

“Contribution of Geovisualization to the concept of the Digital City”

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The influence of dimension, abstraction level, and map orientation on generic process and perception of cartographic products of urban areas

The vast amount of possibilities of computer visualizations and the short half-life of digital products have also a strong influence on the generation and perception of cartographic products. Nowadays, GI-Systems enable their users to combine cartographic parameters in a quick and easy way. Therefore, many research projects focus on these technical aspects instead of the question how the parameters of the visualization affect people's perception of the cartographic products. However, in order to generate maps with good usability the research priority should be to study the effects of dimension, abstraction level, and orientation in more detail in order to get more efficient cartographic applications. Commercial providers of digital cartographic information unanimously agree upon the use of dimension, abstraction level, and map orientation as the three most important parameters of their maps. The possibilities to combine and choose these parameters have become a common standard not only for desktop systems but also for mobile devices. This makes it easy for the map users to customize the cartographic output.

In addition to the research of cartographic efficiency for such visualizations three main questions arise:

1. What is the influence of the parameters mentioned above to the process of map generation?
2. How do these parameters influence the human cognition processes? Is it possible to influence these and if so, how is this done best?
3. Is there a way to arouse the interest of a map user and advance the acquisition of information? If so, what are the relevant variations in the selected parameters?

The present project is an interdisciplinary research venture of the Institute of Geosciences and the Institute of Psychology of the Martin-Luther-University Halle-Wittenberg in Germany.

First, exemplarily 2D and 3D maps of a test site are created and subsequently the selected parameters are varied. Qualitative and quantitative empirical analyses test the effects of map attractiveness, spatial orientation and memorizing in a sample of German university students and staff.

The results are integrated in a matrix of the cartographic creation process and influences and dependencies between the chosen parameters are deducted.

On this basis guidelines will be developed that help map constructors to decide on parameter values and facilitate the process of map construction for different types of disposal and design.