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Developing a Spatial Data warehouse in GIS context. Integration a Spatial Data mining Process for analyzing data

Abstract

Geographic Information Systems (GIS) current ones stand out as remarkable tools for the processing and analysis of spatially referenced data. However, they are difficult to use as an efficient decision support tools exploiting this spatial dimension. Their limits are established when it comes to aggregating several multidimensional criteria in the analysis process. This is in a context that approaches based on Data mining, Data Warehouse and "On-Line Analytical Processing" (OLAP) all seem appropriate to better characterize–information related to the territory. The OLAP technology, which combines both bases multidimensional analysis and the concepts of the data mining, provides powerful tools allowing the highlighting inductions and information not obvious by the traditional tools. However, these OLAP tools become more complex in the presence of the spatial dimension. The integration of OLAP with a GIS is the future solution for geographic and spatial information. A necessity for the Developing of data mining of spatial data requires structuring of a spatial data warehouse (SDW). This SDW must be easily usable by GIS and by tools Offered by an OLAP system. The work aims at the development of methods resulting from Analysis more adapted to problems of multidimensional spatial analysis. We present in this paper an application made for generating a SDW from geodatabase, based in a GIS-dominating solution. This work is a part of a project for developing and implementing a SOLAP solution in a spatial data mining intelligent Process. The implementation of the application, we opted for the creation and update of a Spatial Data Warehouse (SDW) comparable to a layer of information in a GIS system. This approach allows us more readability and more efficiency in the validation and implementation of SDW.

Keywords: SOLAP; GIS; Spatial Data Warehouse; Spatial Data mining;

Biography

I am Engineer studies at space technology center, I got a master's degree specializing in geographic information system. I am mainly interested in data mining and spatial olap. I use different techniques of spatial information system and solap. I have ease with data warehouse, and during my work I took a lot of interest in geomatics. In addition, I have been able to use several tools, through GIS software such as ArcGis and QGIS

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Importance of Research

The Geographic Information Systems (GIS) stand out as remarkable tools for the processing and analysis of spatial reference data. They are however difficult to use as decision-making tools exploiting this spatial dimension and their limits are established when it comes to the aggregation of several multidimensional criteria in the analysis process. The quest for performance, efficiency and objectivity requires the use of more sophisticated, faster and above all smarter processes in order to pretend to perform coherent analyzes in a territory of

interest. However, some aspects remain incomplete and require the intervention of more suitable and generalized tools to properly understand their contours. It is in this context that approaches based on Business Intelligence (BI), Data mining, and Data Warehouse and "On□Line Analytical Processing" (OLAP) all seem appropriate to approach information related to the territory. The introduction of these analytical processes into spatial analysis constitutes a major advance in the efficiency and performance of the analysis and therefore the correctness of the decision these are the basic elements for defining a new technique that is Geo-decision-making. Indeed, one cannot apprehend in the same way different fields such as sales management, the choice of an optimal site for a given activity or even environmental management. The methods developed to assess the effectiveness of the measures taken to improve the sale of a product are of limited scope when it comes to diagnosing, for example, the impact of an urban approach in the degradation of the environment. It is therefore imperative to define specific geo-decisional IT more suited to the area of expertise. The geographic (spatial) dimension of information and data is generally the main component of the analytical process. Its integration is often crucial in the performance of the analysis. The work aims at the development of methods resulting from Analysis more adapted to problems of multidimensional spatial analysis. It is a "subject" orientation rather than an approach by criteria. Its objectives are:

- Proposal of specific procedures by theme for intelligent mining of spatial information - Spatial Data Mining.

- Integration of methods in a GIS tool.

- Experimentation on targeted themes.

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