# Topic Maps introduction

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# Introduction Morpheus

- Morpheus is a software company based in Maastricht
  - Founded: 1999
  - Focus: knowledge engineering and topic mapping
  - Employees: information- / knowledge experts
- Partnership with Ontopia
  - Implementation partner
  - Value added reseller for OKS
- Expertise in Topic Maps
  - Informing / Evangelism
  - Conceptual modelling
  - Implementation
  - Training

# Scope

- I want to
  - Search in a meaningful way (better than Google)
  - Find information without precisely knowing what I am looking for (spontaneous knowledge creation)
  - Share and retrieve information among colleagues
  - Use my own terminology and store personal knowledge
- Then I need something that can
  - Clearly denote and identify concepts
  - Relate concepts in a meaningful way
  - Display all information about a concept in one overview
- An answer to this is
  - Topic Maps and PSI's

# Topic Maps and PSI's

- With Topic Maps and PSI's I can
  - Organize large sources of information
  - Capture and share common knowledge
  - Represent complex rules and processes
  - Present information in a subject based manner
  - Manage distributed knowledge and information
  - Aggregate information and knowledge
- The result will be 'Seamless knowledge'

# Topic Maps and indices

- The rationale of Topic Maps can be compared to the contents and index of a book
  - Distinction between information (contents) en knowledge (index)
  - Index gives description and overview on domain
  - Contents give full detail
- In Topic Maps, the ‘index’ is extended
  - Not only references to contents
  - Also includes associations to other concepts in index
- Topic map represents a complete domain
  - Advanced way of adding metadata
  - Information is stored/accessed subject based

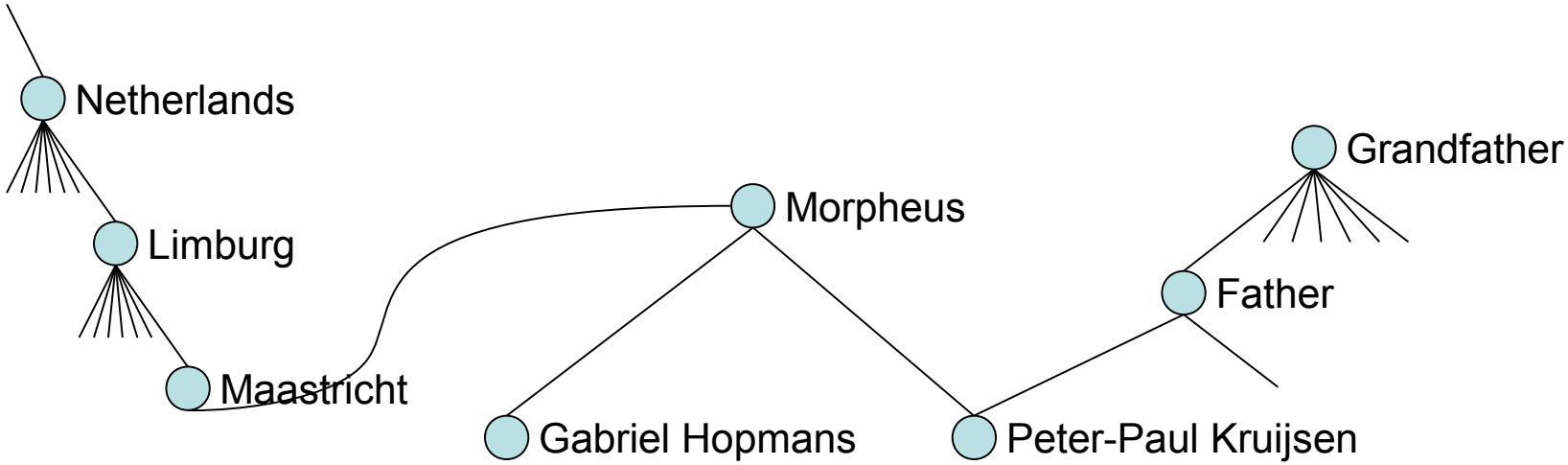
# The TAO of Topic Maps

- The TAO of Topic Maps describes the three main concepts within Topic Maps
  - Topics
    - Represent ‘subjects’ in the real world
  - Associations
    - Make connections between topics
  - Occurrences
    - Relate topics to information sources

– http://www.ontopia.net/topicmaps/materials/tao.html

# The TAO in practice

- Topics for people and organisations
  - 'Person' en 'organisation' are topics themselves
- Typed associations
  - 'Employment' is also a topic
- References to information sources



# Ontology

- By typing topics, associations and occurrences, we get
  - Meaningful information
  - A semantic network
  - Knowledge
- Key subjects make up an ontology
  - Domain description within topic map itself
  - Can be used to model hierarchies
    - Thesauri / Classifications / Part-whole
- Ontology types are topics themselves

# Identification

- Identification of concepts is essential to enable sharing of information
- Name based identification is not good enough
  - Synonyms / homonyms
- By identifying concepts we can attach multiple names and charachteristics
  - Multilingual naming / Various target groups
    - Medical expert versus patient
- Identification by means of PSI's
  - 'http://psi.oasis-open.org/iso/639/#eng' for 'english'
  - For computers: identification based on URL's
  - For humans: indicators describing concepts

# Querying

- Because a topic map is highly structured, it can be queried by semantic queries
  - 'Give me all names of grandfathers of directors of Limburgian companies'
  - *tolog* provides predicate based query language
  - Official *TMQL* to be published as ISO standard
- Queries are used in applications for navigation and presentation purposes
- Inference rules to generate new information

# Constraining

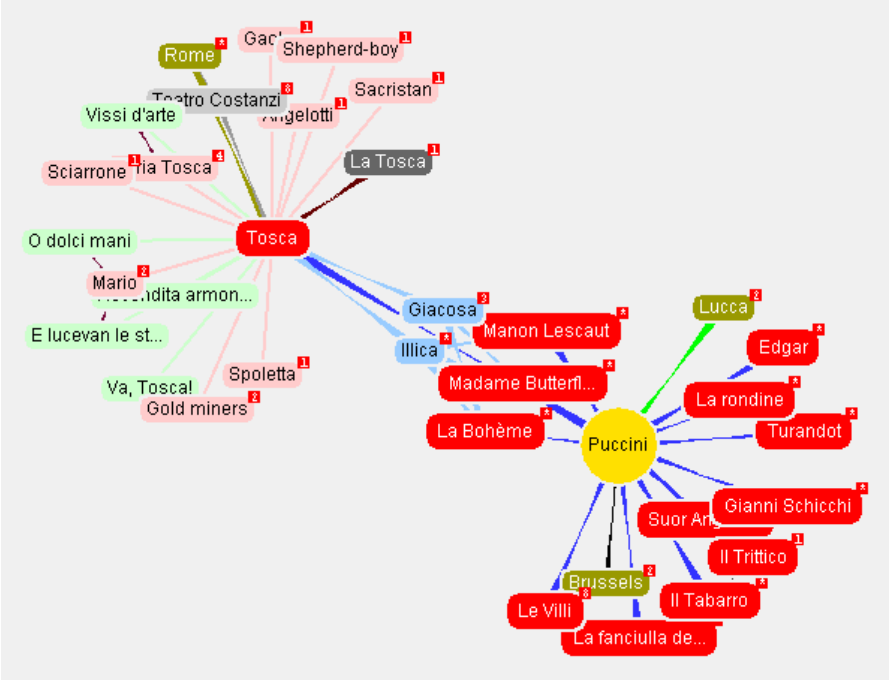
- Allows to restrict the otherwise free and open topic map content
- In Topic Maps you are allowed to state
  - 'Pink floyd' was recorded by 'Dark side of the moon'
  - 'Peter-Paul' is of type 'Morpheus'
- The Topic Maps Constraint Language (*TMCL*) makes sure to avoid these mistakes by introducing constraints on topic map content
  - An 'employer' in an 'employment' association should always be an organisation
  - A person may have only one date of birth

# Filtering

- By using *scope*, data in a topic map can be filtered for specific goals
  - Multilingual interfacing
  - Contextualising information
  - Include source of information
  - Specific target groups
  - Personal settings
- Scope is yet another set of topics
  - Scope on ‘french’, ‘expert term’, ‘gossip’

# Visualising

- Tools are available for graphical presentation of a topic map
  - In a webapplication
  - Stand-alone
- Offers overview
  - Topic Maps
  - RDF
- Configurable
  - Color / Shapes
  - Branching



# Merging

- Topic maps can be merged automatically based on PSI's
  - Seamless knowledge emerges by sharing concepts
- Merging topic maps enables endless possibilities
  - Information integration between domains
  - Aggregating and sharing knowledge among organisations
  - Knowledge federation from various sources
  - Distributed knowledge management
  - Re-use of knowledge throughout various applications

# Possible applications

- Topic Maps and the five techniques we just saw can be applied in numerous ways
  - Intelligent indexes
    - Single point of access to information
    - Intuitive navigation
  - Dual / multiple classification
    - Concepts can be classified along multiple dimensions
  - Topic Maps driven web portals
    - Navigation and content are driven by Topic Maps
  - Application integration
    - ERP/CMS/...
  - E-Learning systems
    - Brainbank

# Conclusion

- Topic Maps make a good tool for
  - Intuitive overviews on information
  - Sharing knowledge
  - Integrating information and applications
  - Maintenance of existing systems
- The possibilities are endless
  - For today: get inspired
  - For those interested: more info / training course
  - Morpheus would like to help you get started