

# A Social Item Filtering Approach for a Mobile Semantic Desktop Application

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# Motivation

- **Personal Information Management (PIM)**
  - Acquisition, maintenance, retrieval, and sharing of information in the personal space of information, e.g. messages, documents, links
  - Semantic Desktop
    - Support PIM with Semantic Web technologies and personal ontologies
- **Mobile devices (PDA, ...)**
  - „Mobile Semantic Desktop“ appears promising
    - Limitations of devices make information access more difficult
    - Additional data such as phone calls, SMS, ...
  - Current approaches not geared towards mobile scenario
- **SeMoDesk**
  - Semantic Desktop idea for mobile devices (Windows Mobile PDA)
  - Context-aware recommendation of resources
  - Social recommender (using other users' ontologies)

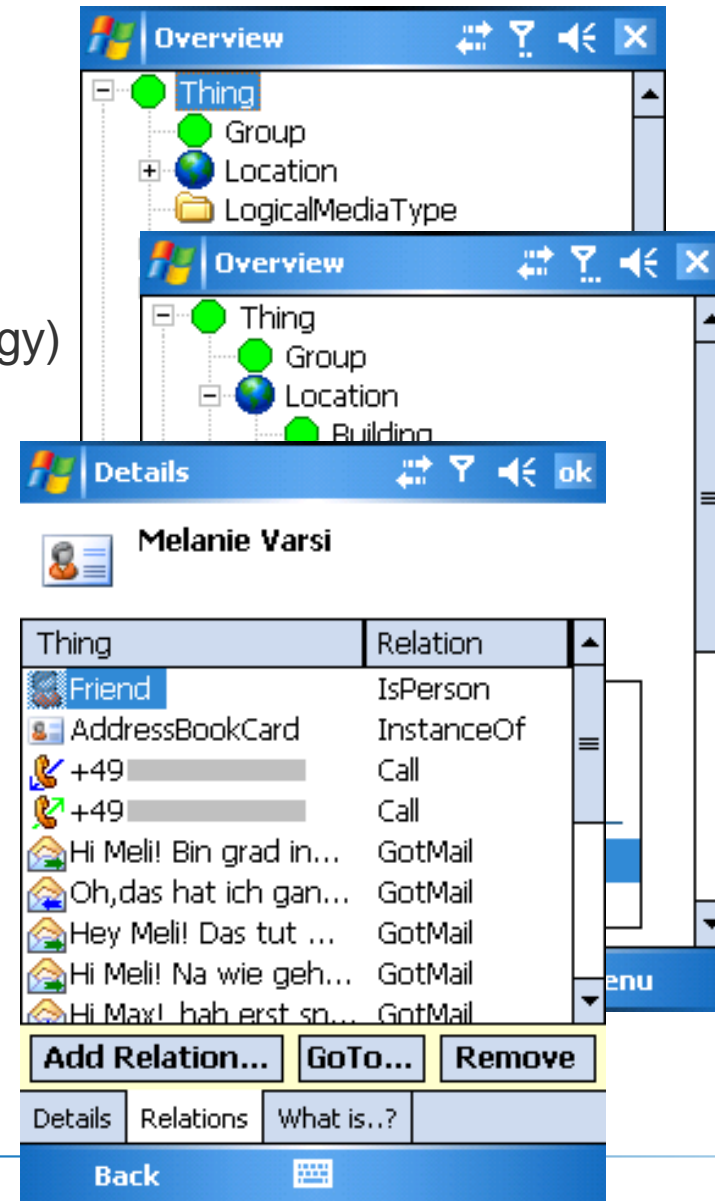
# SeMoDesk

- Semantic Desktop

- PIMO (Personal Information Model Ontology)
- Distinguish between
  - Concepts (e.g. „project“ or „topic“)
  - Resources (e.g. file or documents)

- Managing the Ontology

- User defines subclasses
- Define relationships
  - Document „is related to“ a project
- (Automatic) integration of data sources
  - e.g. incoming calls
- Retrieval of relations



The screenshot displays the SeMoDesk interface with three overlapping windows:

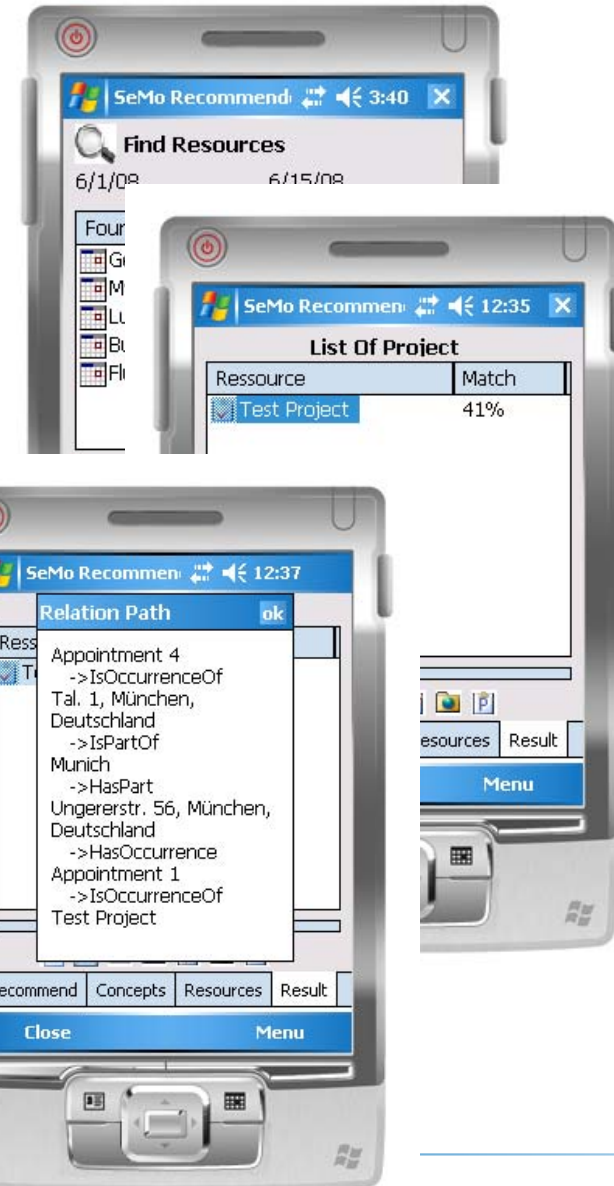
- Overview (top):** Shows a hierarchical ontology tree with nodes: Thing (green circle), Group (green circle), Location (blue globe), and LogicalMediaType (yellow folder).
- Overview (middle):** Shows a similar tree with an additional node: Building (green circle).
- Details (bottom):** Shows the details for the 'Thing' concept, including a user profile for 'Melanie Varsi' and a table of relationships.

Thing	Relation
Friend	IsPerson
AddressBookCard	InstanceOf
+49 [redacted]	Call
+49 [redacted]	Call
Hi Meli! Bin grad in...	GotMail
Oh,das hat ich gan...	GotMail
Hey Meli! Das tut ...	GotMail
Hi Meli! Na wie geh...	GotMail
Hi Max! hab erst sp...	GotMail

At the bottom of the Details window, there are buttons for 'Add Relation...', 'GoTo...', and 'Remove'. Below these are tabs for 'Details', 'Relations', and 'What is..?'. A 'Back' button is visible at the very bottom.

# Recommending Resources

- Browsing of resources is not enough
  - Only direct relations are shown
  - Example: upcoming meeting  
→ recommend related documents
- Our recommendation function has two steps:
  1. Finding resources that are of interest right now („On Schedule“)
  2. Recommending other resources
    - Starting from selected node in ontology tree
    - Ranked by evaluation value („Match“)
    - Option to select by type
    - Option to display path



## Recommending Resources (Details)

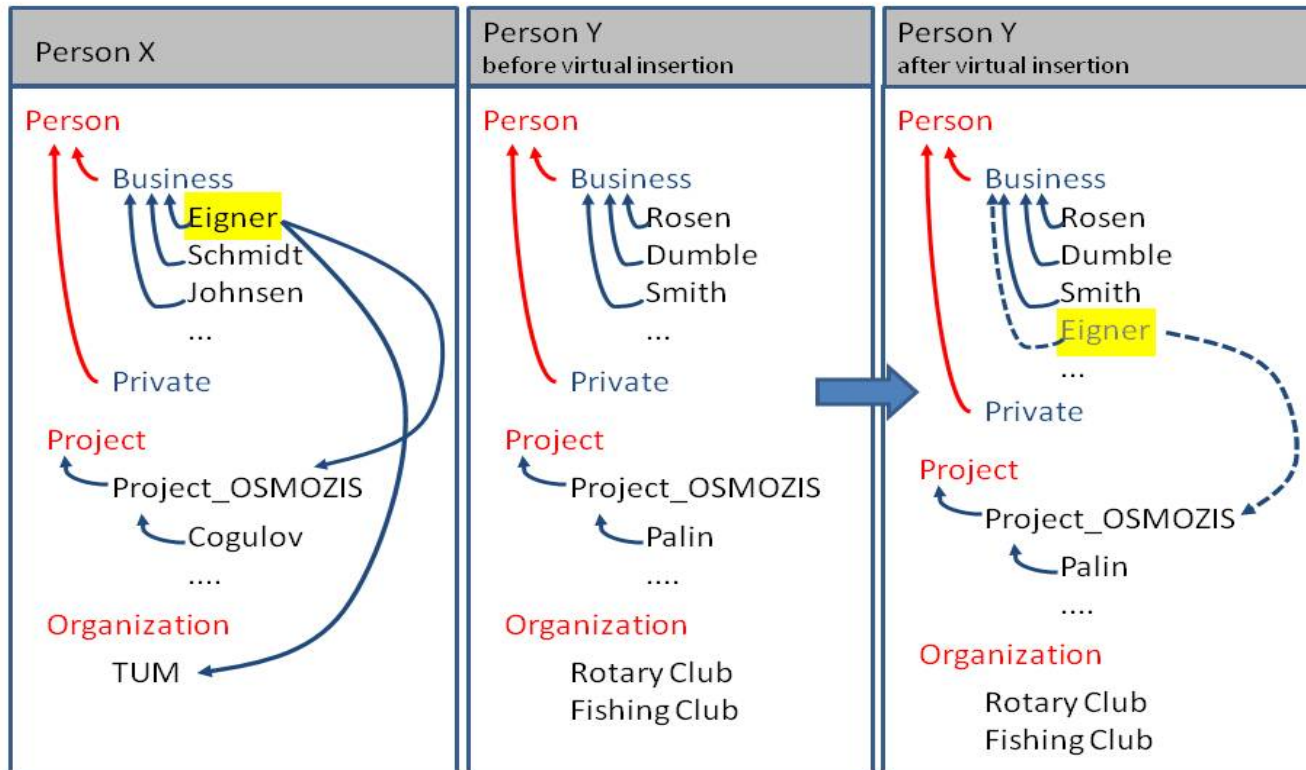
- Breadth first search, starting from selected node
  - Analyze every node according to evaluation function
- (Configurable) evaluation function:
$$f = a * depth + b * concept + c * relation$$
  - *depth*: distance from starting node
  - *concept*: weight of the node itself, depending on the type of the concept or resource
  - *relation*: weight of the edge of the path to the node
- Algorithm expands nodes with an evaluation value above (configurable) threshold only
- Termination: no more nodes to examine, or (configurable) maximum search depth is reached

# Social Filtering

- Extend the information search by including parts of the information space of other users
  - User share parts of their ontology with co-workers
    - E.g. organizations, persons or projects
  - Inquirer inserts ontology parts of another user into her own model
    - Protocol for information exchange
      - Locally in physical neighborhood, e.g. via Bluetooth in a meeting
    - Search algorithm utilizes additional relationships
      - Still only own resources as results
- Privacy/access control
  - Users can specify agreement to share information with some other users (contacts in her ontology)
  - Users can label nodes in ontology as „socializable”

# Social Filtering – Example

- Part of other person's ontology tree is virtually inserted



# Conclusion

## • Summary

- Semantic management and retrieval of resources in PIM
- Semantic Desktop idea for Windows Mobile 5/6 PDAs
  - Recommender implemented
  - Social recommender work-in-progress

## • Current work

- Hierarchical location model
  - Associate appointments or other resources with locations
  - Associate resources with POI types
- Display resources on map
- Integrate RFID infrastructure
  - „Intelligent meeting room“



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***Questions?***