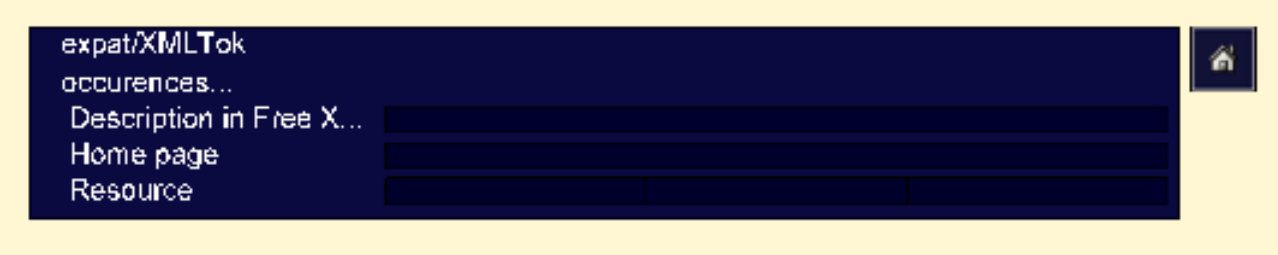


Issues

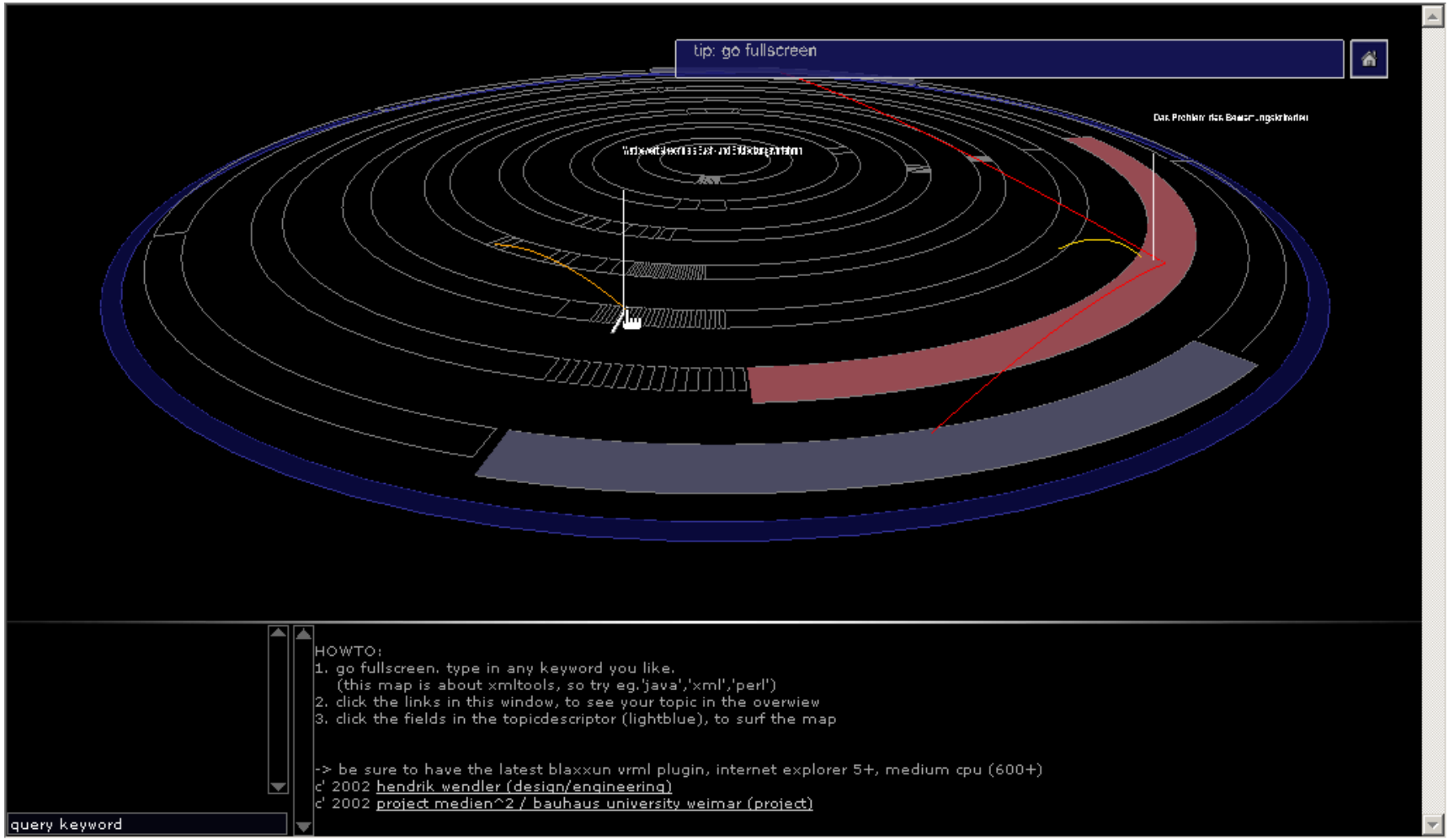
- Connection to association labels: Another association?

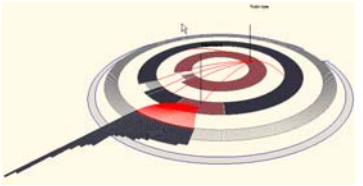


- Occurrences not always memorized



Economics – Brand Theory

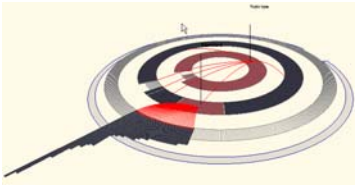




Conclusions

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

  → Understanding of 3D structure

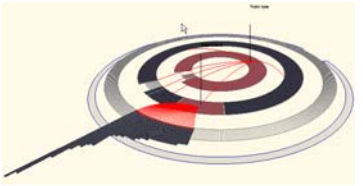


Conclusions

- 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 assocs. 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