Abstract

On-Line Analytical Processing (OLAP) systems based on Data Warehouses are main working systems for managerial decisions making. Therefore these systems should have quick response time. Several algorithms have been presented to select proper set of data and elicit suitable structured environments to handle the queries submitted to OLAP systems, which are called view selection algorithms to materialize. Some of these algorithms are static and the others are dynamic. Since users’ requirements may change during the run time, we have to consider view materialization dynamically. In this thesis, we propose a new solution for dynamic view selection. We test and verify this solution through a dynamic view management system with new and improved architecture. This system extracts sequential patterns of incoming queries and predicts the next query through three probabilistic reasoning approaches: Conditional probability, Bayes’ rule, and Naïve Bayes’ rule. The proposed system is compared with DynaMat system (a well-known dynamic view management system), Hybrid system (the only dynamic view management system based on probabilistic reasoning approaches and outperforms DynaMat for drill-down queries), and extended Hybrid system (without constraints) through two standard measures which have been used in related works to evaluation. These measures are Detailed Cost Saving Ratio and Cumulative Replacement Count which are the average cost saving to answer input queries and the total number of view replacements in the pool with new selections respectively. Our experimental results show that the proposed dynamic view selection system improves these measures.

Keywords

Data warehousing, dynamic view materialization, OLAP, probabilistic reasoning approaches, view prediction, view selection.