

Editor:  
Markus Jobst

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# Preface

This book “Service Oriented Mapping 2012” presents diverse aspects of modern map production and geobusiness that were collected during the first Symposium on Service Oriented Mapping from November 22<sup>nd</sup> to 23<sup>rd</sup> 2012 in Vienna. All aspects are related to Service Oriented Architectures (SOA). This conceptual approach SOA helps to model and establish flexible processes. It mainly influences the architectural design of web technologies and has enormous impact on the distribution, production, embedding and user acceptance of modern maps. For instance the last decades of map production with its digitalisation of printing processes, reproduction and map design showed how time and effort can be reduced for the creation of high quality products. In addition new ways of distribution have been established that make accessing and participating in geospatial information much more easy.

Evolving network technologies have enormous impact on the production, use and distribution of maps via the Internet. In general it became easy to access the Internet and leave messages, pictures and geoinformation. Internet maps are mainly driven by the public, but also by national agencies and companies, who use this distribution media in the framework of e-government or publishing. In case of geoinformation and maps, the Internet does not only support the distribution of traditional products, but provides a platform for cartographic web-applications and/or the publishing of geoinformation and map sources.

Distribution and new business models are without question one main advantage for the access to maps. But with the establishment of (geo)spatial data infrastructures (SDI) following the principles of SOA, also map production may be subject to enormous changes and reorganizations. This relatively new paradigm of SOA, which may prevent the collection of geospatial data by others than the data manufacturers (e.g. an external map producer), supports a distributed network of data and functions that should be directly accessed for map production and integrated in the production lane. As result all the embedded data, which of course underlie cartographic procedures represent the latest update directly from the manufacturer.

The idea of SOA for map production sounds great and may help to keep storage requirements low. But before improvidently changing to SOA infrastructures for map production, its use, restrictions and future potential should be explored. Therefore open questions have to be answered and field reports should be exchanged. At the moment different stakeholders, reaching from national mapping agencies to industries, standardisation bodies to NGOs and research institutions to application providers deal with questions of SOA in map production and geobusiness.

The main aim of this book is to highlight a current status of service oriented mapping and its future developments. This aim does not only cover current research, but also field reports, best practice examples and ongoing discussions from all involved parties. Therefore the content of the book may give the impression that it is inhomogeneous in its content and quality and this is true.

Important stakeholders qualified within the double-blind peer review process by an international program committee. The contributions based on varying backgrounds and experiences of participating stakeholders were orchestrated for this interesting topic on “service oriented mapping”.

The book “Service-Oriented Mapping 2012” consists of seven sections with several chapters. 38 chapters all together, which highlight the current situation and experiences of service-oriented mapping. An additional workshop section with 12 lectures, which introduces the reader to webmapping and geo web services. The sections are “Introduction to Service-Oriented Mapping”, the “Diversity of Service-Oriented Map Production”, “Selected Use Cases”, “Advanced Perspectives of Service-Oriented Mapping”, “Geobusiness Considerations and Perspectives”, “Service-Oriented Atlas Applications” and the “Cookbook on Webmapping and Geo Web Services”.

The “Introduction to Service-Oriented Mapping” covers all keynote speakers and delivers detailed reports on the importance of standards as foundation of service-oriented mapping, short term developments and current technologies of maps, applications and tools, the new paradigm for an European geospatial location framework from the viewpoint of a NMA deputy as well as a look at the future of service oriented mapping with the help of current research in augmented reality in combination with mobile mapping.

The section “Diversity of Service-Oriented Map Production” consolidates various basic aspects with regards to service-oriented map production. The chapter on distributed competences and focused resources shows different approaches to service-oriented mapping and explains the main principles of SOA, which require clearinghouses and geospatial process-management methods. The pragmatic approach to the production of an European reference map describes the concept of a reference map and experiences with a test implementation. The chapter on “Service-Oriented Architecture as Tool for Map Synthesis” emphasises the importance of the SOA paradigm for future map production. The web map service performance testing argues a different view of testing a service’s quality and its potential to relieve the strict and formal interpretation of performance requirements. An insight into a service-oriented platform for interactive 3D webmapping illustrates the potential of combined resources within a SOA for cartographic and graphical applications on mobile devices.

The section “Selected Use Cases of Service-Oriented Map Production” gathers various field reports and initiatives that use the concept of SOA. It covers an ongoing project to harmonise geospatial data for a web basemap, a description of joint production efforts in creating a European topographic reference dataset, a report on using PHP and KML for thematic map production, examples of service-oriented maps e.g. crime mapping, experiences in using open source geospatial technologies for the peri-urban development analysis, integration of map services for the living environment and the current state of the European Union INSPIRE geoportal implementation. All use cases have their specific

background and therefore deliver intensive sensibility for the application fields of service-oriented map production. It leads to the question, if there are future perspectives for service-oriented mapping?

In the section “Advanced Perspectives of Service-Oriented Mapping” a selection of current geospatial working fields and prototypes of service-oriented mapping are listed. These considerations reach from a definition of “good design” and effectiveness of web-delivered mapping products to location aware visualization, intelligent GIS, the standardized collection and processing of environmental data, accessing of large archives of earth observations and spatio-temporal visualisation and simulation. All contributions are outcomes and reports of ongoing research at various levels (international, european and regional) of service-oriented mapping.

The given perspectives show the contrasts between current directions of research and pragmatic approaches for geobusiness models. The section “Geobusiness Considerations and Perspectives” is based on successful business models that make use of SOA and supplement the main aspects of service-oriented map production. It covers contributions to non-technological aspects of service-oriented map production, the topic of electronic licensing and procurement as e-business for geoservices, mobile solutions of Swiss Map online and their federal spatial data infrastructure as well as the development of a historical GIS platform and experiences on digital preservation audits concerning digital geospatial data.

Last but not least a section on “Service-Oriented Atlas Applications” lists four examples of atlases that are based on the SOA concept. The Dutch National Atlas in a service-oriented architecture describes the conceptual architecture of embedding the national atlas of The Netherlands in a service-oriented orchestration. The statistical atlases of Switzerland and their atlas content management system explain the detailed information within statistical atlas products and their architecture that serves as a geospatial content management system. The ÖROK Atlas Online presents the Austrian dissemination of spatial development information with the help of service-oriented structures and geoportal applications. The atlas of special education centres in the Czech Republic describes the concept, methods, data sources and the cartographic implementation of the atlas system with modern technologies. The chapter on mapping of drug related statistics with open source GIS establishes ties to the Cookbook on Webmapping and Geo Web Services. It describes how to deploy the content management system Drupal with extensions for online atlas applications. By using UNODC experiences and examples of drug related statistics the mapping modules, creation of maps, adding vocabulary and displaying of maps is explained. An appendix guides through the installation of Drupal.

The scientific and reporting collection of the symposium on service-oriented mapping is extended with a “Cookbook on Webmapping and Geo Web Services”. The intention of the cookbook is to enhance the knowledge of creating modern maps and to introduce to service-oriented mapping using small and un-

derstandable hands-on lectures. The gradual lectures were extracted from the university courses of ITC University of Twente and Vienna University of Technology. The 12 steps start with an introduction to the language of the web (the mark-up language HTML), geo web services and the OSGeo live system version 6.0, which is used as technical framework for the given examples. All software components that are used during the lectures are embedded in this Linux-based operating system. Most components are also available for PC and Mac. Beyond the introduction, other lectures describe how to use OpenLayers as webclient, create data in an open source desktop GIS, deliver data as an OGC web map service, understand the syntax of SQL, use PostGIS and Spatialite and embed PostGIS data in a mapserver WMS.

This compilation of service-oriented mapping and its cookbook will guide you through the current state of “SOA-based Cartography”. At this stage we cannot yet estimate the full potential of service-oriented architectures for map production and geobusiness. From the examples given in this book we can expect evocative improvements and changes based on the paradigm of SOA in the domain of cartography and geoinformation management for the coming years.

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Markus Jobst