

A CONCEPTUAL FRAMEWORK FOR CREATING CARTOGRAPHIC REPRESENTATIONS IN SDI ENVIRONMENT

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The ever increasing demand of our information society for reliable Geographic Information (GI) is the moving power for the development and maintenance of Spatial Data Infrastructures (SDI). Consequently, an SDI works to full benefit of its users if the SDI data collection is accessible and can be efficiently used by all users in spatial problem solving and decision-making. Current development and use of SDI focuses on handling geospatial data entirely by means of information technology. Thereby, low awareness seems to be paid to a user-friendly and understandable presentation of geospatial data.

Based on the understanding that GI is the result of human geospatial information processing, it is argued that cartography is essential in the SDI context in order to achieve the objectives of SDI. Specifically, the paper aims at exploring the concept of user-oriented map design in relation to SDI and elaborating a methodology for creating effective cartographic representations for SDI relevant user types.

First of all, the SDI concept, its objectives and principles are explored as to the human aspect of an SDI using the example of current European SDI initiatives. Secondly, in order to determine the role and task of cartography in the SDI context, the conceptual framework of contemporary cartography is reviewed to provide the theoretical and technological framework for a user-oriented map design. Further, a conceptual framework for creating cartographic representations in the SDI environment is elaborated. The methodology utilises Spiess' concept of the graphic filter (Spiess 2003) as a model for the transformation of SDI data into useful cartographic representations. Besides, the map design strategy by Grünreich (2008) provides the starting point for developing the process of map production. The main tasks are detailed and justified taking into consideration the semiotic-cognitive and action-related concepts underpinning contemporary cartography.

The objective of the map production framework in the SDI environment is to enable users to author their task-specific cartographic representations of geospatial data from the SDI data collection and, thus, to improve the usability of SDI for the end users. That is why it is suggested to distinguish two phases of creating cartographic representations in the map production framework - the design preparation phase and the map production phase. The first phase is concerned with establishing a graphic filter that provides a map design solution for a specific user type and map use context in the SDI context. Map design in the SDI context, first of all, means to establish a graphic filter that determines the parameters and rules of the cartographic transformation process to be applied. It requires on the one hand an understanding of map use, map user and map use situation, and on the other hand insight into the data used as the source. The methodology shows that map design neither is a simple production method nor the last step in the process chain from data capture to visualisation that can be easily automated (Meng 2008, Lilley 2009). Finally established, the map design solution is made available to enable the map production phase.

The research project raises awareness to the human aspect of SDI inherit in its objective to support end users to derive GI and knowledge from the geospatial data gathered in the SDI data collection. It shows how cartography can contribute to the initiation, creation, and maintenance of portrayal services to facilitate a more comprehensive access to the underlying geospatial data. For cartography to take effect in the SDI development and use, cartographic design knowledge has to be made explicit and operational. It is the responsibility of cartographic professionals to prepare the map design that facilitates the access to the underlying geospatial data by means of a user-friendly and understandable graphic interface. The wide range of map use contexts requires a great flexibility of design variants depending on the dimension of human-map interaction. Therefore, the design of the maps needs to be user-driven to enable an efficient map use in the user's task. Besides their function as a graphic interface, maps facilitate a common understanding of the depicted geographic features and phenomena when sharing GI between SDI users. In other words, map design can be regarded a measure to establish interoperability of geospatial data beyond the technical level. The research work is in the scope of communication cartography, a research domain seeking to deepen the understanding of the role of cartographic expressions when understanding and communication of GI is involved.