Interaction with Interconnected Data in Participatory Processes

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Summary

Motivation and Challenges

- E-participation is major element of future smart cities
- People engage in *participatory processes*, e. g.,
  formal and informal planning and decision processes
- Smart cities benefit from the knowledge of the masses
- Proper tools needed for participation

Tools
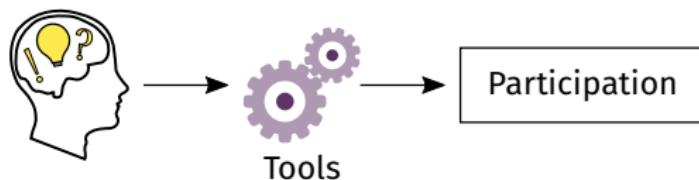
Participation

Challenges

1. Data complexity, e. g., various data types and inherent interconnectedness
2. Understanding users' needs and tasks during participation
3. Interface for presenting and working with the data
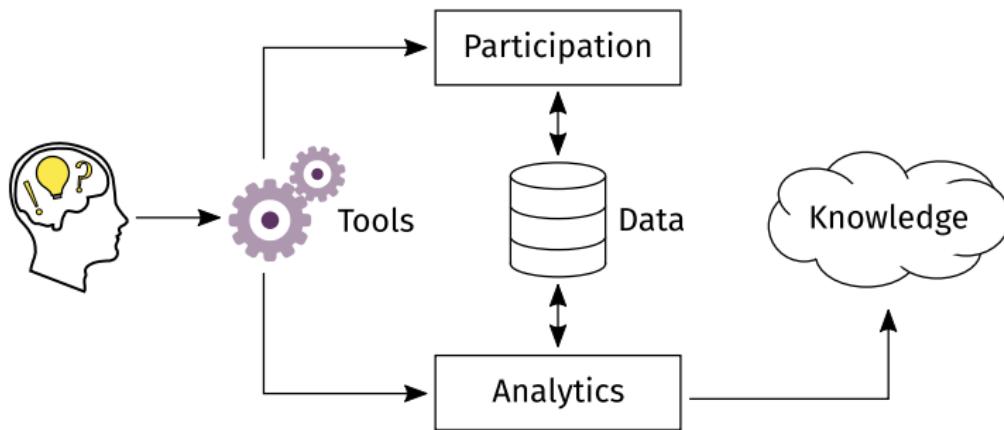
Graph-based Data Model

Data Example

Type	Attribute	Value
Document 🗎	Filename	goals.pdf
Map 🗺	Dataset name	saxony_anhalt_12
Map marker 📍	(x, y)	$(51.746, 11.983)$
	Label	M3
Comment 💬	Timestamp	20160623 T 09:31:01 UTC
	Content	I don't agree. Too expensive!
Image 🖾	Size	88 KB
	Dimensions	1363×667
Rating ♡	Author	Joe Blow
...	...	...
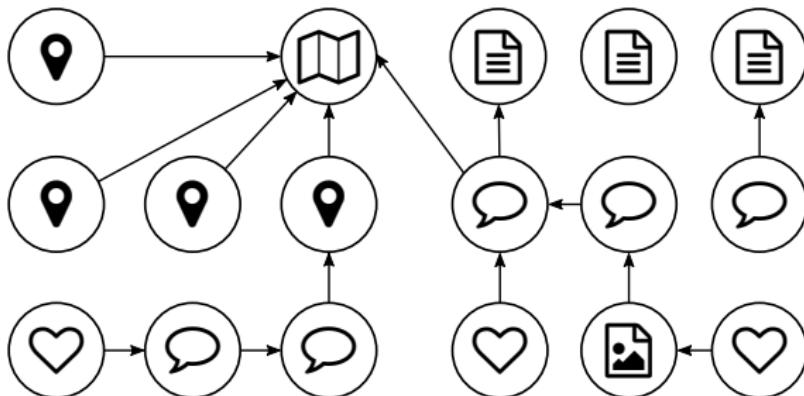
- Graph $G = (N, E)$ with N set of nodes and E set of edges
- $n \in N$ is a specific entity with arbitrary attributes
- $e = (n_1, n_2) \in E$ is a directed relationship with $n_1, n_2 \in N$

Graph Creation

Two main approaches for graph *initialization* and *evolvement*

1. Automated or semi-automated methods
   - Regular expressions for matching patterns, e. g., textual references like "§ 437 BGB" (German Civil Code)
   - Information extraction and coreference resolution algorithms, considering natural language text, e. g., "I received your letter from last Monday"

2. Manual, interface-supported interaction
   - User-driven control mechanism for error correction
   - Create and connect new contributions to existing data

Interaction Tasks

Data Exploration

Category	Subtask
Explore	Inspect online
	Download data
	Scroll content
	Directly navigate
	Pan or zoom views in GIS
Select	Select / deselect single content
	Select / deselect multiple content
Reconfigure	Sort items
	Enable / disable layers
Abstract	Examine / hide details
Connect	Combine information
Filter	---

Category	Subtask
Compose	Write text
	Style text
	Attach data
Add	Send data
	Save draft

Graphical User Interface

Overall concept
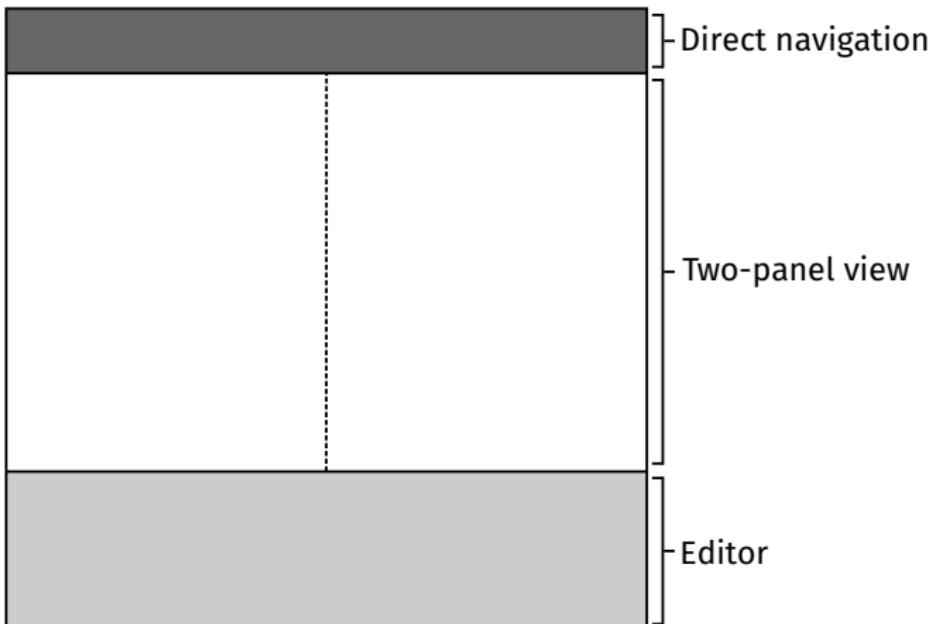
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Direct navigation area

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Comments — Filter | Sort by ● Date ○ Author

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Summary

Final Remarks

- E-participation produces complex data
- Graph easily describes different entities and relations
- Data exploration and editing tasks are foundation for interactions
- Conceptual idea of a graphical user interface for participation is currently in implementation phase

Thank you very much!
Questions?

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