A TEST FRAMEWORK FOR THE DEVELOPMENT OF COMMON SPECIFICATION FOR A EUROPEAN REFERENCE MAP AT SCALE 1:250.000

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Apart from supplying topographic reference data, the role and task of topographic cartography within a Spatial Data Infrastructure (SDI) is to facilitate the effective and efficient geovisualisation at the interface between SDI and their users and, therefore, adding value to geographic information.

The test framework is part of an applied research aiming at the development of a common specification for a European Reference Map at scale 1:250.000. This visual specification describes the user-specific design parameters in general, content and design concepts.

When implemented, these parameters drive the transformation of geodata into suitable cartographic representations. As a user-oriented process the design is an iterative process performed in close cooperation with the user or user group.

Meaning, when implementing the visual specification it should be possible to test and evaluate several design variants. Finally, the best-suited design variant is selected from the overall empirical evaluation according the 'best practice' approach and realised as a product or service.

The test implementation of the proposed visual specification is carried out to assess the consistency, completeness, and feasibility of the cartographic design.

To support testing and evaluation of several design variants the test environment aims at providing
• 	a technical framework to test the proposed visual specification under real world conditions;
• 	an automated framework to test and evaluate several design variants.

The development of a common specification for a European Reference Map at scale 1:250.000 is based on a use case aiming at providing a common cross-border cartographic representation to promote the cross-border identification and to facilitate spatial planning of the transportation network and therefore supports the multinational collaboration, e.g. within Euregions . EuroRegionalMap (ERM), a pan-European topographic reference dataset, was chosen as the source data offering semantically and geometrically harmonised geodata at the target scale.

SignaTool is a software application developed by BKG to enable a quick visualisation of digital topographic vector data for viewing and quality control. The tool is based on the ESRI ArcMap technology and can be installed as an extension to ArcMap. In SignaTool, the cartographic visualisation is driven by a set of six control files and an ArcGIS style. The SignaTool control files are either DBaseV (DBF) or text (INI) files.

To test the proposed visual specification under real world conditions, the content and design concepts of the visual specification were implemented into SignaTool by setting up the control files and creating an ArcGIS style. First of all, the symbol assignment rules were stored as SQL-

statements in the SELECT table. Secondly, a default value was set up for all attributes to enable a completely automated visualisation.

The drawing order was implemented in the ADO table by assigning a level to each symbol number. To control the labelling of features a labelling expression was defined in the Label_Expression file. Expressions for point features that need to be rotated by a given angle, along a line or around a polygon outline were stored in the ROTATE table. Finally, to avoid small wedge-shaped gaps at the intersection of two line ends SignaTool uses an additional point layer.

 Therefore the symbol number of the line features was linked to the point features in the Finishing file. Further, the symbol library of the visual specification was implemented in ArcGIS using the ArcMap Style Manager. For each symbol in the library an ArcMap symbol was generated and stored according to the geometry type with one or more levels. In addition, Maplex labels were set up to take effect with the Label_Expression and point symbols were defined for the finishing process.

For the test implementation, SignaTool was run on a set of six data samples from ERM. The data samples were chosen representing different geographic regions of Europe. The data samples cover the extent of a Joint Operation Graphics (JOG) map sheet, but are placed randomly to cover cross-border areas.

The resulting maps created (from the six data samples) were examined regarding the completeness and consistency of the transformation from geodata to maps as well as the feasibility of the implementation. A test report documented the main findings and any specifics in the implementation.

The chosen test environment provided a flexible, data-driven technical framework based on existing technologies delivering reproducible results.

The results from the test implementation give a feedback on the definition and design of the topographic reference data in terms of the feature definition, the concept of mandatory/optional features and attributes, as well as the cartographic generalisation, and could be the base for an extended user survey on EuroGeographics' products and services.

SignaTool was chosen as the test environment because the current pan-European dataset ERM is available in ESRI ArcGIS data format. Secondly, the tool provides an automated framework returning reproducible results. Besides, the test implementation for the applied research was used as a test environment for the further development of SignaTool. Both the tool development and the test implementation profited from the mutual feedback.