

Depending on the Others: Producing and Using Geospatial Information in Service-Oriented Architectures

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LBS/SOMAP 2014, Vienna



- Geospatial examples of production and modern usage
- Characteristics of the SOA approach
- Management methodologies and toolbox
- Conclusion

# Maps - UI, Devices, Gadgets











[2014] Google GLASS LBS-SOMAP 2014, Vienna | Markus Jobst





# Modern Map Production Key-requirements approaching geospatial infrastructures



- Driving parameters (key requirements) in Modern Map Production are
  - Time/Actuality
  - Accessibility
  - Quality (geometric, semantic, pragmatic)



# **Extended Information Sources**



- Direct embedding VGI in map production workflows; public as a sensor and geoinformation source (unknowingly or actively)
  - Public/user as quality management
    - receiving feeback for quality improvements or
    - observing changes





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- Internet of Things
- Linked Data
- GeoIntelligence





GenelD

Daily Med

Geospatial networks/infrastructures Additional frameworks



- Realtime Visualization of geospatial situations and crosslinked sensors (e.g. traffic, air- and water quality)
  - Apparent scalelessness; smooth transitions between "scales"
  - **Enormous** data amounts





2014 Richter, www.hpi3d.de

LBS-SOMAP http://www.opengeospatial.org/pub/www/files/SensorCollage.jpg



#### **Service-Oriented Architecture (SOA)**?

SOA approach Characteristic/paradigm

# Simplification of

- Publish
- Search and Find,
- Access

(technical, organisational and legal),

 Bind / Use of geoinformation (e.g. for service-oriented map production)







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#### SOA approach Impact

- Decentralized networked infrastructure
- Responsible stakeholders for single system components
- combined stewardship
- Ubiquitous accessibility
- Publishing and maintenance by the responsible provider
  - sharpening competencies
  - reducing/controlling redundancy





# Geospatial obstacles within the SOA approach





LBS-SOMAP 2014, Vienna | Markus J European Spatial Data Infrastructure Network

Overcoming geospatial obstacles within the SOA approach

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- Supranational (apriori) homogenisation of geospatial information preparation
  - Defining/preparing concrete use cases of visualization, Application and Geoportals reports or Internet (TCP/IP even adaptive maps View Download Pan European Data Cache Publication = product definition/ 0 2 Data development Replication Internet (TCP/IP, TLS) HTTP, HTTPS, SAM ownload View NMCA1 NMCA 3 NMCA 2 Transf. Publication Publication Data Production (disconnected) Production Transf. Publication Production Data ransformation Data Production Data

LBS-SOI Figure 12 The E.L.F Technical Architecture

# Quality with SOA/GDI Additional quality considerations/requirements



- Performance and consistency of search- and result delivery
- Performance and capacity of services and data access
- Standard conformity
- Safety and reliance
- □ Availability
- "Freedom for use cases"
  - Support of serendipity effects: generating added values by "free" orchestration of data and services











**Dependency:** a SOA behaviour

 unconsidered system component dependencies (impact on planning and implementation)

- missing/not working system components
  (e.g. based on architecture variations; load balancing; ..)
- system failures
- maintenance downtime









#### Governance of geospatial infrastructure maintenance/development?

# Identification of Requirements

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- Further development of map production automating
  - Process networks of geoinformation- and map production
  - Modified and more efficient concepts of an ongoing change management of the infrastructure components
  - Education: ongoing recreation of trainings and open accessibility



# Evaluating impact and possibilities



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- Measureability of system dependencies (product states, revision cycles, license-, version-, software- and format dependencies)
- Measureability of dependencies of use (dependencies of applications and their use)





Visualization and "decision cockpit" for process and dependency governance

# Visualization



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### only theory?

### Management tools Proof of concept





# Management tools Proof of concept – balanced geo-product scorecard





#### Management tools Product-based process landscape







# 26 conclusion?

# Conclusion



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- SOA approach highly needed in modern map production
- "Dependency on the others" is a main characteristic within SOA
- Appropriate management structures are urgently needed (stewardship, cross-organisational
  - process- and change management)
- Geospatial specific management tool derivations
- e.g.: impact of OGD requirements on evaluation parameters?









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- Geospatial examples of production and modern usage
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- Management methodologies and toolset selection
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