

Evolving from automating existing map production systems to producing maps on demand automatically

Nicolas Regnauld

02/08/2007

Content

Cartographic production at Ordnance Survey GB Status and challenges

Research in generalisation at Ordnance Survey Goals, past achievements and limitations

From research to production When does it block?

Our plans to combine short and long term research to bring benefits to the company.

Cartographic products at Ordnance Survey





Cartographic production: current state

Problems faced by production

- Different products use different source data, collected and maintained separately
- Systems (hardware and software) are different in all the production lines
- Software and hardware often obsolete
- Some products are only stored in raster
- Very few links between our main database and our products

=> Lack of flexibility, lack of efficiency, high risks of breakdown.

Project to improve the cartographic production

Objectives:

- Switching raster based systems to vector
- Unified cartographic edition platform
- Use our main database to feed updates to all products

Benefits:

- More cross product consistency (data and style)
- Increase efficiency by avoiding duplicating data collection
- More flexibility for moving staff between production lines
- More opportunities to adapt products for specific needs

Research: the goal

Derive automatically our current products and new custom products from our single database.



Research: achievements so far

• 1:50k project

Prove that we can go a long way towards automatically generating cartographic representations of our data at 1:50 000.

- 1:10k project
 - Specific focus of the project
 - scalability flexibility
 - Interoperability
 - Incremental update

1:50k results



Existing Manually produced 1:50k



Fully automatically produced 1:50k Why so little transfer from Research to Production?

Difference between both contexts: the target quality for the result. Constraint for existing map series: keeping the specifications of the map mostly unchanged: Quality fixed and very high



How can we put research results into production

- Develop a system that generates the current map series automatically from our data.
 - => too much manual edition required, they won't let us do it!
- 2- Develop a system that can automate (partially) the update process
 - => more development than research
- 3- Generate new products. Custom products, for specific needs, lower cartographic quality but more focused.
- 2 and 3 together provide a balanced approach to deliver on the short and long runs.



- Stage 1: creating a 1:25k vector dataset
 - 1. Modelling DCM 25k
 - 2. Populating DCM 25k
 - Production starts: manual update of DCM 25k
- Stage 2: linking 1:25k vectors to base data
 - 1. Modelling DLM mid scales (data required to support mid-scale products)
 - 2. Populating DLM mid scale (links between base data and cartographic representations)

- Stage 3: Automation of processes
 - 1. Automating DLM update
 - 2. Introduce automation in DCM update
 - 3. Derivation of other mid-scale product

Case 3: Research automatic on demand generalisation

Deliver towards what automation can achieve

=> not perfection, but flexibility

Let's allow the quality to be lowered, but keep it under control

Benefits:

- short term: Deliver useful new products, fit for purpose, that would be unfeasible manually (too expensive)
- Long term: Gradually get better systems (richer), that can gradually hit higher and higher quality targets

Key: we need a system that can respond to user requirements and derive a product fit for purpose

System architecture for tailoring on-demand products automatically



Key benefits of this approach

- Conceptual level of the ontologies allow standardisation
 - Of the tools
 - Of the knowledge
 - Of the data model
- Standardisation allows sharing, combining components
- Component approach allows:
 - Future proofing: each part of the system can evolve separately, with technology
 - Continuous enrichment of the system

Work plan

- Define all the components. How do they need to be described
- All the component developed for supporting production projects will be packaged, to enrich the system
- Specific projects will be defined and conducted to prove different aspects of the system
- When the system is rich enough, we will start projects to test and improve the capabilities of the system to respond to user requirements.

Conclusion

Automatic generalisation has more to offer than partially automating existing production lines: it can generate new revenue streams by responding to one-off requests for cartographic products.

To work it needs to be

- fast,
- cheap,
- powerful (can produce wide range of variations)
- provide fit for purpose products

We are developing a framework for building such a system, we need to prove it, populate it, and demonstrate what it can achieve

Why changing the focus

- Have we finished automating our map production processes already?
 - Definitely not
- Is it unachievable?
 Probably not
- Is it uneconomical?
 - Possibly
- Is there a better opportunity for automated generalisation?
 We believe so

Contact for further information

Customer Contact Centre Ordnance Survey Romsey Road SOUTHAMPTON United Kingdom SO16 4GU

Phone: +44 (0) 8456 05 05 05

Fax: +44 (0) 23 8079 2615

Email: customerservices@ordnancesurvey.co.uk

Website: www.ordnancesurvey.co.uk