

An intelligent partnership

Microsoft and Teradata partner to give users better analysis and reporting tools. *by Sam Tawfik*

Picture this: ABC Electronics is rolling out a major advertising campaign for an LCD high-definition television (TV). The featured product is made by XYZ Television Inc., and there is a guarantee of 10 items per store. Four days before the campaign begins, the marketing application detects low stock inventory in a major-market store and sends an alert to the personal digital assistant (PDA) of the store manager, Lisa, who confirms the low stock situation and e-mails Patrick, ABC's buyer.

When Patrick receives the alert, he forwards it to Amy, XYZ's distribution manager. Amy logs on to the partner Web site, set up by ABC, and investigates the potential profitability impact, the delivery status of the TVs and the types of corrective actions that could be performed before the start of the promotion. Amy transfers overstock from a nearby distribution center to the target store, which can now make available the minimum number of TVs advertised in the flier.

These types of enterprise analytics are a top priority for Teradata customers. Teradata's strategy has been to build and strengthen its partnerships with the largest software providers of business intelligence (BI) tools to help customers deliver strategic BI solutions to front-line users. Teradata currently has optimized connectivity to leading BI tools from Business Objects, Cognos, MicroStrategy and SAS.

Additionally, Teradata and Microsoft recently announced engineering and marketing collaboration efforts to integrate and

optimize the Microsoft BI suite of solutions for the Teradata Warehouse. Teradata extends the Teradata Warehouse reach to front-line employees leveraging delivery channels such as Web browsers, PDAs and smartphones. Microsoft delivers the information stored in the Teradata Warehouse to all users enabling the Microsoft People-Ready enterprise.

Teradata Warehouse technology is used by many of the world's most successful enterprises to provide high-performance and reliable data warehousing. Teradata customers routinely leverage the data in their data warehouse to analyze business trends and decide how best to run their businesses. Microsoft offers a comprehensive suite of BI tools to support reporting, analytics and performance management.

Together, Teradata and Microsoft enable joint customers to inject more intelligence in key business decisions executed by all employees, from back-office business users to front-line operational users. The solutions also benefit IT organizations seeking to build and deploy solutions that leverage familiar tools, such as Microsoft Excel, while accessing the detailed business knowledge collected and stored in the Teradata Warehouse.

The Teradata/Microsoft collaboration focuses initially on the integration and optimization of the connectivity between the Teradata Warehouse and Microsoft SQL Server Analysis Services. This enables Microsoft Office 2007 (which includes Excel 2007, the performance and scorecard management tool PerformancePoint Server 2007

and SharePoint Portal Server) access to the Teradata Warehouse. The collaboration will then extend to the rest of the Microsoft SQL Server 2005 components, including SQL Server 2005 Reporting Servers and SQL Server 2005 Integration Services, and will be available later in the year.

Technical solution

The partnership between Teradata and Microsoft benefits users by reporting and presenting (via Microsoft's applications) BI results analyzed with online analytic processing (OLAP) and Teradata technology. The OLAP technology, which is often the foundation for developing and deploying BI solutions, provides multi-dimensional, summarized/aggregated levels of business data stored in what is referred to as cubes. Enterprises use the technology for reporting, analysis and planning for optimizing the business. Cubes consist of a collection of *measures* values, such as counts and sums, and *dimensions* attributes used to define and categorize the measures.

Cubes are designed to optimize performance for dynamic "slicing and dicing" analysis. BI tools offer rich slicing and dicing graphical tools and user-friendly pivot tables, but to provide performance at the speed of thought, typically relational data is replicated and aggregated into a physical proprietary cube file for storage on an OLAP server. The Teradata/Microsoft solution is designed to deliver the best of both worlds by leveraging the Teradata Warehouse as the relational

cube engine or the relational OLAP (ROLAP) engine, and the Microsoft BI tools for front-end user analytics.

Teradata's ROLAP implementation enables drill-through to the relational data while leveraging Teradata Warehouse scalability and predictable response time. The key technology for the ROLAP optimization is the Teradata aggregate join index (AJI), which is a join index that specifies SUM or COUNTS aggregate operations across one or more tables. AJIs require no user or administrator maintenance and are used automatically by the Teradata optimizer, improving the build of the initial OLAP content, and in accessing and navigating the relational data.

Microsoft will deliver BI solutions to all front-line operational employees with the rich BI stack that includes:

> **SQL Server 2005 database technologies.** Integration Services, Reporting Services and Analysis Services provide data integration, enterprise reporting and real-time data analysis, respectively.

> **PerformancePoint Technologies.** These include ProClarity for interactive drill-down and analysis of multi-dimensional data and Business Scorecard Manager for interactive dashboarding and alerting.

> **Office System 2007.** This includes Microsoft Excel client and server.

Microsoft Excel is arguably the most pervasive BI tool in the industry. However, to populate an Excel data set, a BI tool is often used to build a query, access the data and extract the result set to Excel on the desktop.

With the Teradata/Microsoft partnership, users of Microsoft BI tools, including Excel, can easily connect and issue queries directly against the Teradata Database, allowing the data analysis to be processed in Teradata rather than extracting it to the desktop.

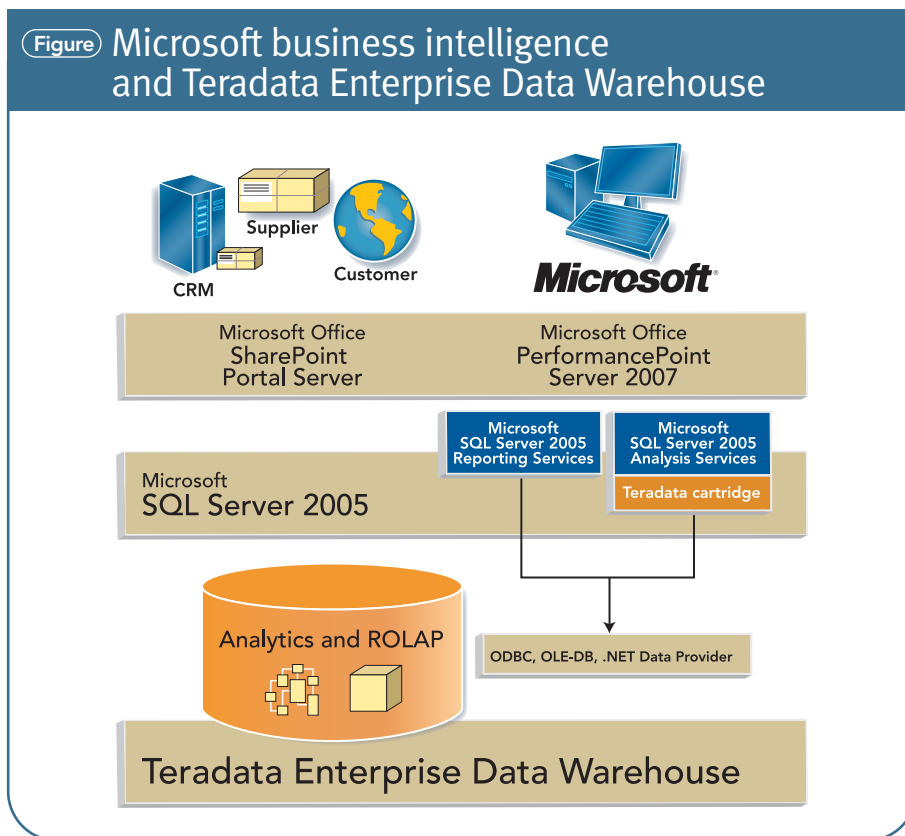
The Microsoft BI solution has been enhanced to ensure high-performance interaction with the Teradata Warehouse. Specifically, Microsoft and Teradata developed a Teradata-specific "cartridge" (or connector) that improves the mapping of metadata from Teradata. This ultimately improves the SQL generation to Teradata from Analysis Services. The Teradata .NET Data Provider (32-bit and 64-bit) is the advocated interface when connecting to SQL Server Analysis Services. (See figure, left.)

Solution implementation

In the opening example, ABC Electronics collaborates with its suppliers by providing alerts to indicate when shipments are predicted to be late. This was made possible through a Teradata/Microsoft vendor collaboration retail solution that enables each partner in the supply chain to detect and monitor critical business events such as delayed shipments. The partners can also access the supporting data stored in the Teradata Warehouse via pivot tables in Excel for further analysis. With this information at hand, ABC determined that items not on the sales floor before or as of the promotional date experienced potential losses. The vendor, XYZ, has placed radio frequency identification (RFID) chips on every pallet that leaves its distribution center so the TVs can be monitored as they move through the supply chain.

ABC, using a Teradata Warehouse as the active repository for RFID data, developed a supply chain intelligence application to provide cross-functional business visibility by showing the actual predicted business impact of a late pallet (considering logistics, sales, point of sale and forecasts).

ABC distributes alerts to XYZ, via a partner portal, about shipments predicted to be



Microsoft SQL Server Reporting Services and Microsoft SQL Server Analysis Services connect to Teradata using ODBC, OLE-DB or .NET Data Provider. Analysis Services leverages a Teradata cartridge for enhanced online analytic processing (OLAP) capabilities. Microsoft Office SharePoint Portal Server delivers the content via the Web or other portable devices to front-line users. Microsoft Office PerformancePoint Server 2007 performs strategic analysis and drill-through.

late. The alerts, accessed via Excel, can be used to display information such as committed promotion date, total pallets shipped, projected late pallets, potential lost sales and potential lost revenue. With this predictive information, XYZ can also drill through to the detailed relational data to track last completed event, next expected event, projected sales floor display date, committed display date, projected days late/early, contribution ranking, daily promotional uplift, potential lost sales and potential lost revenue. XYZ can use this operational information to take immediate action to resolve a potential sales loss. The company can speed up, redirect or send other products to alleviate the situation before it occurs.

The following components are used to deliver this vendor collaboration solution:

- > **Teradata Warehouse.** Enterprise data warehouse containing warehouse-to-
- store detailed business data includes marketing, supply chain intelligence and vendor collaboration applications; Teradata load utilities are used to load real-time data into the data warehouse:
 - **Semantic Layer.** Created to support the vendor collaboration application
 - **Aggregate join indexes.** Created to support the ROLAP environment for the vendor collaboration application
 - **Teradata .NET Data Provider.** Used by the SQL Server 2005 Analysis Services to access the Teradata Warehouse
- > **Supply chain intelligence application.** Custom application designed to capture RFID logs and send them to the Teradata load utility; the application also includes historical and pre-defined business process data to provide predictive analytics such as alerts for late shipments
- > **Vendor collaboration application.** Custom application designed to provide real-time alerts and data to vendors in a secure portal-based partner setting
- > **Microsoft Visual Studio.** Integrated development environment used to develop and deploy the vendor collaboration application
- > **Microsoft SQL Server 2005 Analysis Services.** Analytical engine used by the vendor collaboration application to provide drill-through capabilities to the Teradata Warehouse
- > **Microsoft Excel 2007.** Front-end interface embedded into the vendor collaboration portal used to display and access alerts, as well as the ability to drill through to the detailed data

Partnering to benefit customers

Earlier this year, Teradata and Microsoft announced a working partnership to optimize interoperability between Microsoft business intelligence (BI) solutions and a Teradata enterprise data warehouse to help information workers access, analyze and report on critical data more quickly. The collaboration focused on providing interoperability between the Teradata Warehouse and Microsoft SQL Server Analysis Services, which was released in March 2007.

In addition, interoperability collaboration efforts between Teradata and Microsoft will include SQL Server 2005 Reporting Services; SQL Server 2005 Integration Services; and the 2007 Microsoft Office system including Microsoft Office Excel 2007, Windows SharePoint Services and Microsoft Office PerformancePoint Server 2007.

"Our goal is to enable business intelligence and performance management across the enterprise," says Tom Casey, general manager for SQL Server at Microsoft. "SQL Server 2005 is an integral part of Microsoft's end-to-end business intelligence platform, which enables businesses to perform these types of mission-critical tasks. The seamless integration of the Microsoft BI solution and Teradata technologies provides significant value to our joint customers."

Microsoft SQL Server 2005 Analysis Services is a leading online analytical processing server and provides a fundamental mechanism for surfacing data to other Microsoft analytic and reporting tools. Microsoft applications and tools can access the data in this analytic engine to bring data from the Teradata Warehouse to information workers in the tools they use every day for high-speed, interactive reporting and analysis, as well as more traditional informational reporting.

—S.T.

Combined benefits

The ABC Electronics example demonstrates how joint Microsoft and Teradata customers can develop and deploy BI solutions utilizing the best of both technologies. Teradata already stores and manages the enterprise detailed data and can manage user workload to access and analyze the business data. Microsoft delivers easy-to-use and cost-effective BI tools, such as Excel, that can be used by all employees in the enterprise through convenient delivery channels such as a Web browser, a hand-held device or a smartphone. **T**

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For more information, read
"Thinking outside the cube"
at TeradataMagazine.com.

To learn more about the Teradata/
Microsoft partnership, go to
Teradata.com/Partners/Microsoft.