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Evaluation of Database Modeling Methods for Geographic Information Systems

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Abstract

We present a systematic evaluation of different modeling techniques for the design of Geographic Information Systems as we experienced them through theoretical research and real world applications. A set of exemplary problems for spatial systems on which the suitability of models can be tested is discussed. We analyse the use of a specific database design methodology including the phases of conceptual, logical and physical modeling. By employing, at each phase, representative models of classical and object-oriented approaches we assess their efficiency in spatial data handling. At the conceptual phase, we show how the Entity-Relationship, EFO and OMT models deal with the geographic needs; at the logical phase we argue why the relational model is good to serve as a basis to accommodate these requirements, but not good enough as a stand alone solution.

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