Evaluating the relevance of spatial data in time critical situations

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Structure

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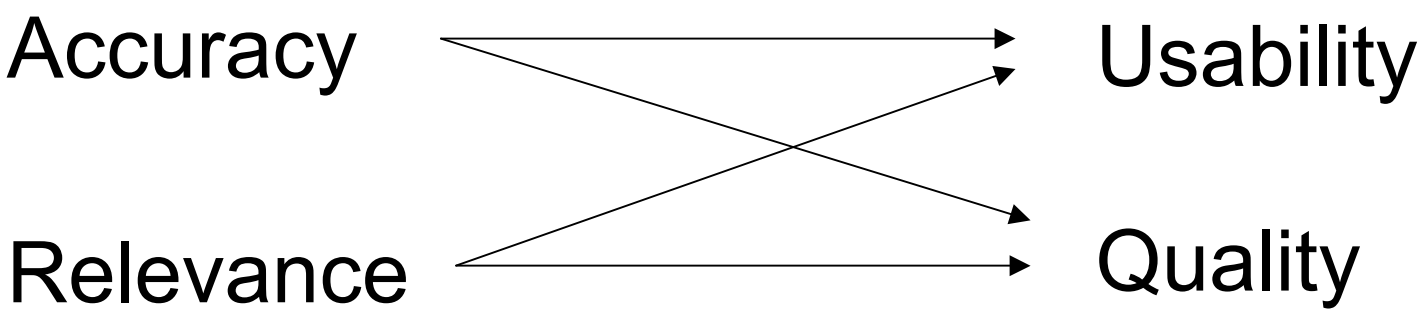
Introduction



Introduction

GIS applications need

- *accurate* and
- *relevant* data

Increasingly, we are confronted with

- *Internet based data sources for GIS*
- *automatic data source identification*
- *automatic data provision*

Introduction

- Research question:
  - *How can we support the identification of relevant, Internet based spatial data sources?*

Need of data in time critical situations, especially disasters

Only one example…

Wearable navigiert im Rauch

Foto: Fraunhofer FIT

Sankt Augustin (rr) – Orientierung im dichten Rauch verschafft Feuerwehrleuten ein Helmdisplay mit Infrarotkamera. Der **Wearable-Computing**-Prototyp des Fraunhofer-Instituts für Angewandte Informationstechnik (FIT) errechnet aus Umgebungsdaten ein Navigationsmodell, das im Display erscheint. Die Forscher im EU-Projekt Wear-IT-at-Work experimentieren auch mit münzgroßen Funkrelais, die in brennenden Gebäuden verteilt werden und Ad-hoc-Netze für die Einsatzleitung aufbauen. Über eng am Körper getragene Wearable-Computer werden zudem biometrische Daten über den Notfallhelfer erhoben, um Lebensgefahren vorzubeugen. Erste Projektergebnisse des **FIT** sind auf der Cebit zu sehen (**Halle 9, Stand B36**).

COMPUTER-ZTG. 07.03.2005

Wearable computer, usable in disaster situations – fire fighting

Data provision for spatial application:
- Which data are relevant ?

Need of mechanisms that support
- Automatic identification of data sources
- data provision for decision making

„Relevant“ data

- Relevant spatial data are those data that support

  – finding an answer for an open spatial question
  – solving a spatial problem

Heterogeneity of spatial data

- Providers of geographic data
  - specify fairly different models for same objects
    - depending on their notion and
    - with regards to their specific application, point of view and
    - understanding of the reality

(Giger and Najar 2003).

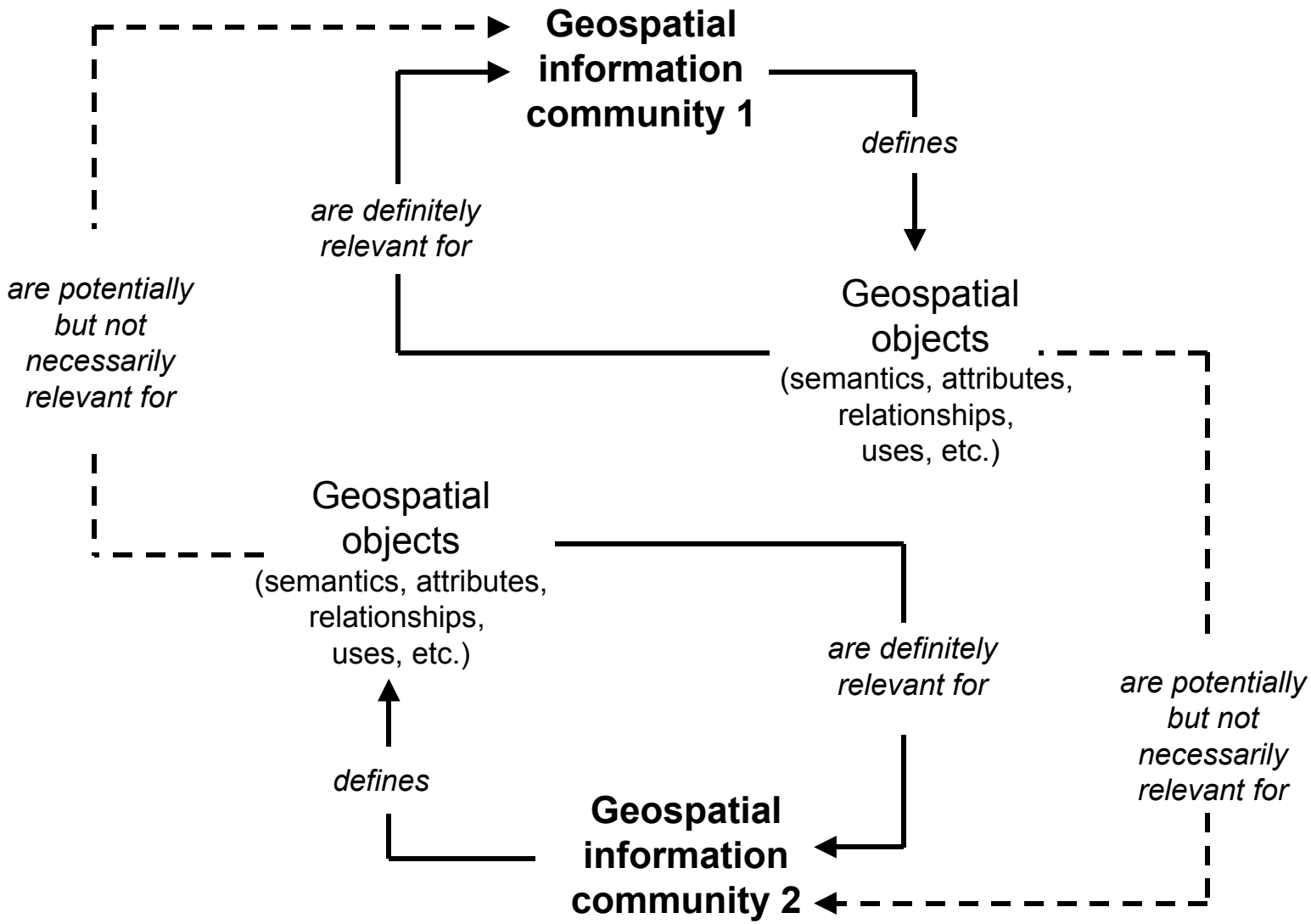
Context-specific semantics

Heterogeneity of spatial data

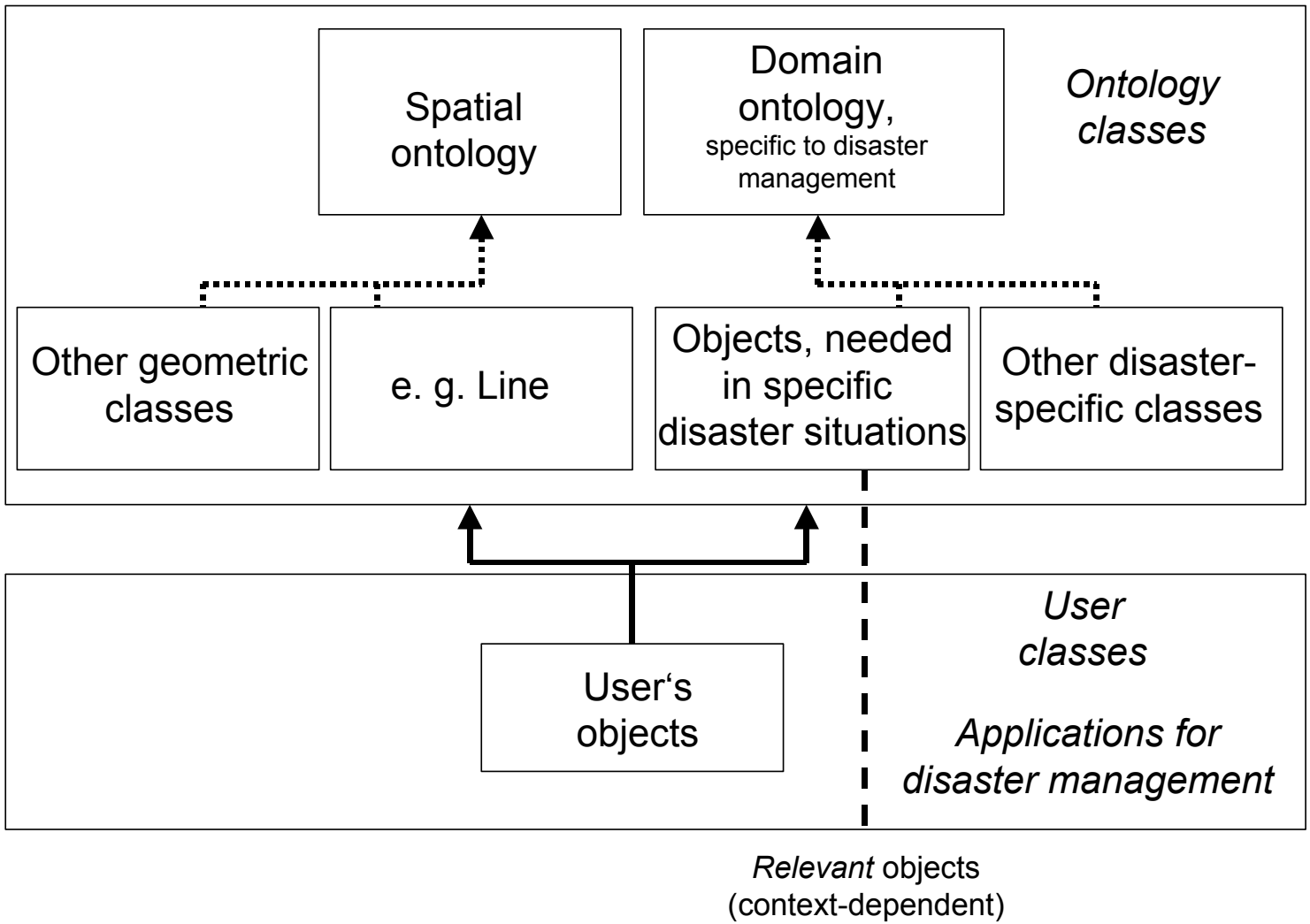
The evaluation of an information concerning its *relevance* requires

- to define the context in which the information is used, and
- to evaluate the relevance of information (only) within this context

Model of relevance



Ontologies



Source: Fonseca, Egenhofer et al, modified

Ontologies to support the identification & evaluation of relevant data

- Ontologies can help to overcome the problems that occur due to (semantic) heterogeneity
- The only way to support information access and sharing is to make data sets understandable for humans, as well as computers.

Ontologies to support the identification & evaluation of relevant data

- In future an increasing number of ontologies will appear,
  - especially *domain ontologies* that capture the knowledge within a particular domain (e. g. electronic, medical, mechanic, traffic, urban and landscape planning, or disaster management).

Conclusions

- Ontologies support intelligent data discovery*, together with metadata, and enable data providers
  - to model spatial data,
  - their properties,
  - quality parameters,
  - relationships, and
  - potential uses
  - ...

* Discovery = identification + evaluation of relevance

Conclusions

– XML grounded and OGC / W3C conformant standard languages such as

- the Geographic Markup Language (GML)
- the Resource Description Framework (RDF)
- the Web Ontology Language (OWL)

enable data providers to formalise ontologies for their specific domains

ISO, OGC, W3C standardization efforts

Thank you for your attention