**ORACLE IN-DATABASE SQL ANALYTICS**

Included in Oracle Database 12c is a compelling array of analytical features and functions that are accessible through SQL. These include: SQL to drive enhanced reporting, data sampling features, advanced aggregations, user-defined functions, advanced pattern matching and spreadsheet-like data modeling.

By moving processing inside the database and making it transparently accessible through SQL developers can benefit from increased productivity and business users can benefit from improved query performance across a broad range business-driven calculations.

Oracle's in-database SQL analytics provide the following key benefits:

### Simplified Way to Solve More Business Problems

SQL analytical functions features that are embedded inside the Oracle Database can be used to answer a wide variety of business problems, such as:

<table>
<thead>
<tr>
<th>Business Problem</th>
<th>Analytical Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who are the top ten sales-reps in each region?</td>
<td>Rank</td>
</tr>
<tr>
<td>What is the 90-day moving average of stock price?</td>
<td>Moving Window</td>
</tr>
<tr>
<td>What is the percentage growth of Jan-2013 sales over Jan-2012?</td>
<td>Period-over-period comparisons</td>
</tr>
<tr>
<td>What are January’s sales as a percentage of the sales for the full year?</td>
<td>Compare aggregates on different levels</td>
</tr>
</tbody>
</table>

### Enhanced Developer Productivity

Developers can simplify their application code by using concise, compact SQL rather than creating complex bespoke code inside their application. Tasks that in the past required the use of procedural languages and/or multiple SQL statements can now be expressed using single, simple SQL statements. This simplified SQL is quicker to formulate, maintain and deploy compared to older approaches, resulting in greater developer productivity. The productivity benefits also extend to SQL-literate business users who are now able to write their own reports and workflows and manage their own enhancement requests.

### Increased Performance

By using SQL analytics developers can boost the performance of their applications. The Oracle Database Optimizer is SQL analytics-aware which means it is able to select best execution plan that delivers the best performance.

### Minimized Learning Effort

The declarative nature of SQL helps reduce the amount of effort required to learn Oracle’s analytical features and functions. The design of the syntax for these features and functions either conform to the existing ANSI SQL standards or are in the process of becoming incorporated into this standard.

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**KEY FEATURES**

Developers and business users can leverage a wide range of analytic functionality that they can combine with other SQL constructs and analytical pipelines to gain deeper insights, including:

- Ranking
- Windowing
- Reporting Aggregates
- LAG/LEAD
- FIRST/LAST
- Inverse Percentile
- Hypothetical Rank and Distribution
- Pattern Matching
- Modelling
- Advanced aggregations
- User defined functions
By using procedural-based in-database SQL analytics the amount of time required for project enhancements, maintenance and upgrades can be minimized because more people will be able to review and enhance the existing SQL code rather than having to rely on a few key people with specialized programming skills.

**Standardized Syntax**

Most companies adopt internal standards within their projects to ensure consistency and reusability. Where possible, these companies also prefer to adopt industry standards, such as the ANSI SQL standard, and/or best practices as way to ensure they deliver the most stable and usable projects and applications. Oracle’s SQL analytics conform to the ANSI SQL standard.

Oracle is working with vendors of query, reporting and OLAP products to assist them in exploiting the huge library of analytic functions. Already many independent software vendors are integrating support for the new 12c in-database analytic functions into their products.

**Embedding SQL analytics into applications**

The real power of pushing the processing into the database is that this approach makes the processing and output available to all users. This makes it much easier to support the following types of data warehouse scenarios:

- Need to simplify sophisticated SQL statement for business users
- Create a re-usable processes for ELT workflows
- Create a re-usable processes to embed in operational applications

**Lower Total Cost of Ownership**

With Oracle’s in-database SQL analytics, there is no need for separate analytical servers or special coding in any application. Oracle’s architecture eliminates the need for dedicated hardware systems for analytics as well as the administrative overhead of managing separate systems. The Oracle Database platform is the analytical platform.

Oracle’s SQL analytic functions provide business users and SQL developers with a simplified way to support the most important operational and business intelligence reporting requirements. The flexibility and power of the Oracle analytic functions, combined with their status as international SQL standards, makes them an important tool for all SQL users.

**KEY BENEFITS**

- Enable complex analyses with much clearer and more concise SQL code
- Processing optimizations enable significantly better query performance.
- Simplify access to all data types and sources through common relational environment
- Minimizes need to learn new keywords because the syntax leverages existing well-understood keywords.
- Industry standards based syntax conform to ANSI SQL standard and is supported by a large number of independent software vendors
- Lower total cost of ownership