PARIS TECHNOLOGIES

OLAP Terms eGuide

OLAP

(Online Analytical Processing) is the technology behind many Business Intelligence (BI) applications. OLAP is a powerful technology for data discovery, including capabilities for limitless report viewing, complex analytical calculations, and predictive "what if" scenario (budget, forecast) planning.

Alias

An Alias is simply an alternative name used to reference a particular Dimension Member. One of the chief attributes of an Alias name is that it should be unique within a Dimension. In other words, an Alias name must not be the same name as any other member in the Dimension.

Aggregate

Multidimensional databases generally have hierarchies or formula-based relationships of data within each dimension. Aggregation or consolidation involves computing all of these data relationships for one or more dimensions, for example, adding up all Departments to get Total Department data. It has been claimed that for complex queries OLAP Cubes can produce an answer in about 0.1% of the time for the same query on OLTP relational data. The single most important mechanism in OLAP, which allows it to achieve such performance, is the use of aggregations. Aggregations are also built from the fact table by changing the granularity on specific dimensions and aggregating data up along these dimensions during the ETL process.

Child Member

Child Members are members that summarize into a Parent Member(s). It is imperative to note that Child members are not necessarily Detail Members and could also be parents to other members within a Hierarchy. Therefore a child member might be indicated by either the sigma sign (∑) or by the pound/number sign (#).

Cross-Cube Formula

A Cross-Cube Formula, as the name implies, is a formula that can be used to calculate values in a Cube using data that resides from one or more

Cubes; thus, formulas are "crossing" from one cube to another. The use of Cross-Cube Formulas can dramatically improve performance, enabling users to calculate values only for certain Member intersection points and show them in a "standalone" Cube, rather than design a single Cube that performs many calculations across all Member intersection points. A currency exchange cube is an example of a cube that is employed in a cross-cube formula: historic and current exchange rate differential values could reside in this cube, and formula logic from another cube would use them to create ongoing calculations across multiple currencies in another cube.

Cube

An OLAP Cube is a data structure that allows fast analysis of data according to the multiple Dimensions that define a business problem. A multi-dimensional cube for reporting sales might be, for example, composed of 7 Dimensions: Salesperson, Sales Amount, Region, Product, Region, Month, Year.

Cube Formula

A Cube Formula represents a powerful extension of the ability to perform mathematical calculations throughout an OLAP Cube; it allows users to perform all manner of calculations to populate a cell, ranges of cells, even an entire Cube.

Dependency

A Dependency is an area reference that is similar to a reference used in a Cube Formula definition that indicates where calculation results will appear. The quoting and naming conventions that apply to formula result calculations also apply in a Dependency calculation, except that there is no need to specify Detail Members.

Detail Member

A Detail Member is at the lowest level of Members and has no Child Members in a Dimension; it often is indicated by a pound/number sign (#). Detail Members store values at Member intersections which in turn are stored as Fact Data within a Cube. These are indexes of axis points, for both numeric and string values: numeric values can be integers, decimal fractions or a number in scientific notation, while string values may be a combination of letters and numbers not used in a mathematical function. They are otherwise termed as the 'Leaf Members'.

Dimension

A Dimension is a structural attribute of a Cube that is a list of related names–known as Members–all of which belong to a similar category in the user's perception of a data. For example, months and quarters may make up a Months dimension; likewise all cities, regions and

countries may make up a Region dimension. A Dimension acts an index for identifying values within a multidimensional array and offers a very concise, intuitive way of organizing and selecting data for retrieval, exploration and analysis. Dimensions are the business parameters normally seen in the rows and columns of a report.

Fact Data

Fact Data pertains to the data values described by a company's business activities, in accordance with logical Dimensions that constitute an OLAP Cube. Fact Data–whether numeric or string values–exist at the Member intersection points. For example, the number "15" might exist at the intersection of January, Actual, Quantity, Widget6, 2013, New York. In business terms, the number 15 would be understand as the actual sales of widget6 in January 2013 that occurred in New York of.
A Fact Data point in a multidimensional cube might be the aggregation of trans-actions integrated from an RDBMS, or the result of a Hierarchy or Cube Formula calculation, or even a number entered by another means–e.g., a forecast number entered by a salesperson into a planning model.

Hierarchy

A Hierarchy is a systematic way of organizing the Members of a Dimension into a logical tree structure that defines parent-child Aggregation relationships, where Parent Members, i.e., Aggregate Members, correspond to the consolidation of Child Members. By arranging Members of a Dimension into a Hierarchy, not only can the OLAP model calculate the aggregation of Dimension Members, but also mathematical calculations in the form of Cube Formulas can be eliminated since the values for the Child Members will automatically sum up or total to a Parent Member.

Member

Dimension Members are used to identify a data item's position and description within a dimension, and they in turn make up a Dimension. One of the essential characteristic of a Member name is that it should be unique within a database. Within a Hierarchy, Members are categorized into two types: Detail Member and Aggregate Member. In the case of an Aggregate Member, the value is the sum of Details Members that comprise it. Members can also be calculated, often by a Cube Formula. And the value for a Dimension Member could be the result of a data entry: for example, a user entering a budget or forecast number into a planning model.

Meta Data

Meta Data refers to the structure of an OLAP Cube and its multidimensional

elements, including a Cube's Dimensions; the Dimension Members and their Hierarchy structure; Member Alias logic, and; Cube Formulas. Meta Data describes the characteristics of objects used for database architecture and facilitates in searching, management and linking database contents, thereby enabling users to assemble "reusable" database objects

Multidimensional

Multidimensional means having several dimensions or aspects. In the OLAP world, it pertains to the ability to deal with or manipulate views of several Dimensions and look at the data from many different angles or perspectives. OLAP Cubes are therefore considered to be multidimensional, in that they contact data modeled in such a way that users can report, analyze and plan by, for example, the dimensions Region, Year, Month, Sales Amount, Version, etc.

Parent Member

A Parent Member is at the summary level of any number of Child Members. See also the definition for Aggregate Member.

Persistent Calculation

Persistent Calculation is a feature that provides the capability to save specified Cube Formula-calculated data directly to disk rather than requiring the calculation to occur in RAM.

Slice

A Slice represents two-dimensional view of an OLAP Cube that arranges data in a grid, similar to a spreadsheet; a Slice functions much like a report or a query in an RDBMS in that it returns data based on a request for what to see. In an Cube, a Slice can, optimally, be created through drag-and-drop of Dimensions and their Members; optimally, the Slice view will refresh instantaneously.

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