

## **Integration of the Multi - Criteria Analysis and GIS Development of a Prototype Integrating MapInfo GIS and ELECTRE Methods**

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Nowadays, GIS constitute powerful tools for manipulation, management and spatial data analysis. But one of the fundamental aspects which will assure their pre-eminence in decision making processes, in particular those relevant to territory management and which they are in fact less equipped, is the availability of a set of mechanisms allowing to integrate the decision makers preferences and to make choices in objectives evaluation contexts and conflictual criteria.

Multi-Criteria Analysis (MCA), is one of the responses for compromise alternatives research in complex choices situations as they appear in land suitability evaluation and territory management.

The combination of the possibilities offered by those tools go in the sense of building up a real spatial decision support system (SSDS). To do this, we opt for the integration of the spatial analysis functions of GIS and the MCA methods. Based on SCHARLIG works (1985), methods of outranking (partial aggregation) and more precisely the family of ELECTRE (ELimination Et Choix Traduisant la REalité) procedures are privileged.

In this paper, we show the actual limits of GIS in matter of decision making, and evoke the necessity of MCA procedures integration in GIS. We present conceptual and methodological solutions in view to do this integration. A prototype based on the use of the MapInfo Professional GIS and ELECTRE type of analysis methods is presented and illustrated through an application on a realistic case.

The possibility of functionalities adjunction taking into account fuzzy problems inherent to spatial data and imprecision in interrogation language and request formulation are also examined as possible extension to this work.

Keywords: GIS, Multi-Criteria Analysis, Spatial Decision Support, Territory Management.