Outline

Goals

Related works

High-level architecture

Directions of collaboration

Conclusions
A new challenge for Ordnance Survey

Growing users need:

To make good quality maps combining their own thematic data with a reference topographic background

Ordnance Survey’s duty:

• A more flexible data delivery
• To provide reference data as a background for user’s data
• To assist map making
On-demand mapping

Definition:

To produce dynamically a tailored map based on user's requirements

- Content
- Scale
- Level of detail
- Symbolisation
- Schema
- Integration need
On-demand mapping

Definition:

To produce dynamically a tailored map based on user’s requirements

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- Integration need

S. Balley - 14th ICA/ISPRS Workshop on Generalisation and Multiple Representation
On-demand mapping

Automatic \hspace{3cm} Manual

On-the-fly \hspace{3cm} Deferred

Collection of user's requirements
Definition of product specifications
Selection of data sources
Content transformation
Enrichment
User data integration
Model generalisation
Symbolisation
Cartographic generalisation
Export

S. Balley - 14th ICA/ISPRS Workshop on Generalisation and Multiple Representation
Our goals

• **Long-term goal:** Full automatic on-demand mapping at a reasonable speed

• **Mid-term goal:** Pave the way for on-demand mapping by proposing a **conceptual framework**

• **Short term goal:** Prove specific components of the conceptual framework through **prototypes**

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Related works

- Collection of user's requirements
- Definition of product specifications
- Selection of data sources
- Content transformation
  - Enrichment
  - User data integration
  - Model generalisation
- Symbolisation
- Cartographic generalisation
- Export

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Related works

Dialogue applications

(Hubert, 2005)
(Christophe, 2009)
Related works

Expert mapping systems focusing on content selection and symbolisation

(Forrest, 1999)
Related works

On-demand mapping systems involving content transformation

GiMoDig
Web architecture for on-demand mapping (Foerster, 2010)
Related works

Ontology-driven enrichment
*(Lüschler, 2010)*
Related works

Extraction of constraints for integration (Stern & Sester, 2011)

Mashup generalisation (Jaara et al., 2011)

Characterisation of user-generated content (Brando et al., 2011)
Related works

On-the-fly generalisation

(Bernier & Bedard, 2007)
(Cecconi, 2003)

Generalisation Web Services

(Neun & Burghardt, 2005)
(Foerster et al., 2008)

Collaborative generalisation (Touya, 2010)
Related works

Schema transformations

(Letho, 2007)
(Balley, 2007)
(Schade, 2009)
Related works

Towards genericity and modularity
- Standards
- Ontologies
- Semantic data modelling
- Semantic web services
- Many existing and ongoing contributions

- A framework for future contributions?

  ⇒ Reusable components
  ⇒ Extensible on-demand mapping systems

- Collaboration needed
High-level architecture

- Knowledge
  - Product design knowledge
  - Procedural knowledge
  - Cartographic knowledge

- Workflow Engine
  - Data delivery services
  - Derivation services

- Dialogue Engine
  - Product specifications

- Tools
  - GIS concepts
  - GEO concepts
  - Operations
Nicholas Gould, MMU:

A workflow management system for on-demand mapping
Collaboration: Sharing resources?

- Derivation services
- Data delivery services
- Product specifications
- DIALOGUE ENGINE
- WORKFLOW ENGINE
- Knowledge
- tool
- tool
- tool
- tool

SEMANTIC REFERENTIAL
Collaboration: Sharing models?

Standards

- Data delivery services
- Derivation services
- Product specifications

Knowledge

WORKFLOW ENGINE

DIALOGUE ENGINE

Ordnance Survey
Collaboration: Sharing a semantic referential?

- Knowledge
- Data delivery services
- Derivation services
- Product specifications
- DIALOGUE ENGINE
- WORKFLOW ENGINE

COGIT laboratory

Tools:
- tool
- tool
- tool
- tool

Automatic speech recognition (ASR) capability
Motorway

Definition

A major classified road, and associated approach road and slip roads, consisting of separate carriageways with separate flow directions, the carriageways are partitioned by barriers.

Back to Geo Concepts

Motorway

- Proposed by: SB
- Proposed on: 04/05/2011
- Definition source: OS RWO Catalogue
- Similarity to source: identical
- Scope: first use case
- Status: first draft
## Scale range

Minimal and maximal scales defining the domain of "relevant use" of a digital product. We could use as a reference the six scale ranges defined by the Multi-Resolution Database Programm at Ordnance Survey.

<table>
<thead>
<tr>
<th>Detailed</th>
<th>around 1:2500</th>
<th>from 1:1000 to 1:10.000</th>
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<tbody>
<tr>
<td>Local</td>
<td>around 1:10.000</td>
<td>from 1:5000 to 1:40.000</td>
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<tr>
<td>District</td>
<td>around 1:40.000</td>
<td>from 1:20.000 to 1:100.000</td>
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<tr>
<td>Regional</td>
<td>around 1:100.000</td>
<td>from 1:70.000 to 1:500.000</td>
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<td>around 1:500.000</td>
<td>from 1:250.000 to 1:2.000.000</td>
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<tr>
<td>International</td>
<td>around 1:2.000.000</td>
<td>from 1:1.250.000</td>
</tr>
</tbody>
</table>

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Conclusions

• On-demand mapping is a long-term goal

• Many projects required

• Agree on a framework now to share contributions later?
Future work

- At Ordnance Survey:
  A demonstrator restricted to a use-case to prove some parts of the high-level architecture.
Future work

Process: adapt road network

- Load road network
- Load user cycling routes
  - Cycling routes
  - Network matching
  - Unmatched cycling routes
  - Network matching
  - Matched high-resolution road sections
  - Append sections to network
  - Simplify network portions
  - Reclassify attribute values
  - Network geometric alignment
  - Load cycle lanes
  - Cycling routes aligned on road network
  - Network matching
  - Cycling routes sections characterised for portrayal

Generalised road network - Enriched with HR sections
Generalised road network - harmonised lod
Generalised road network - sections characterised for portrayal
Cycle lanes

Process: adapt hydrographic network

- Load hydro network
- Calculate networks intersections
  - High-resolution hydro network
  - Enriched
  - Symbol width for roads and cycling routes
  - Network geometric alignment
  - Load cycle lanes
  - Cycling routes sections characterised for portrayal

Hydro network attraction points
Characterise network sections (with attraction points)
High-resolution hydro network
  - Filtered
  - Generalised

Characterise network sections (identify main sections)
High-resolution hydro network
  - Enriched
  - Generalised
  - Simplify hydro network
Future work

• At Ordnance Survey:
  A demonstrator restricted to a use-case to prove some parts of the high-level architecture.

• Further modeling with our current partners

• Reflect about collaboration modalities

• Enlarge the consortium?
Thank you