An Ontology Design Pattern for Spatial Data Quality Characterization in the Semantic Sensor Web

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OUTLINE

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- Spatial data quality

- The pattern

- Benefits/Trade-offs

- Summary

MOTIVATIONS

- The SSN Ontology (Compton et al 2012, JWS)
  - Concepts and relations relevant to sensors
  - Modular

- The OGC SWE (Bröring et al 2011, sensors)
  - Knowledge about quality of sensor outputs is needed and is missing

SPATIAL DATA QUALITY

- Quality: the degree to which a data or service fulfills the needs of a consumer

- Spatial data quality components
  - Vary from author to author
  - E.g.1 Completeness, logical consistency, positional accuracy, temporal accuracy, attribute accuracy
  - E.g.2 Accuracy, resolution, consistency, lineage
  - E.g.3 Accuracy, resolution, consistency, completeness

- Quality: a function of intangible properties of the data considered pertinent to the satisfaction of the consumer's need
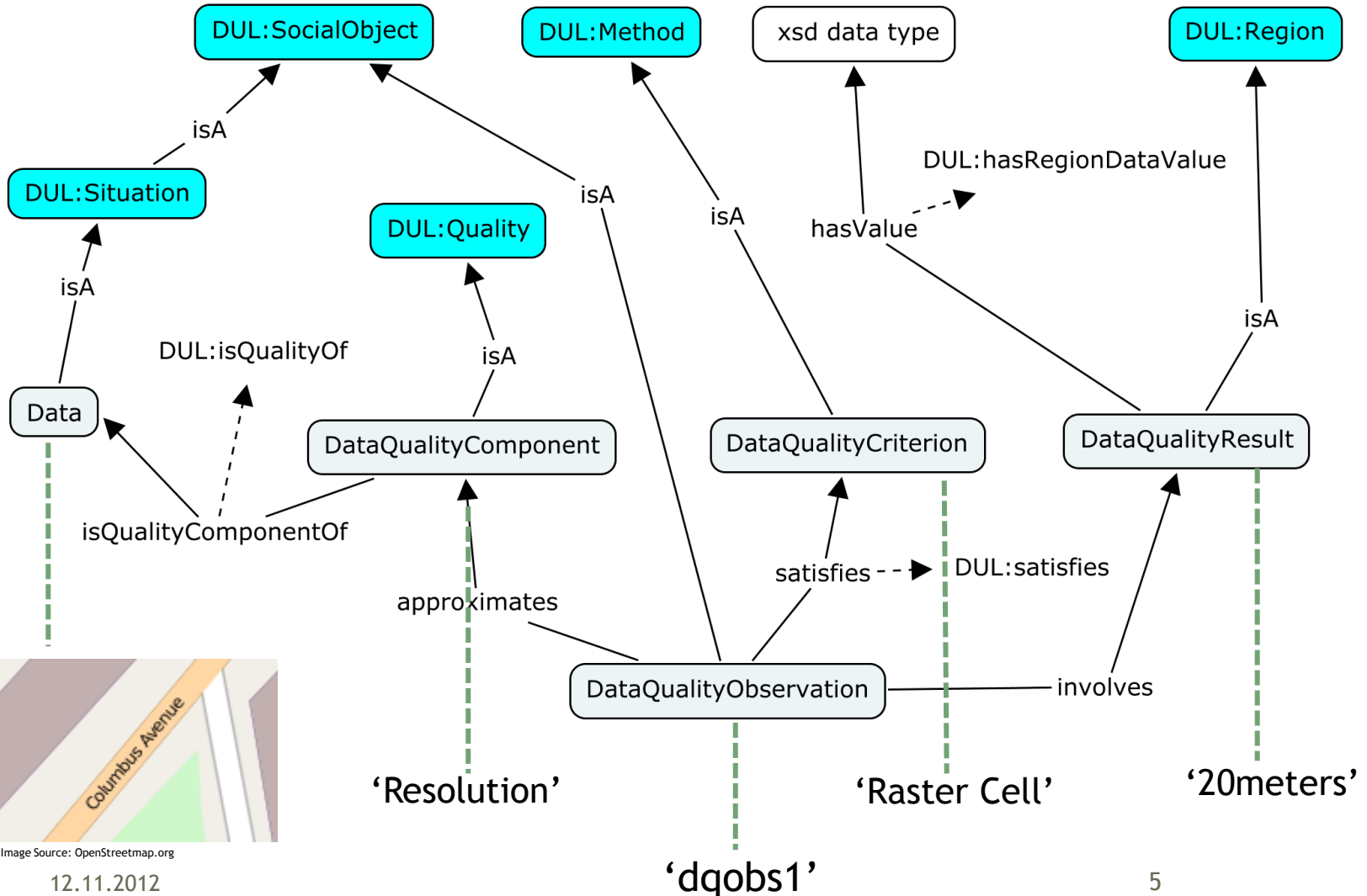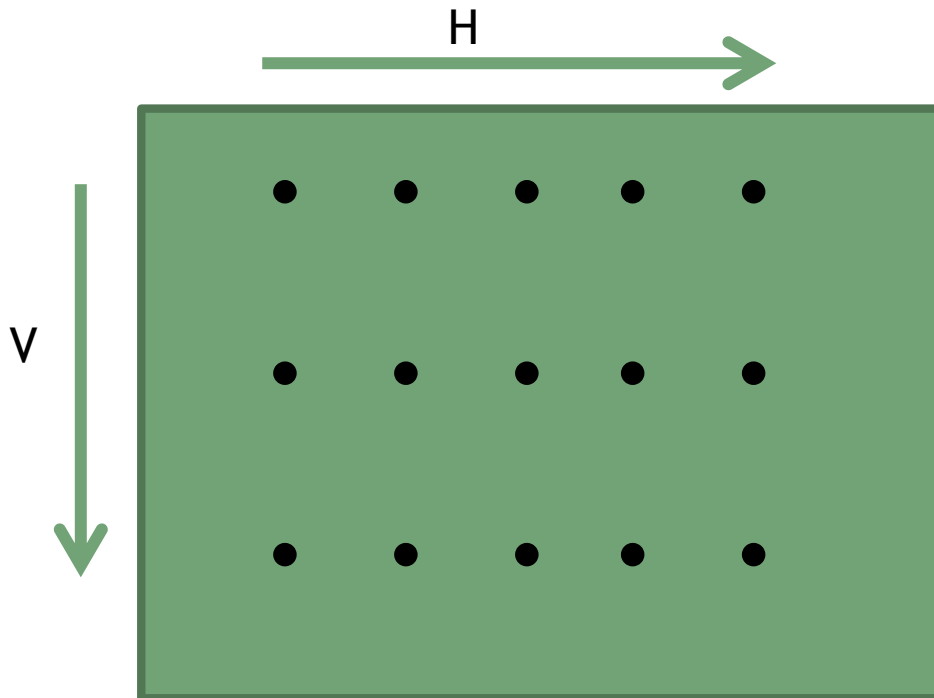
THE PATTERN

BENEFITS / TRADE-OFFS

- Benefits
  - Inference of spatial data component values
  - Detection of inconsistencies when different quality criteria are used for quality assessment

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- Trade-offs
  - The pattern helps only to infer the value of spatial data quality components
  - The user would have to decide if for example 'resolution = 20m' means high/low quality

SUMMARY

- A consumer's view on data quality

- A pattern with 5 elements
  - Data
  - DataQualityComponent
  - DataQualityCriterion
  - DataQualityResult
  - DataQualityObservation

- Usefulness
  - A complementing module to the SSN Ontology
  - Inference of spatial data quality component values
  - Semantic integration of datasets

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- Compton, M., Barnaghi, P., Bermudez, L., García-Castro, R., Corcho, O., Cox, S., Graybeal, J., et al. (2012). The SSN ontology of the W3C semantic sensor network incubator group. *Web Semantics: Science, Services and Agents on the World Wide Web*.

THANKS FOR YOUR ATTENTION!

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