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Intelligent Content Management

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TMRA'05 - International Workshop on
Topic Map Research and Applications
The Westin, Leipzig, Germany
6-7th October 2005

Concept Glossary Manager - Topic Maps Engine and Navigator

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Concept Glossary Manager (CGM)

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Presentation outline

- ICONS project
- Concept Glossary Manager Overview
- CGM as Topic Maps Engine
- Topic Maps Script Language (TMSL)
- An Ontology Driven Topic Maps Visualization and Modification
- Conclusions

Expected presentation time: 20 minutes

Intelligent CONtent Management System

http://www.icons.rodan.pl/

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January 2002 - April 2004.

Cooperation between 7 partners from universities and industry.

Realised within the European Commission Fifth Framework Programme.

The ICONS project focused on bringing together into a coherent, web-based system architecture the advanced research results, technologies, and standards, in order to develop and further exploit the knowledge-based, multimedia content management platform.

Result: 19 modules were implemented from scratch or as an extension of the existing open source modules

Concept Glossary Manager Objective

CGM allows to store and process concepts and concepts' relations.

A concept is an information about knowledge element used in a target application.

Single concept can be described by:

- names and definitions written in various languages
- links to external resources
- relations with other concepts

structure of concept structure of topic

Components of Concept Glossary Manager

CGM is a tool which helps create, modify and visualize Topic Maps.

CGM consist of the following components:

- Topic Maps Engine
- Topic Maps Navigator
- Topic Maps Server
- Topic Maps Editor
- Touch Graph Applet

Topic Maps Editor

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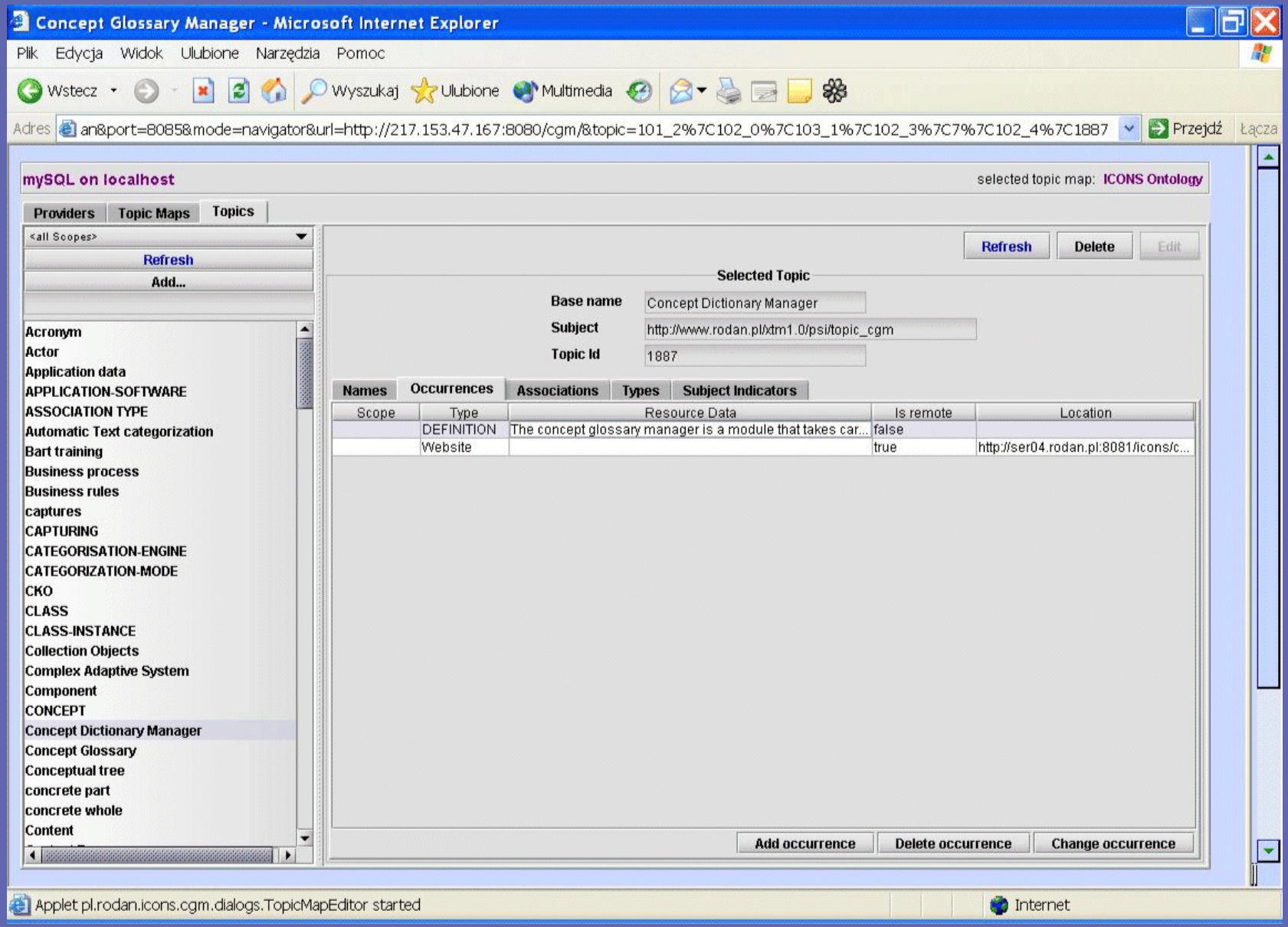
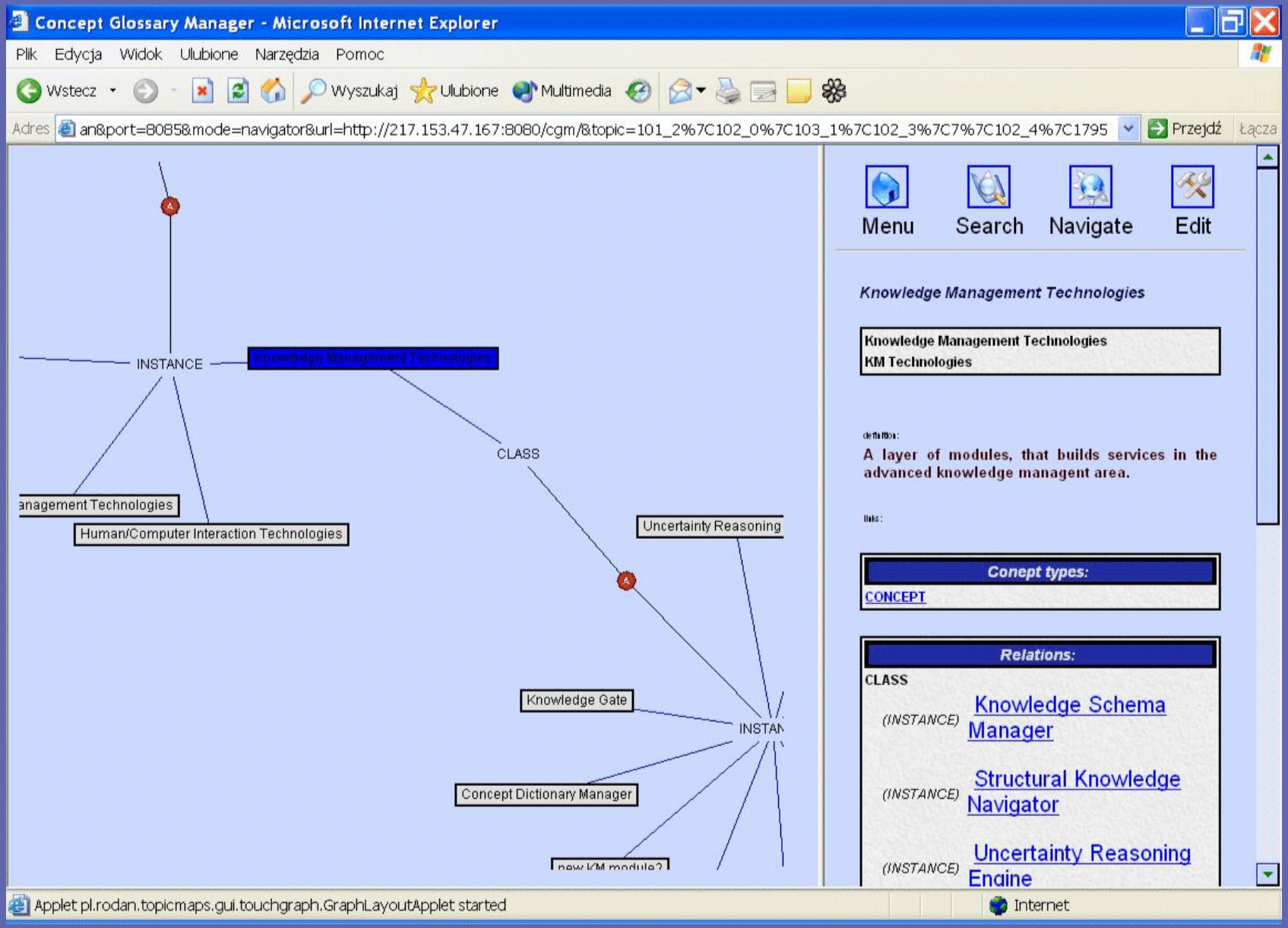


Touch Graph Applet



CGM as Topic Maps Engine

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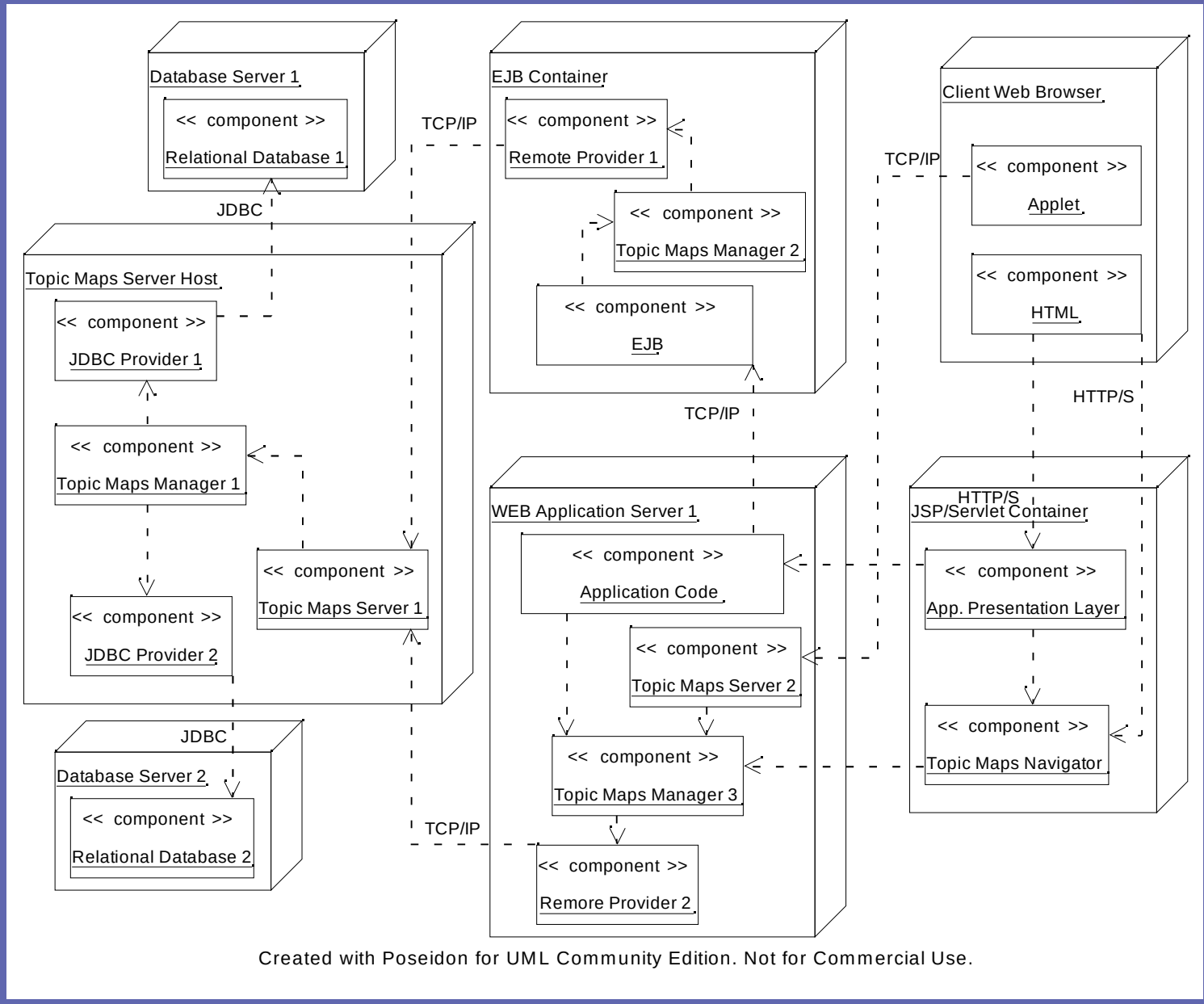
- Java API
- Implementations: „buffered”, „memory”, „jdbc”, „remote”, „filtered”.
- Useful features: XTM import/export, hierarchies support, full text search, Tolog, XMI import/export
- Advanced features:
  - Distributed computing
  - User Rights Management
  - Topic Maps Script Language (TMSL)
  - Versioning mechanism

Distributed Computing



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User Rights Management

„Filtered” implementation executes user rights on the Topic Map’s content.

User right types: view, create, remove, modify, modify types, activate, deactivate …

A set of associations between users, user groups, topic classes, association classes, right types and hierarchies defines user rights.

Additional features: topics and associations owners, rights to the user’s account, rights to the topic characteristics.

Topic Maps Script Language

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- Main assumptions:
  - TMSL bases on Java grammar
  - TMSL embeds constructs from TMQL and TMCL
- Implemented prototype:
  - Uses ANTLR (extends java.g grammar)
  - Supports almost all Java constructs
  - Supports a SELECT expression from the TMQL
  - An execution context can be extended by a programmer
  - Many functions are already added: TM modification functions, math operations, strings operations, arrays operations, etc.

Example TMSL based TM validator


```
action = getValidationAction();
if (action == "create" || action == "makeActive” || action == "modify")
   {
   using mytm for i"http://www.rodan.pl/psi/mytm#";

   ass = getValidatedAssociation();
   oldAss = getValidatedAssociation(false);
   person = rolePlayer(ass, mytm:person-assigned-to-category);
   category = rolePlayer(ass, mytm:category-assigned-to-person);
   personRole = rolePlayer(ass, mytm:role-of-person-in-category);

   if (personRole == mytm:investigator){
        table = select count($UNIT) where
                        mytm:employment(
                        person : mytm:employee,
                        $UNIT : mytm:employer,
                ),
                mytm:unit-categories(
                        $UNIT : mytm:unit-having-category,
                        category : mytm:category-belonging-to-unit,
                        mytm:main-unit: mytm:unit-function-for-category
                );
        if (table[0][0] == 0){
                return "Investigator must be employed "
                        + "in the main unit of the category!";
        }
   }
```

Ontology Driven Topic Maps Visualization and Modification

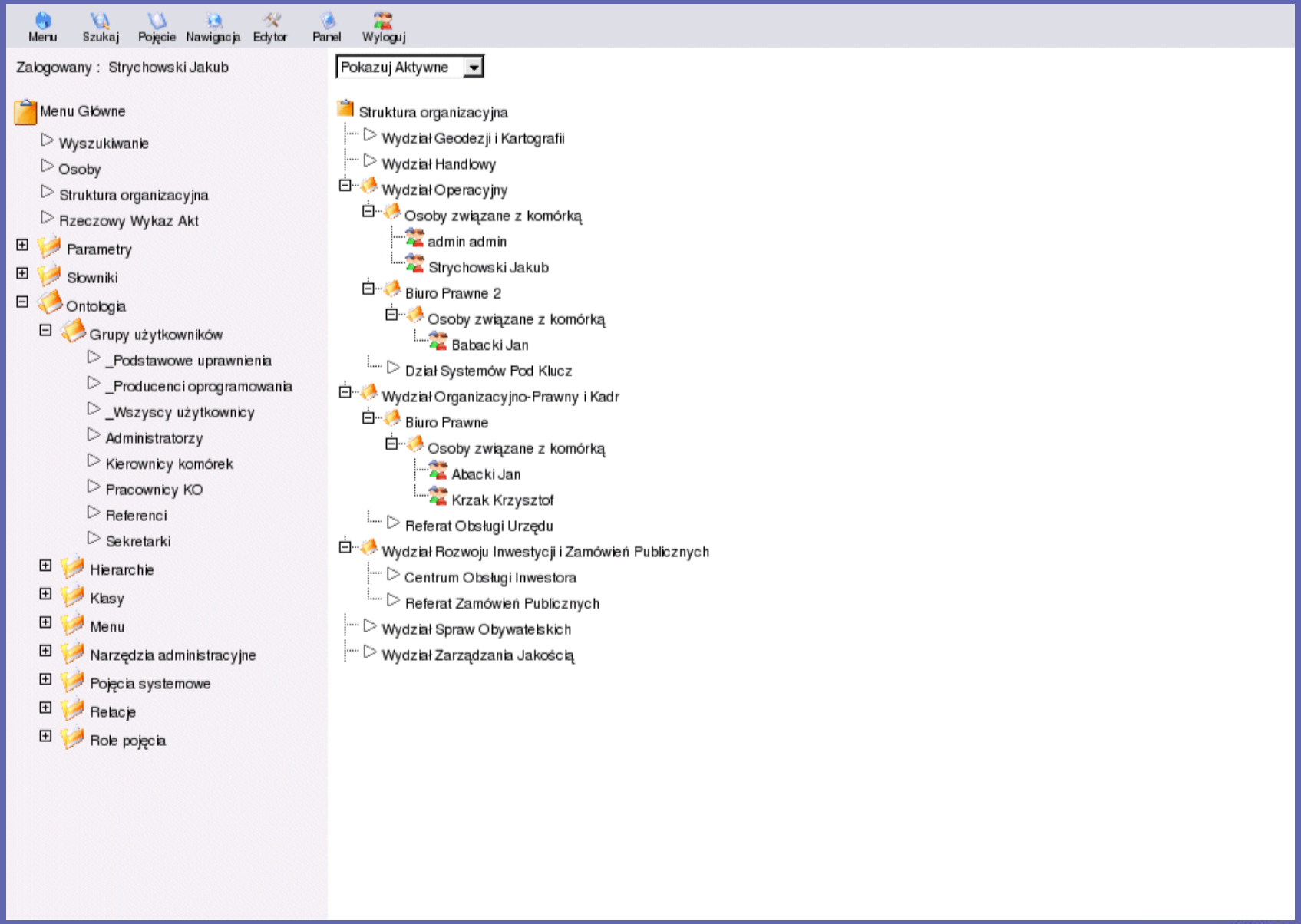
A modification of the topic map's content could be very hard for a user who might not even be aware that such standard as "Topic Maps" exists.

Part of the Topic Map called an ontology defines the structure of the knowledge represented in the Topic Map.

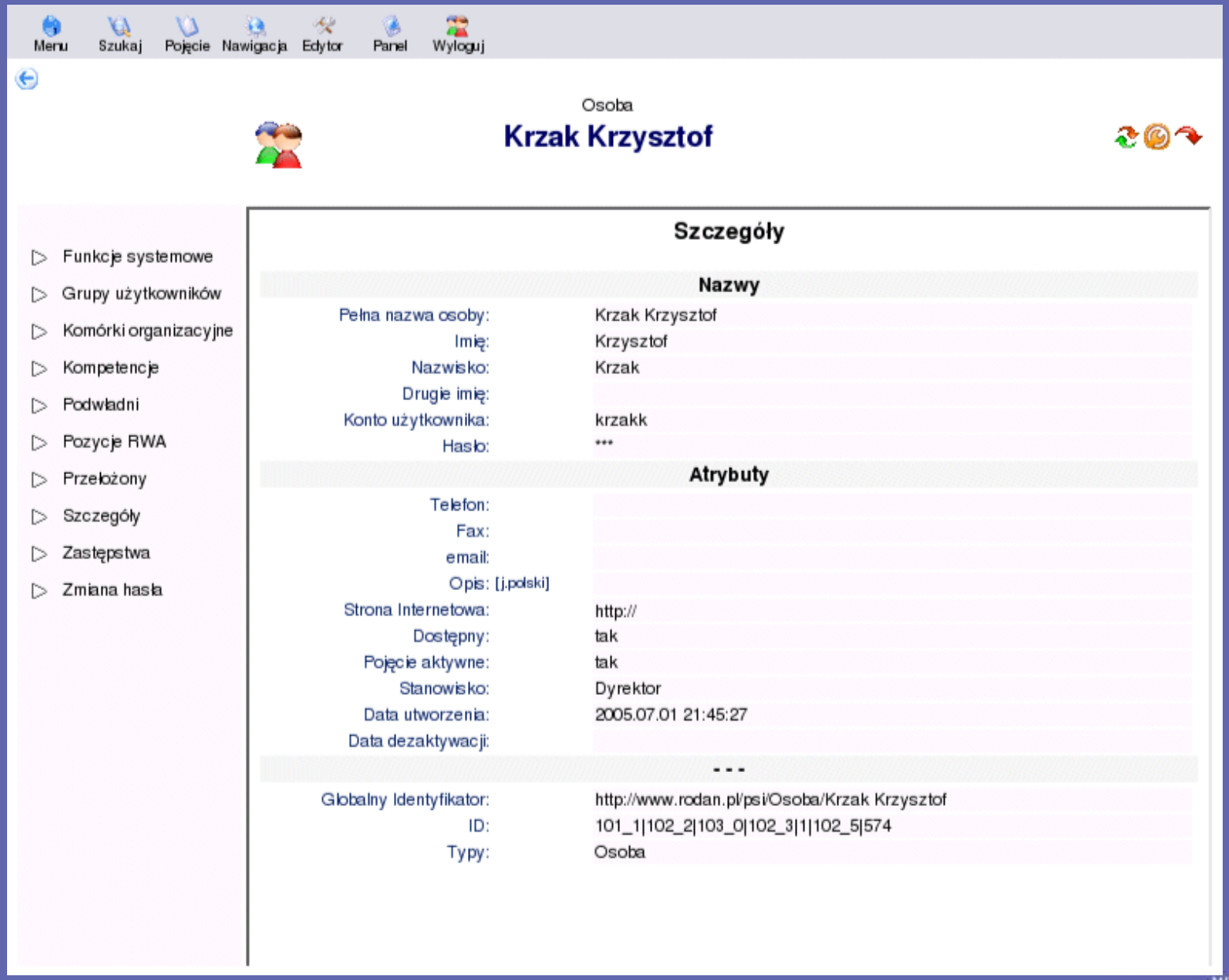
Topic Maps Navigator uses ontology to generate specialized interfaces for visualization and modification of the topics and associations.

The ontology controls also navigation.

Main Menu and example hierarchy



Topic's details



Creating association

Conclusions

The generative, ontology driven user interfaces allows rapidly develop applications responsible for a declarative knowledge management.

Some novel features like user rights management, ontology driven topic map management in the Web environment, and TMSL could be very helpful in real life applications.

Smart, generative, ontological user interfaces available within the CGM Topic Map Navigator could considerable decrease development time.

Thanks to CGM, the first version of the EWD-P system was developed in 4 months. More then 35% acceptance test cases for the whole system based on the Topic Map Navigator

Thank You For Your Attention !

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