Innovative approaches to urban data management using emerging technologies

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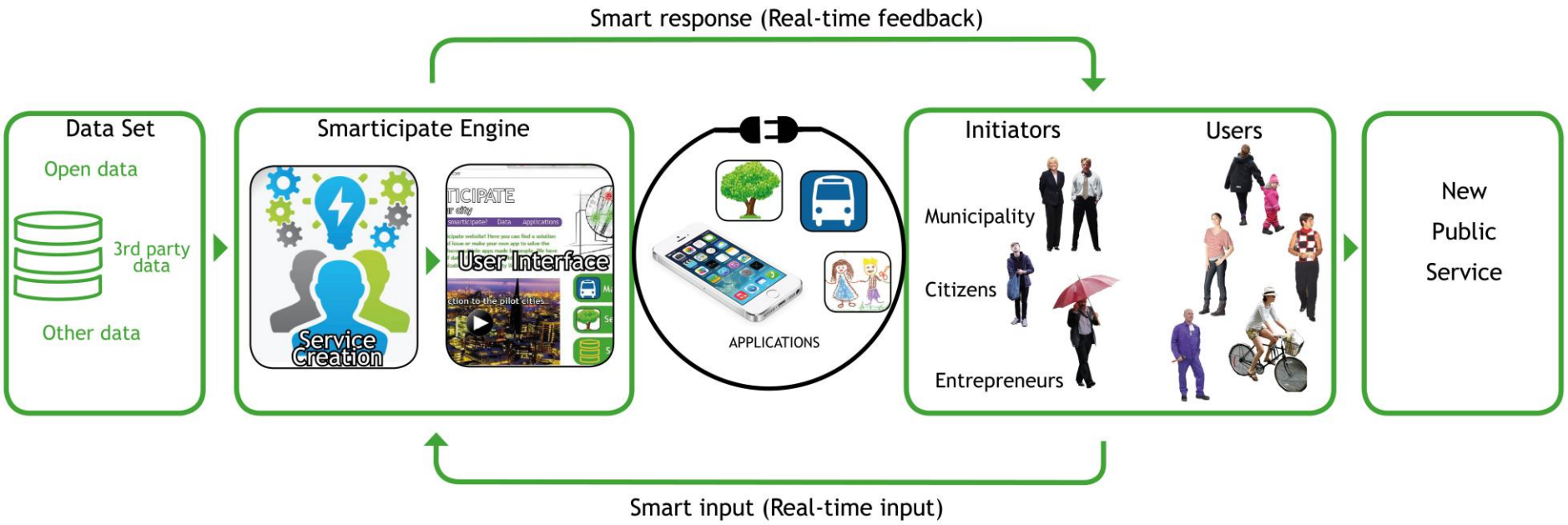
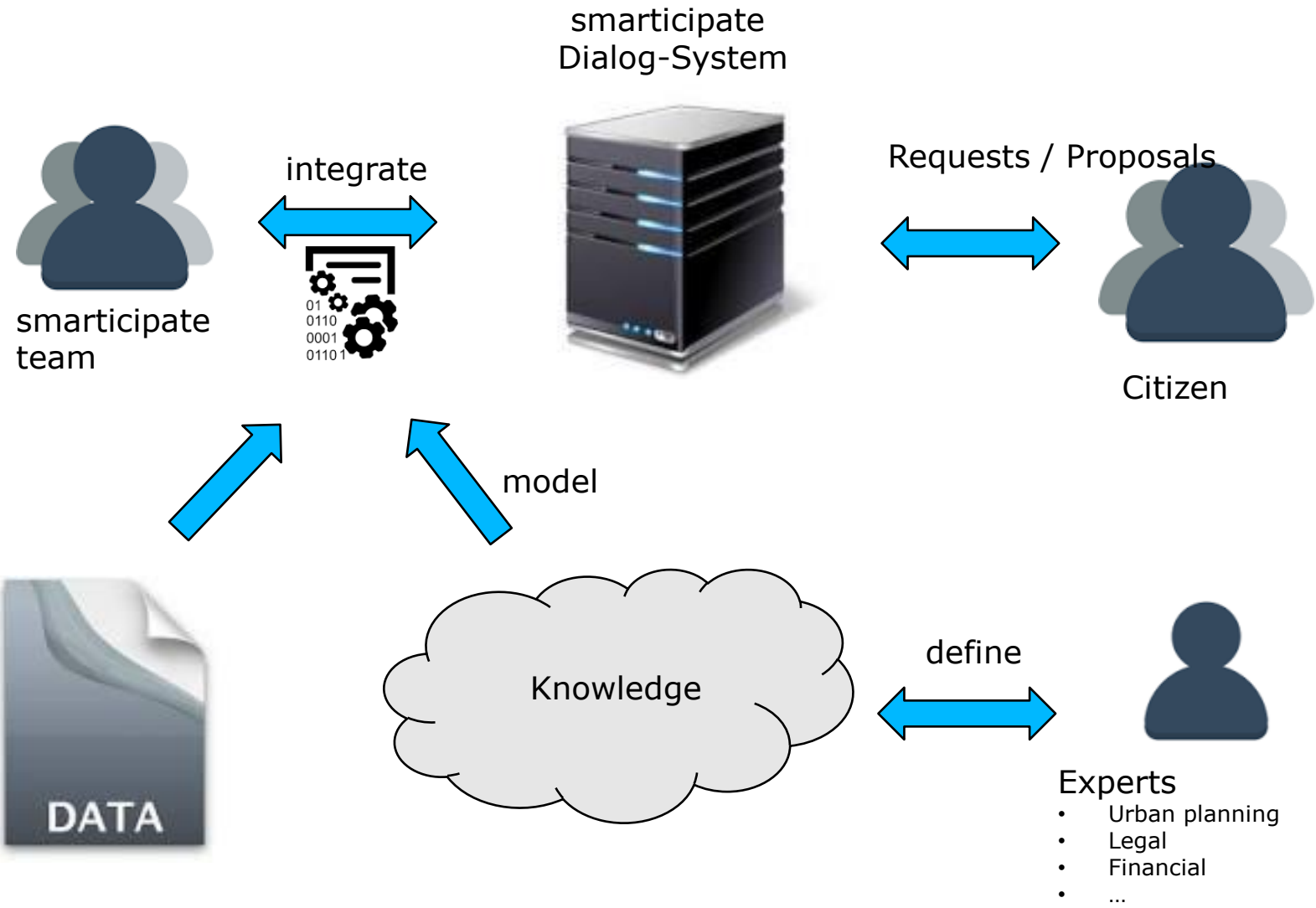
smarticipate

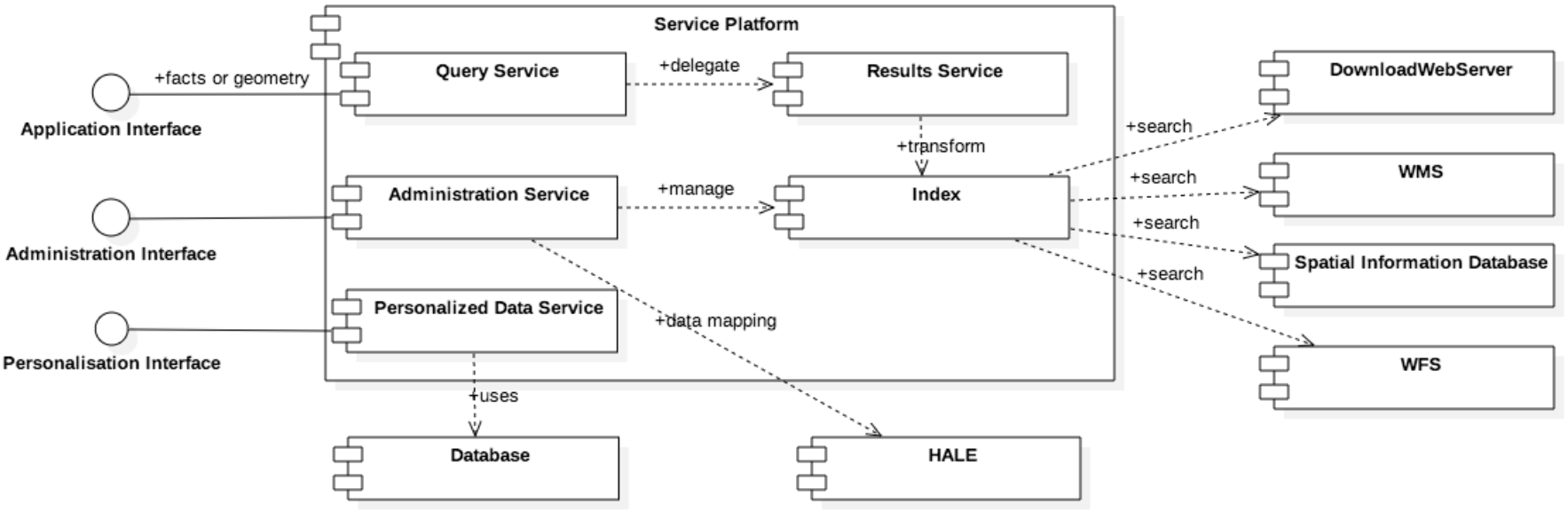
- Key features of project
  - Bottom-Up approach for involving citizens in planning, leveraging creativity, have their say
  - Extensive Piloting with the cities Hamburg, London and Rome
  - Continuous, iterative process
  - Interdisciplinary collaboration in project
  - Services also from citizens for citizens
- Goals:
  - Make open data available in a more useful way
  - Support structured dialogue between stakeholders
  - Support Impact Assessment by visualization and calculation of consequences

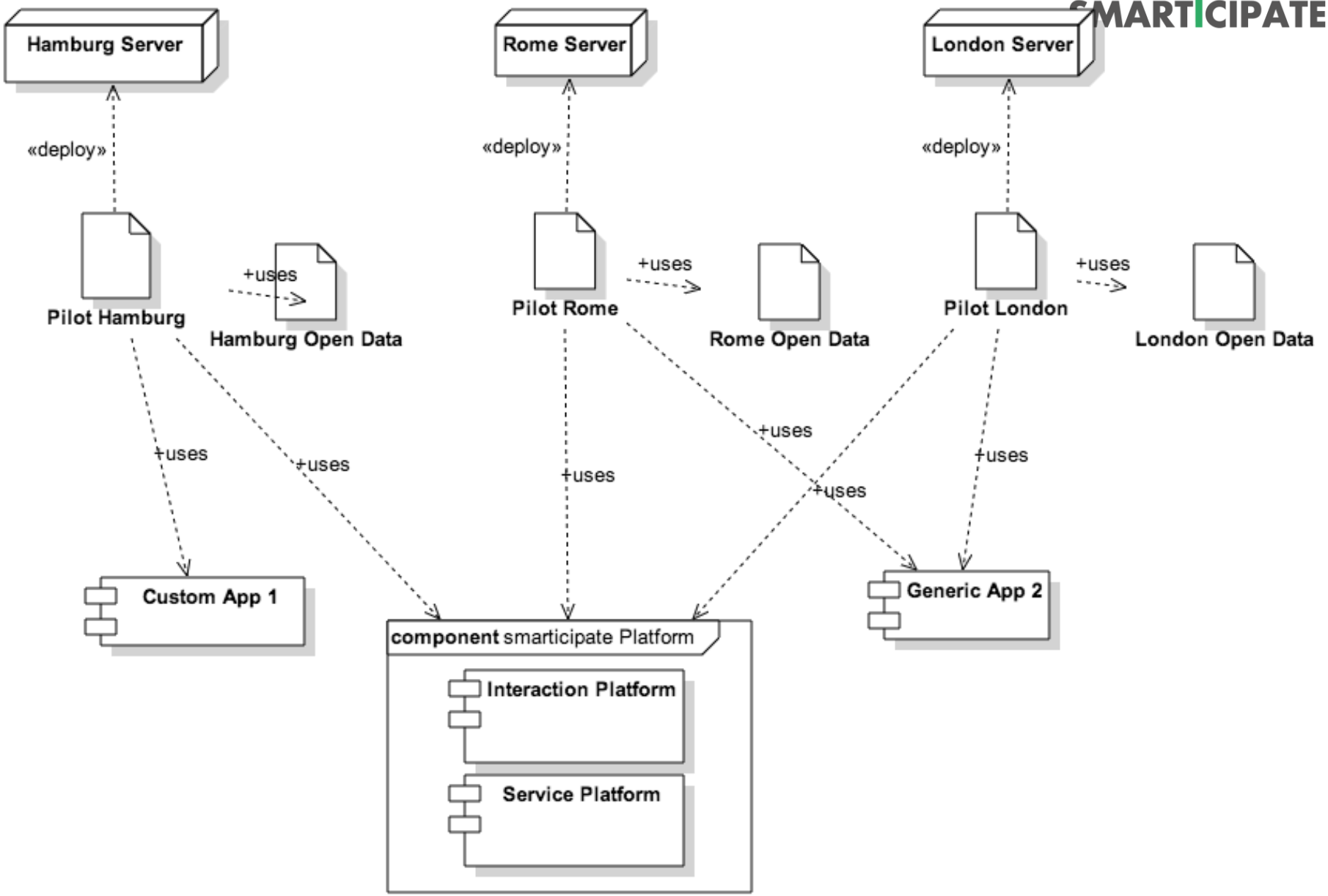
smarticipate



smarticipate







Data?


NEW CUYAMA
Population 562
Ft. above sea level 2150
Established 1951
TOTAL 4663

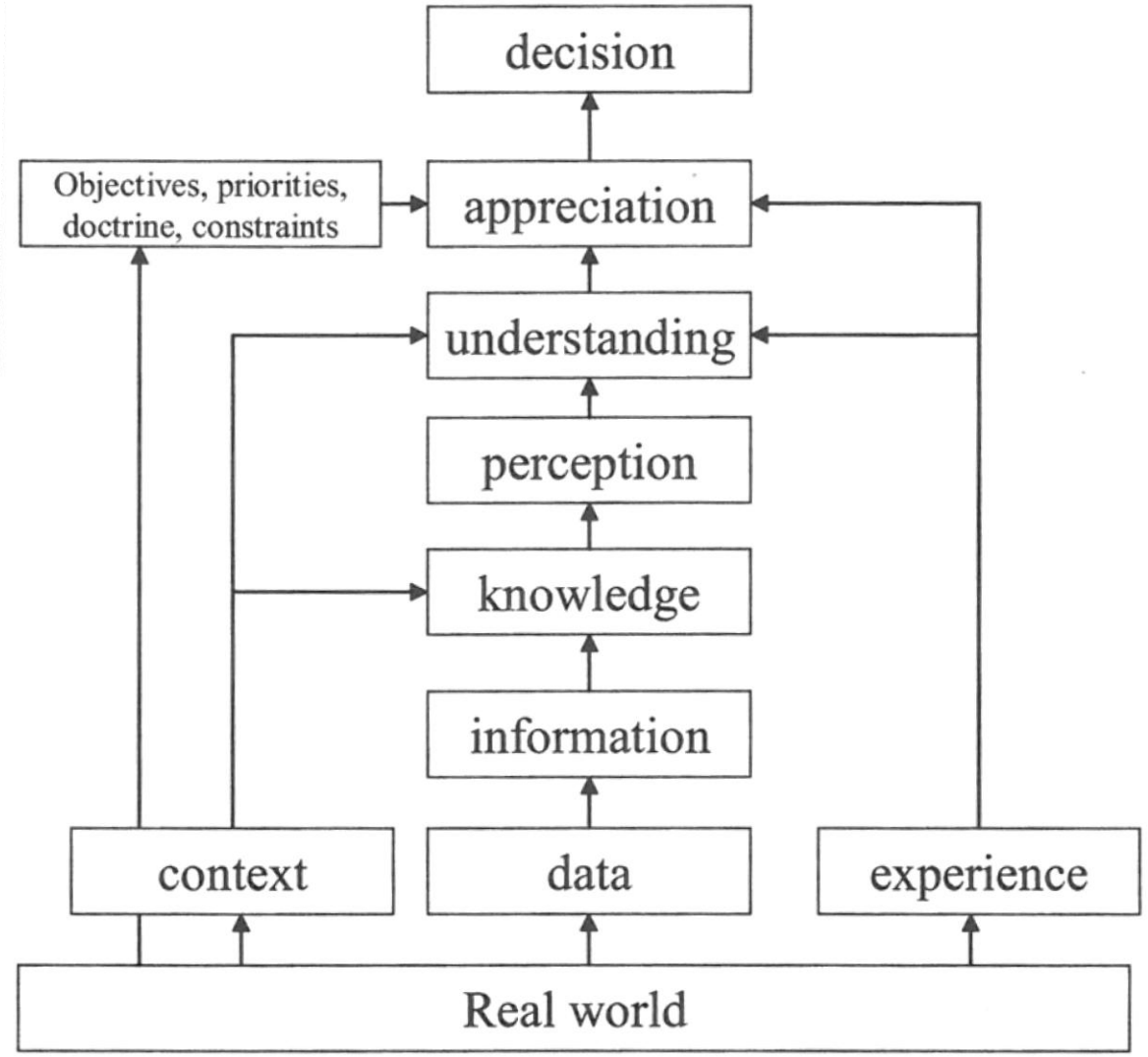


Figure 15. A new view of decision making (based on Marsh, 2000)

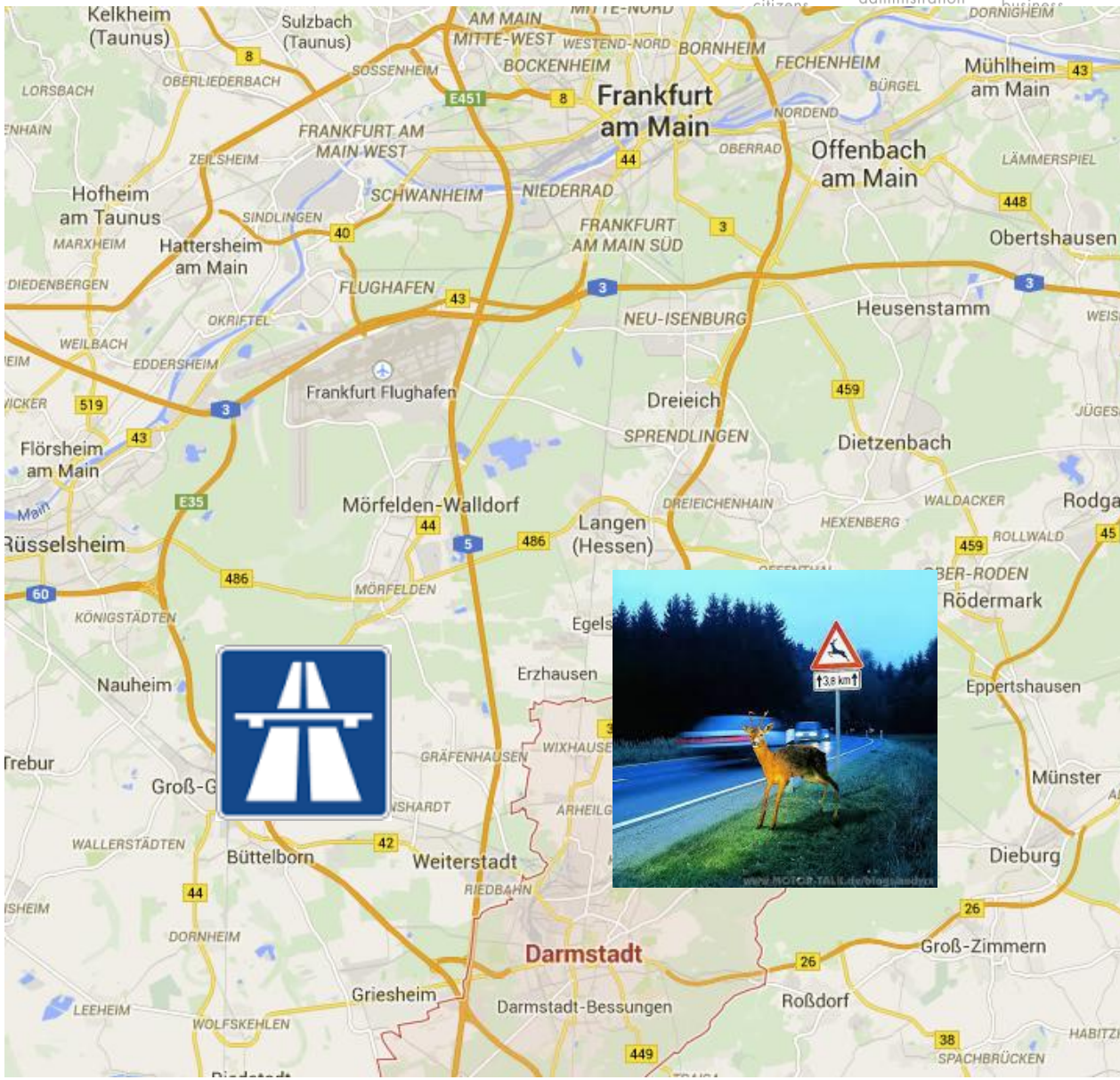
Assessment Problem

Different views

Streets can be

a. connectors of cities

b. barrier in an habitat



Approach

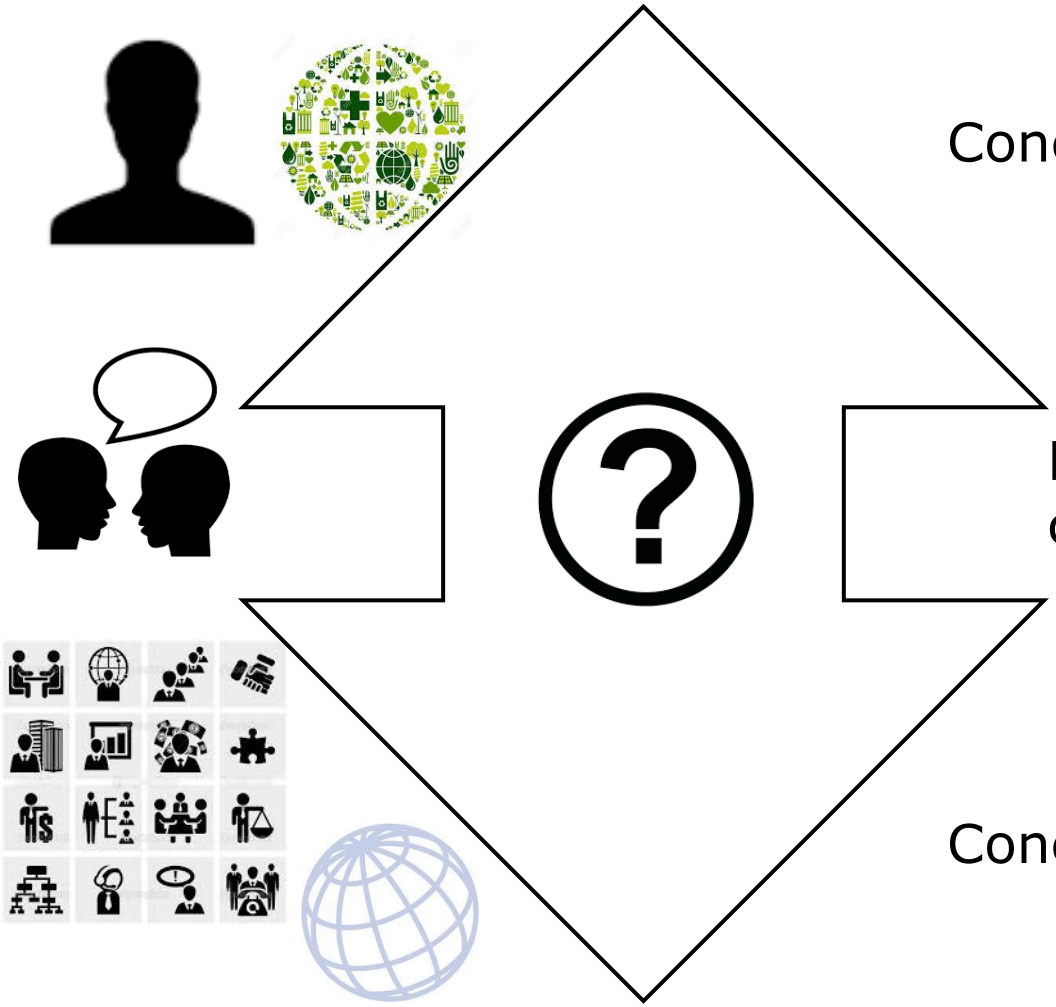
Hypothesis:

Impact Assessment is the interpretation of entities and their relationships in a context.

- Interpretation: connecting to already known concepts or sensations
- Relationship: interactions, dependency, influence,…
- Context: Several dimensions
  - Socioeconomic
  - Cultural

The whole process should be ***use case driven*** and easy to use

Public participation from the cognitive science view



Conceptual Level of laymen

Dialogue to get common understanding

Conceptual Level of experts

Public participation from the cognitive science view

- Meeting of Minds
- Visualisation
- Models for semantics
  - Symbolistic model
  - Conceptual model
  - Connectionist model

Problems with concepts

Vague definitions!

What is a mountain?

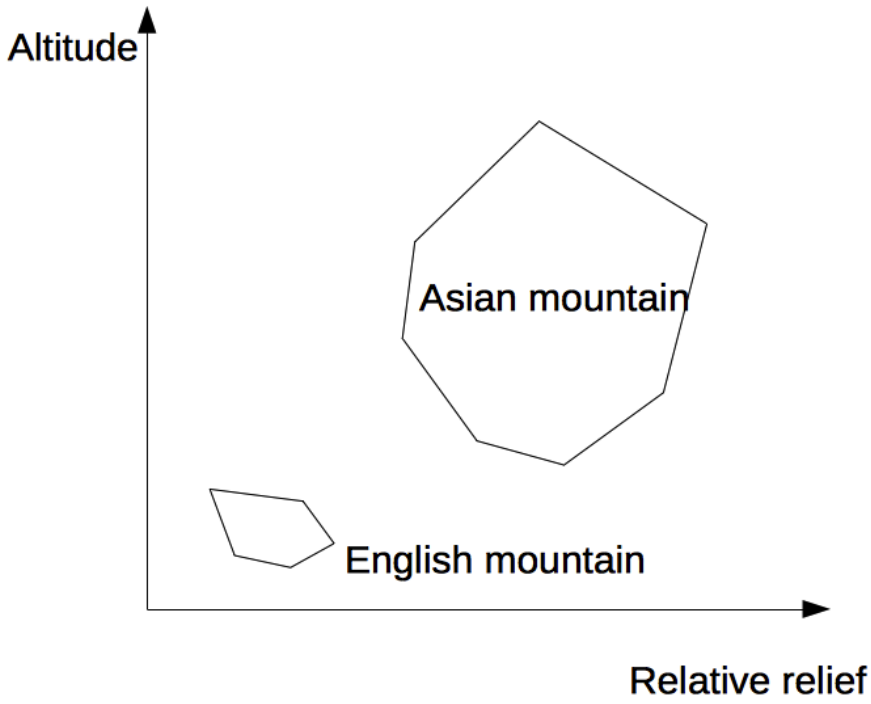
Not a question of being itself

but being in a context

IGD_Folienvorlage_v2010.10.ppt

Conceptual Spaces

- Get Semantics grounded by observable properties
- n dimensional space of properties
- Each entity is a point in this space
- Concepts emanate as clusters in this space
- Work with known geometry methods
- Prototypes of a concept can be defined easily



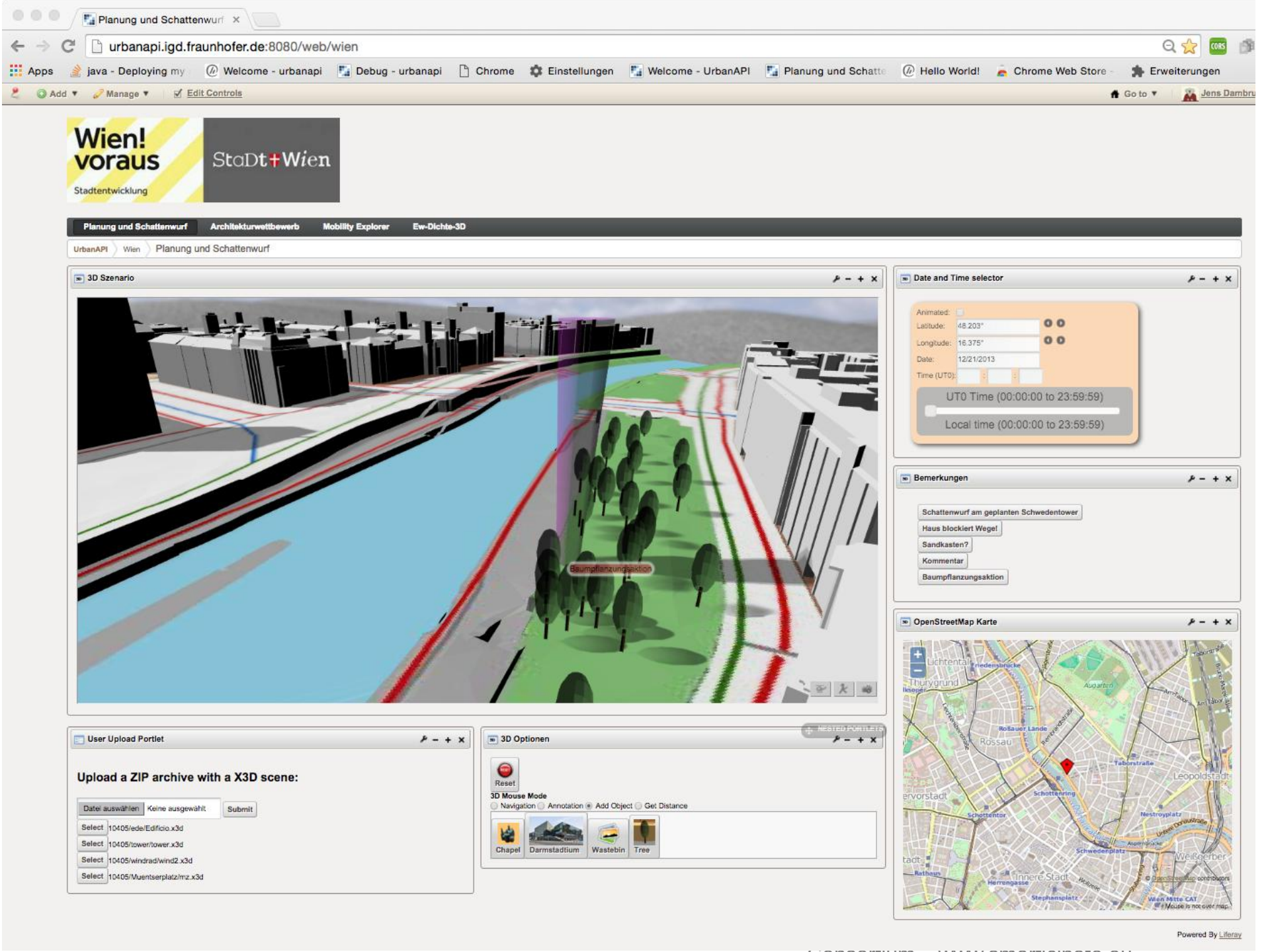
Source: Adams and Janowicz 2011

Application

Technology Stack

A collection of technology in question for smarticipate

- Web-based Visualization
- Domain-specific Languages (symbolistic model)
- Semantic Technology (symbolistic model)
- Search engines (symbolistic model)
- Machine Learning (connectionist model)


Planung und Schattenwurf
urbanapi.igd.fraunhofer.de:8080/web/wien
Apps
java - Deploying my
Welcome - urbanapi
Debug - urbanapi
Chrome
Einstellungen
Welcome - UrbanAPI
Planung und Schatte
Hello World!
Chrome Web Store
Erweiterungen
Add
Manage
Edit Controls
Go to
Jens Dambru
Wien! voraus
Stadtentwicklung
StaDt+Wien
Planung und Schattenwurf
Architekturwettbewerb
Mobility Explorer
Ew-Dichte-3D
UrbanAPI
Wien
Planung und Schattenwurf
3D Szenario
Baumpflanzungsaktion
Date and Time selector
Animated:
Latitude:
48.203°
Longitude:
16.375°
Date:
12/21/2013
Time (UT0):
UT0 Time (00:00:00 to 23:59:59)
Local time (00:00:00 to 23:59:59)
Bemerkungen
Schattenwurf am geplanten Schwedentower
Haus blockiert Wege!
Sandkasten?
Kommentar
Baumpflanzungsaktion
OpenStreetMap Karte
Lichtental
Thurygrund
Rossau
Leopoldstadt
Schottentor
Schwedenplatz
Innere Stadt
Rathaus
Stephansplatz
User Upload Portlet
Upload a ZIP archive with a X3D scene:
Datei auswählen
Keine ausgewählt
Submit
Select
10405/ede/Edificio.x3d
Select
10405/tower/tower.x3d
Select
10405/windrad/wind2.x3d
Select
10405/Muentserplatz/mz.x3d
3D Optionen
Reset
3D Mouse Mode
Navigation
Annotation
Add Object
Get Distance
Chapel
Darmstadtium
Wastebin
Tree
Powered By Liferay

Domain-specific Languages

A language on a specific conceptual level – user oriented

- New methods of interaction via language
- Add behaviour and interactive elements
- Needs annotated data
- Bridging the gap to technical concepts like Semantic Web / JSON-LD

Domain-specific Languages

When track A is for bicycle
and A has length more than 50 m
Then display A *red*.

Execute

Data has to be annotated with concepts for this

Outline of automated annotation

Bridging the gap between data and concepts, a topic for research

- Provide target ontology with terms
- Identifiy Dimensions suitable, both for data and ontology
- Define prototype for this ontology
- Create Conceptual Space from data
- Test if prototypes are in correlation with subspaces in the space created
- Link symbolic concept from ontology to data
- Result: annotated data

Search Engines

- Ubiquitous nowadays, simple search by known terms
- Define a query based on user's concepts (Domain-Specific Language again)
- Results are also understandable on a user level
- Context should be exchangeable
- Use annotated data
- Manual annotation of data is reduced, a hard and tedious task

Conclusion

- Bring technology to a user level
  - Hide technological complexity
  - Use concepts from cognitive science to bridge the gap between perception and symbolistic approaches
- Use of standards and existing technology where appropriate
- Embrace heterogeneity