Visual Exploration of RDF Data

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SOFSEM 2008, Nový Smokovec

Motivation

- RDF data come with schema or ontology
- not enough for the user to really get the idea
- data visualization techniques
- RDF data are graph $\rightarrow$ drawing of the graph

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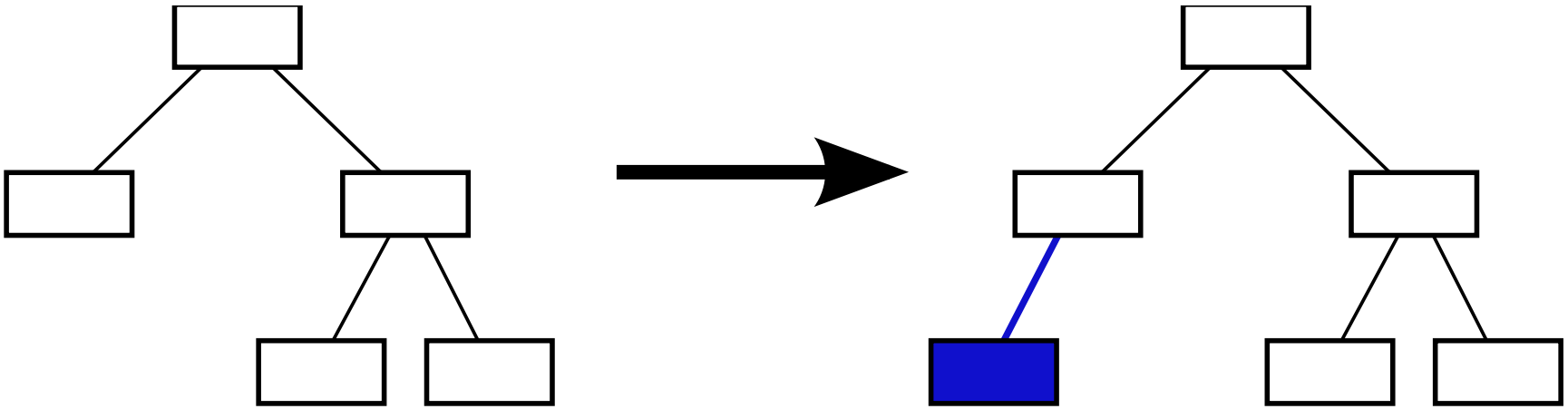
Visualization

- impossible to statically display whole data
- incremental exploration (navigation)
  - expansion, reduction, restructuring of the view
- user interaction $\longrightarrow$ **navigation tree**



Visualization criteria

- Data-imposed criteria
  - nodes with many neighbors
  - place for descendants
  - layer size increasing
- User-imposed criteria
  - easy to locate ancestors and descendants
  - follows path
  - area of drawing

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Visualization

- navigation tree – layered drawing – triangle layout
- **angle of influence** – space for descendants
- angle of influence $\longrightarrow$ minimal radius
- non-tree edges

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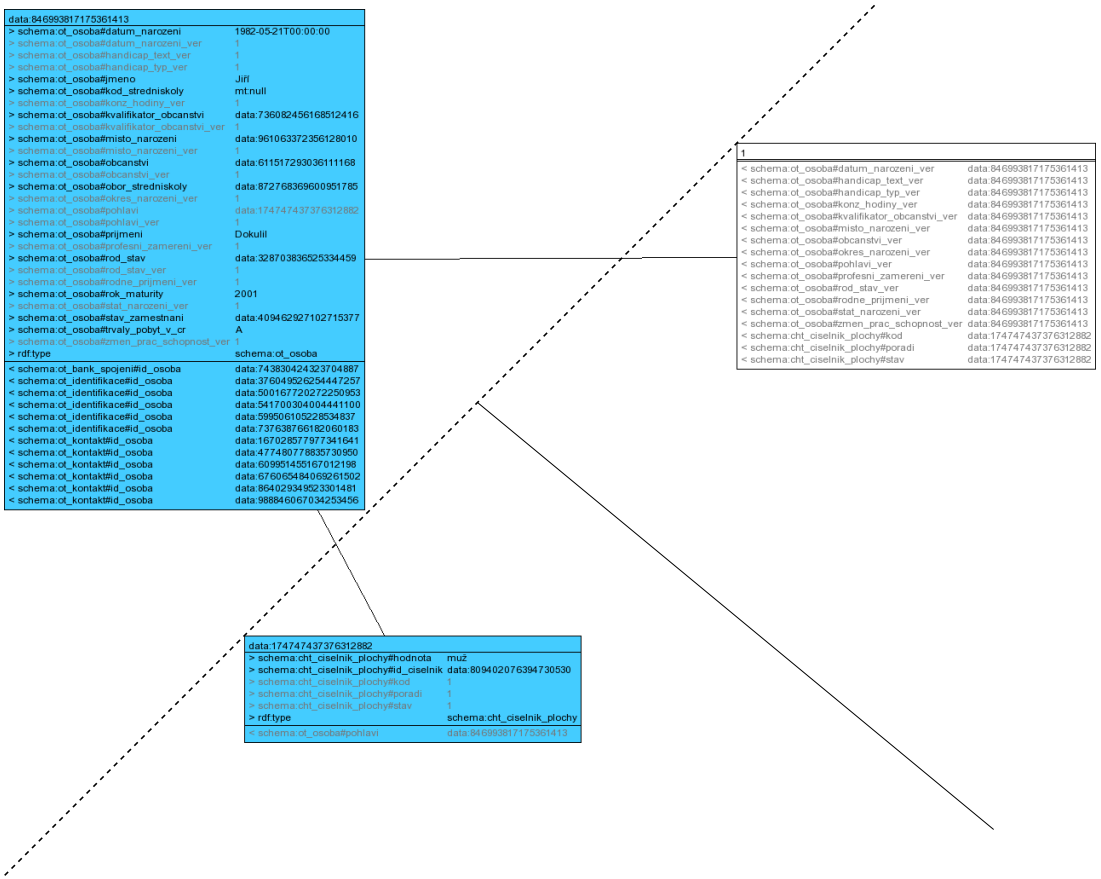
Angle of influence

- descendants of node fit into node's angle of influence
- angles of children subset of parent's angle
- parent's angle distributed according to function



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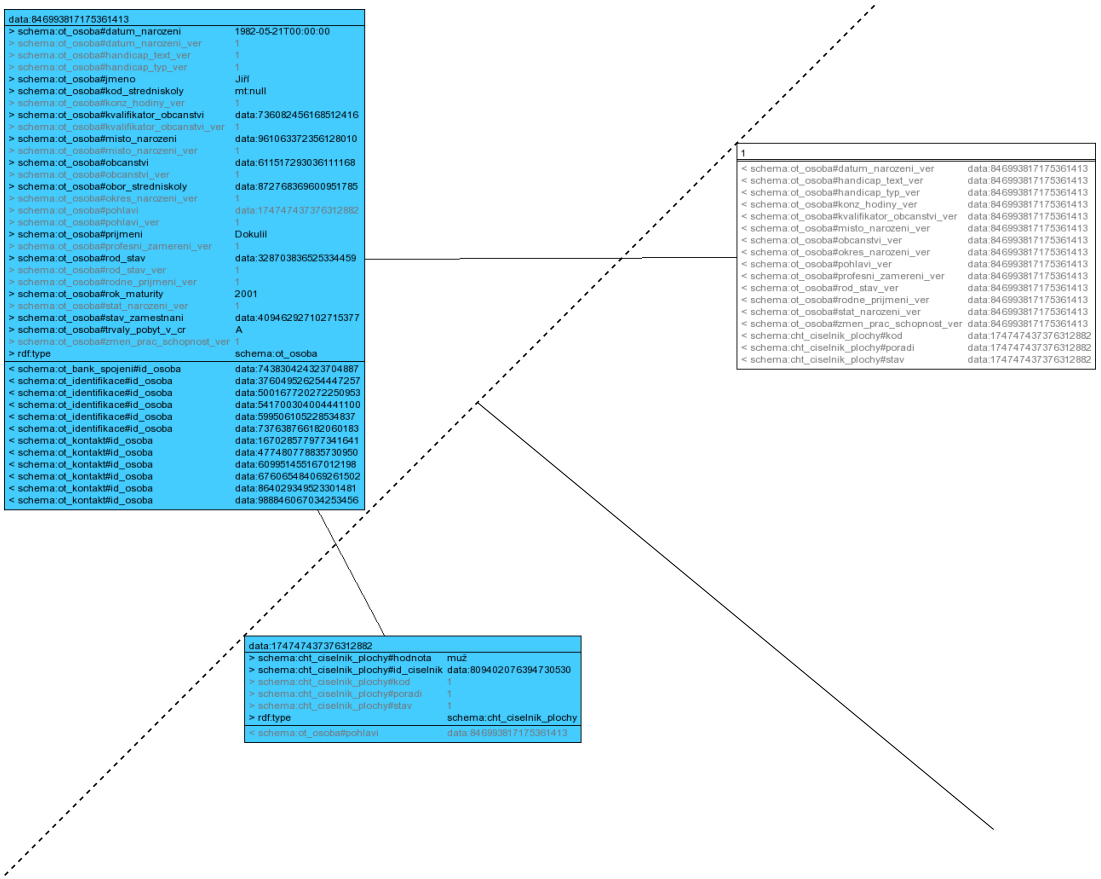

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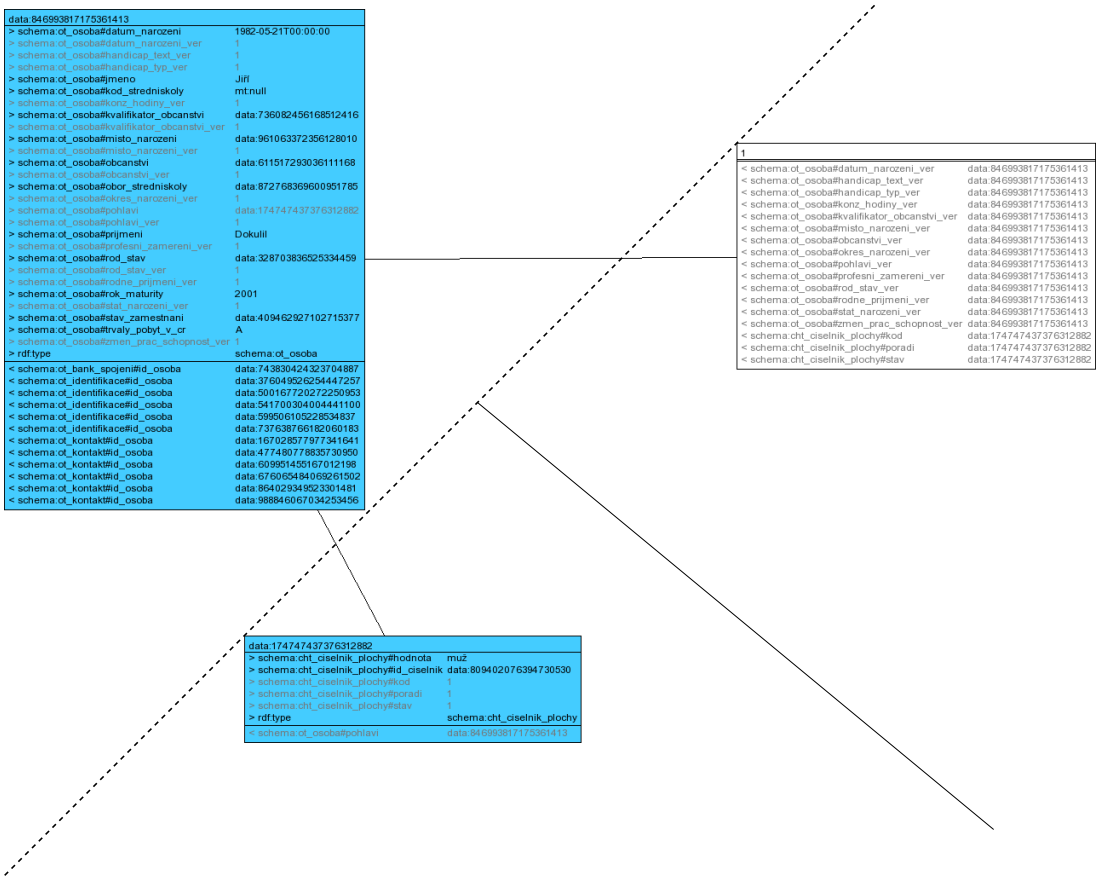

Distribution function – height of children

- each node gets portion of parent's angle proportional to height of its children
- exponential area

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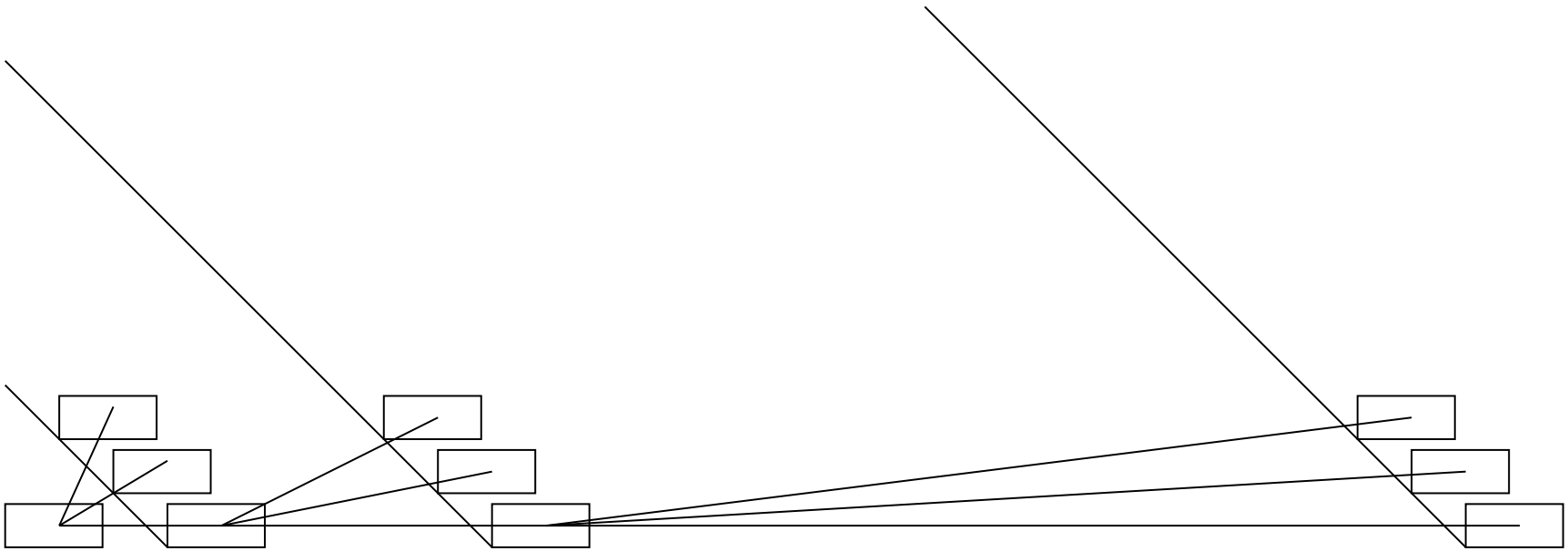

Distribution function – count of descendants

- u_i children of v
- $|T(v)|$ number of nodes in tree rooted in v
- u_i is assigned $\frac{|T(u_i)|}{|T(v)|}$ of parent's angle
- the radius of last layer is bounded by $N(2 \cdot H + W)$
- basic idea of proof
  - radius is increased by nodes with small angle of influence and many children
  - each node gets proportional share of the whole layer for its children – not only within parent's angle
  - node with many children gets large piece of the whole layer

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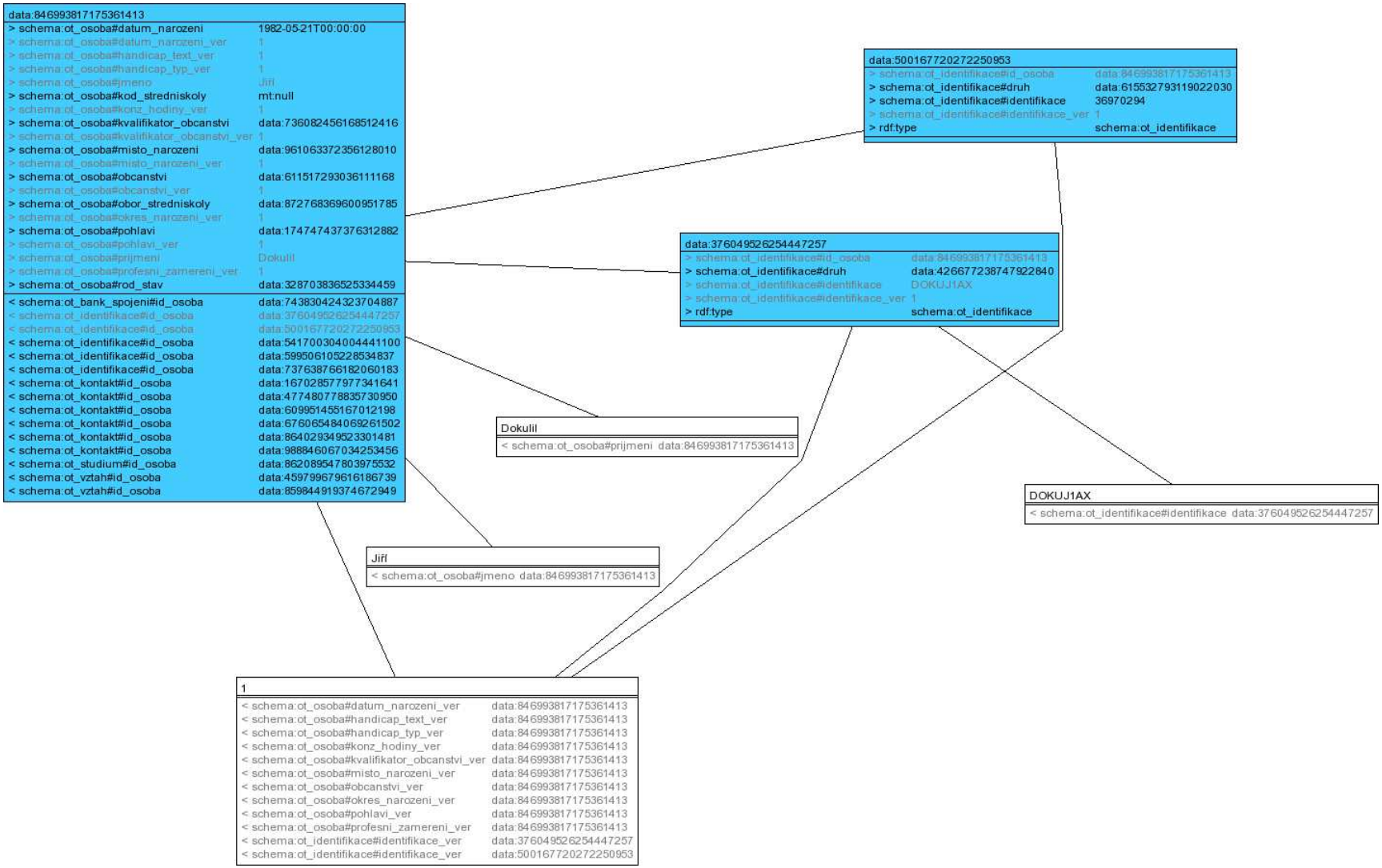
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Conclusion

- Visualization – user discovers structure of data
- Layout – quadratic area – optimal
- Implementation – Trisolda infrastructure

Future work

- Query construction
- Non-tree edges
- already implemented – technical report under way

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