
Towards automated mapping in a services environment

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Until recently I was active in the two “old” GIP research themes: I worked on the SDI-light OSGEO software stack, implementing geowebsevice components in a simple, stable and cost-effective setup, using an SDI software stack that is built out of free and open source components. Furthermore I was looking into spatio-temporal geo-webservices. The goal of this was extending WxS and other geo-webservices with time series data output as animated, interactive vector maps. Work was done in bringing the Open Source project RIMapperWMS further by integration of TimeMapper code it (see <http://kartoweb.itc.nl/rimapper/>).

The intention is to go forward with parts of these research matters within the new departmental research theme STAMP (Spatio-Temporal Analytics, Maps and Processing). I want to look further in facilitating the production of (animated) maps from spatio-temporal data to a format suitable for internet dissemination, *automatically* and *directly*. To achieve that, I want to look specifically into the possibilities of the loose coupling of distributed webservices with animated, interactive vector maps. By ‘direct’ I mean that the maps are generated on-the-fly from the data, without conversion or pre-processing needed. This is necessary because the map generation should fit in an interoperable Spatial Data Infrastructure. ‘Automatic’ in currents systems means that the maps are generated from the spatio-temporal data by the system “working by itself with little or no direct human control”. But this automation at present does *not* include the cartographic decisions as to what type of map to use for different data-types and data-instances. The link between data type and visualisation has to be made by a human (the cartographer in Figure 1), setting up the appropriate configuration parameters beforehand.

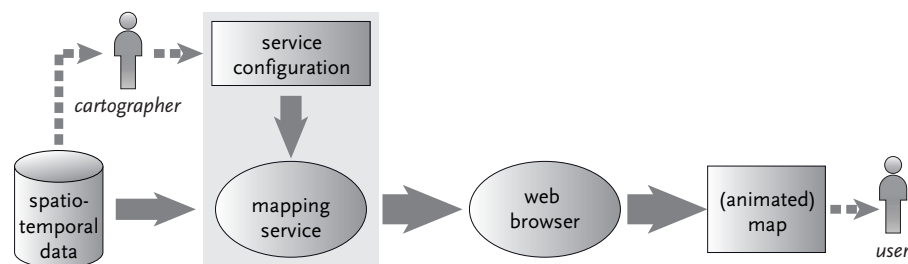


Fig. 1. Current practice of dissemination of maps in a webservice environment.

Fully automated mapping from data, with cartographic design decisions included, remains an interesting research challenge that I want to look into. I have discussed this issue in a GIP research meeting and at the EuroSDR WebCartography workshop. There seem to be several approaches for this problem, a promising one being the use of a *formal map specification language*. This would be a formalised specification (in the computer science sense) that defines the desired outcome using a declarative language. This language should have defined degrees of freedom (e.g. ranges of acceptable values) that allow for map creation in a controlled and consistent manner.

It could be used by a *service compiler* that creates a service configuration file (e.g. an SLD) based on the formal map specification, plus (meta-)data and user input. The possible set-up is sketched in Figure 2.

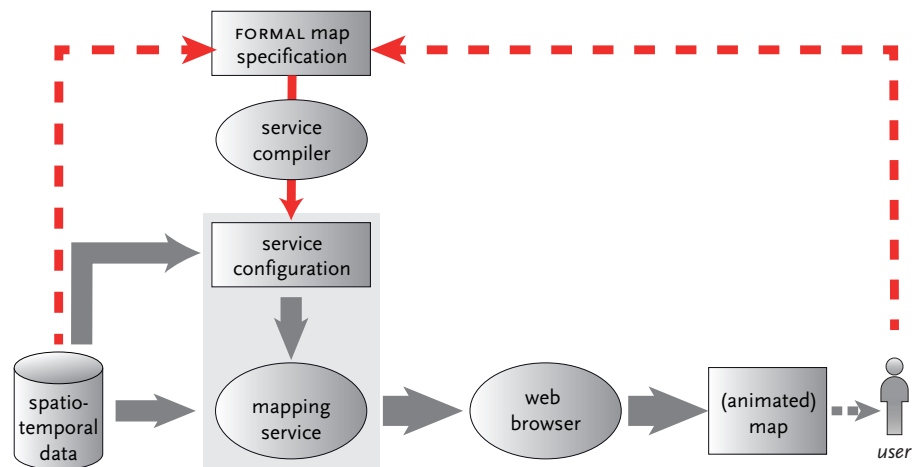


Fig. 2. The possible role of a formal map specification in a webservice environment.

Testing platforms for such a set-up could be the experimental 3rd edition of the National Atlas of the Netherlands (as use case) and the RIMapper/TimeMapper services (as prototype software environment).

The main research question could be formulated as “*can we use a formal map specification language to facilitate, in a distributed webservice environment, the automatic generation of maps from spatio-temporal data in a format suitable for internet dissemination?*”

Keywords: automated mapping; geo-webservices; formal map specification;