Bank Leu
since 1755

# Bank Boosts User Productivity 40 Percent, Cuts Implementation Costs 50 Percent

## Overview

**Country or Region:** Switzerland
**Industry:** Financial Services

### Customer Profile

Based in Zurich, Switzerland, Bank Leu is an "independent private bank," part of Credit Suisse Group with a Swiss and international clientele. It has 600 employees.

### Business Situation

With growing data volumes and hardware reaching the end of its useful life, Bank Leu had to upgrade or replace its business-critical financial management accounting solution.

### Solution

The bank chose a solution based on Microsoft® SQL Server™ 2005 Enterprise Edition (64-bit) and created with Microsoft Visual Studio® 2005 Professional Edition.

### Benefits

- User productivity up 40 percent.
- Greater insight delivered to managers.
- Implementation costs cut 50 percent.
- Custom code cut 80 percent.

"Where else can you find a solution having as much functionality as SQL Server 2005 with this price tag? You get it all in one with SQL Server 2005. It's much more than just a database."

Hansjürg Lusti, Business Project Leader, Management Accounting, Bank Leu

Facing massive data growth, longer processing times, and hardware reaching the end of its useful life, Bank Leu, a leading Swiss private bank, needed to upgrade or replace its management accounting system. To enable this highly complex system to keep up with the bank's expanding business, Bank Leu and Microsoft® Gold Certified Partner Trivadis built a solution based on Microsoft SQL Server™ 2005 Enterprise Edition (64-bit) and using Microsoft Visual Studio® 2005. The solution is expected to increase the productivity of management accountants by up to 40 percent, enabling the bank to deliver more insight to users, while reducing data complexity. The solution is only half as expensive as comparable alternatives and requires merely 20 percent of the custom code that would have been needed without SQL Server 2005.

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Microsoft SQL Server 2005
Microsoft Visual Studio 2005

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## Situation

Bank Leu is not only one of Switzerland's leading private banks. It is also Switzerland's oldest bank, recently celebrating its two hundred fiftieth anniversary. As a "private banking boutique" in the globally active Credit Suisse Group, it provides sophisticated financial advisory services to almost 30,000 individual and institutional clients in Switzerland and around the world. Bank Leu's financial products are considered among the best on the market in their categories.

The bank requires an equally sophisticated internal management accounting system to track the performance of each of those products for its clients, as well as the performance of each of its 150 relationship managers and 40 departments.

"Private banking is mainly income driven," says Hansjürg Lusti, Business Project Leader, Management Accounting, Bank Leu. "Each relationship manager's objective is to acquire new assets, which are the basis for generating additional income. We measure each relationship manager and each department manager on key performance indicators. The inflow of new money and income generation are at the top of the list. It figures heavily in our management by objectives."

With so much riding on performance, being able to manage and analyze financial management data is crucial. And with the system having to track the profitability of some 400,000 transactions daily, including its impact on the records of both individual relationship managers and department managers, managing and analyzing that data was also challenging.

Bank Leu was operating its management information system solution with a four-year-old system running on a Hewlett-Packard Proliant DL760, eight-CPU computer that was nearing the end of its useful life and needed to be replaced. The data growth over the previous year had been tremendous, including additional client information that needed to be captured in the data warehouse. This spurred the bank to consider upgrading the solution, which was based on a previous generation of Microsoft® Windows Server System™ integrated server software, including Microsoft SQL Server™ 2000, to the latest Microsoft technologies.

The data warehouse solution relied on flat file data and linked Oracle tables originating in several UNIX-based systems at Credit Suisse. The UNIX-based systems operated the online transaction processing (OLTP) systems for Bank Leu. The data was extracted and loaded into a one-star schema table data warehouse that fueled the creation of 40 reporting tables, each serving a specific purpose for report creation or as a database for ad-hoc analysis. Keeping the data consistent throughout those 40 tables was a major challenge for the bank, because processes conducted on the data in one table would affect data in the others.

Custom code kept the tables consistent, but that code required much of the attention of management accountants and system operators for daily maintenance. Some reports took up to 24 hours to produce—too long when management decisions needed to be based on near-real-time information.

"Transformation and aggregation of low-level data was terribly time consuming," recalls Lusti, "especially when a retrospective view on the organizational structure was applied. We needed to ensure that the incentive reward for assets acquisition and income generation was attributed to the right relationship manager or business unit."

The 500 reports created each month from the 40 tables had as much as 250 values for

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Meinrad Weiss, Technical Project Leader, Solution Manager/Principal Consultant, Trivadis AG

each of Bank Leu's almost 30,000 clients, in as many as 40 different worksheet layouts. Each report was as much as 20 megabytes in size—"Quite heavy," says Lusti. That made the reports a rich source for further data analysis for some managers, while other managers found it excessive and confusing, causing time-consuming requests for assistance from the staff of the controlling department. The reports also created consistency issues of their own, since the bank's management accountants would move the data into their own desktop databases and process it further.

"Keeping complete control of data consistency was an issue nearly every day," Lusti says. "There was no real, single version of 'the truth.' And differences in the data caused us to go back through some of the 40 reporting tables to redo aggregations and transformations. This was sometimes very time consuming and slowed the movement of data throughout the entire chain."

Each year, the bank archived all the data in its operational data store, re-initialized the environment, and began the new year's data-capturing process all over again, without a way to maintain a transitional "sliding window" of data available through the months and years.

## Solution

Bank Leu considered a variety of options to upgrade or replace this solution. Lusti says that off-the-shelf management accounting solutions lacked the features and sophistication that Bank Leu needed, at the price that the bank was willing to pay.

Buying a variety of products—including a separate database plus extract, transact, and load (ETL) tools, and reporting services—to build its solution would have cost Bank Leu additional time and money to set up all the parts of the system. The alternatives also would have necessitated training technicians and users on the separate tools, and maintaining those separate solutions on a continuing basis. "We can't manage a variety of tools with just two developers," says Lusti. "We needed a well-integrated technology with a consistent look and feel to ensure that the learning curve of the developers is steep."

The bank brought those concerns to Trivadis, a Switzerland-based Microsoft Gold Certified Partner with offices throughout Germany and Switzerland. Trivadis helped Bank Leu to re-implement and enhance its solution based on Microsoft SQL Server 2005 Enterprise Edition (64-bit) and, in particular SQL Server 2005 Analysis Services, with SQL Server 2005 Reporting Services and Microsoft Office Excel® 2003 spreadsheet software as the reporting interface.

First, Trivadis Principal Consultant Meinrad Weiss provided Bank Leu developers Frank Uray and Dominic Birrer with customized training on the new SQL Server 2005 technologies. A joint Bank Leu-Trivadis team then designed the new solution architecture. SQL Server 2005 provides the relational storage engine for the data warehouse. SQL Server 2005 Analysis Services provides the online analytical processing (OLAP) engine for the reporting system based on multidimensional cubes that contain the base data, pre-aggregated results, and calculated members.

SQL Server 2005 Reporting Services provide reporting services for a variety of standard reports. In a follow-up phase of development, SQL Server Integration Services will integrate new data sources and move data between the data warehouse stages. The tight integration of these components is a key benefit of the solution.

The use of SQL Server 2005 enables the solution to define calculated members very

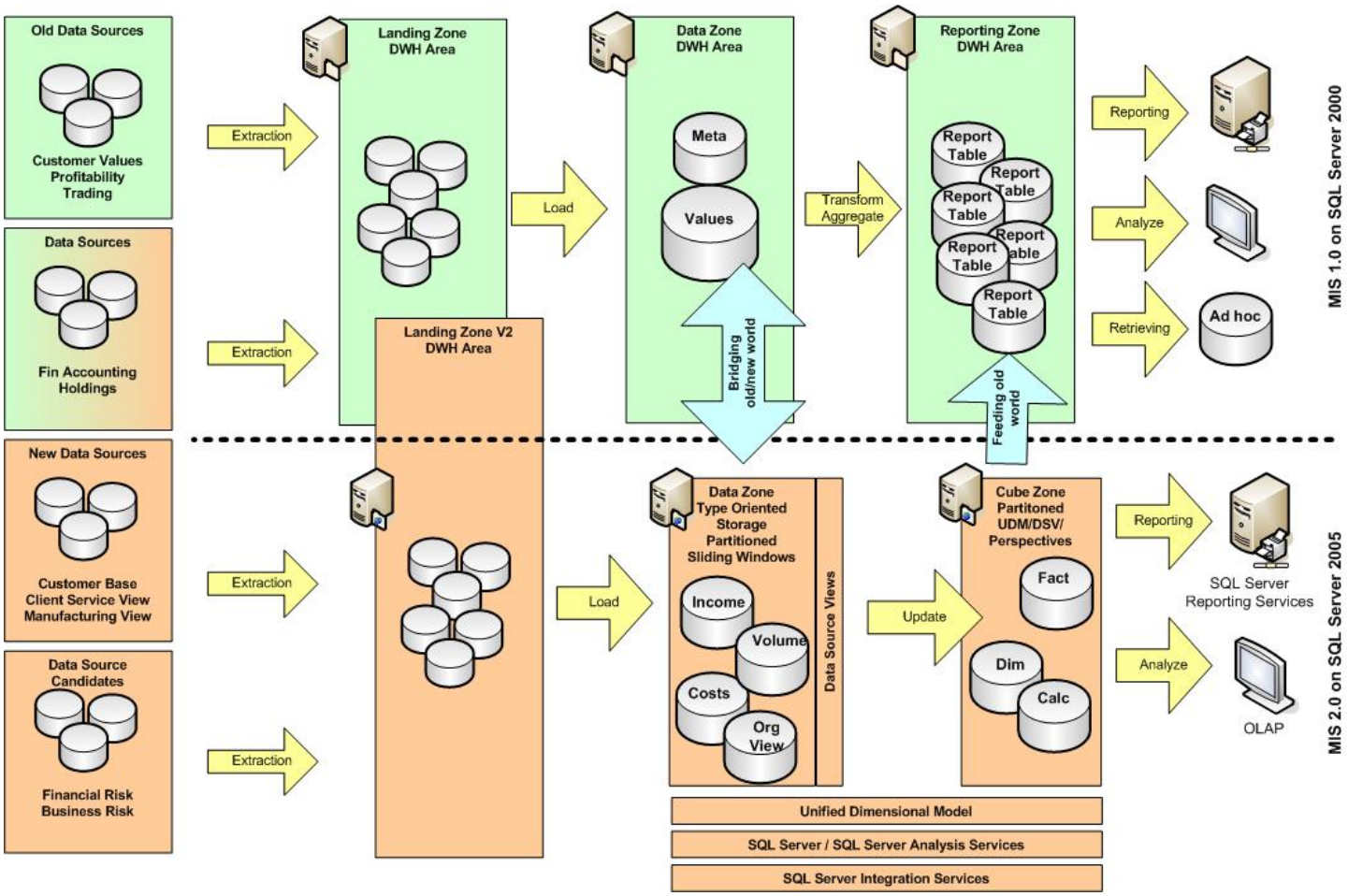
Figure 1: SQL Server 2005 Analysis Services replaces 40 reporting tables, which slowed processing and created data inconsistencies in the former solution, with OLAP cubes in a unified data model

efficiently, using MDX code (see Technical Appendix). The solution also uses the Microsoft Visual Studio® 2005 development system to take advantage of the 64-bit computing capabilities of SQL Server 2005 and the underlying Microsoft Windows Server™ 2003 Enterprise x64 Edition operating system, also part of Microsoft Windows Server System.

The solution runs on a Hewlett-Packard Proliant DL585, four-processor, dual-core computer with storage on an EMC 3.7 terabyte storage-area network. With 64-bit computing and addressing power, the solution can keep most of the data in memory. This capability, along with double-page size, speeds the load and query processes.

Given the highly business-critical nature of the solution to the bank, Lusti and his colleagues devised a careful step-by-step plan to migrate to the new environment.

Solution development began in August 2005, after the Trivadis training. The first data cube in the solution went into production three months later, in November 2005. The first reports are scheduled to be available by January 2006.



"We wrote interface elements in Visual C# and data warehouse code in SQL, MDX, and C#, but we have one environment, Visual Studio, to support the entire software lifecycle."

Hansjürg Lusti, Business Project Leader, Management Accounting, Bank Leu

The two environments will run in tandem for a few months until the bank switches over completely to the new solution early in 2006. Figure 1 shows the integration of the old and new environments during the period in which they run concurrently.

The new solution replaces consolidated inputs on customer volume figures, profitability, and trading activity, with a more detailed information flow on the customer's base data, the services a bank client uses, and the "manufacturing" view, which presents the cost basis for provided services. New data sources on financial and business risks are also being included. The bank will continue to use SQL Server Data Transformation Services for some of its extraction needs, moving to SQL Server 2005 Integration Services for new data sources and for the crucial movement of data from the data loading zone to the data and cube zones.

The single, large table of the original solution's data warehouse, one of that solution's bottlenecks, is being replaced by a series of type-oriented tables for income, volume, and costs. With the ability of SQL Server 2005 to partition relational tables and OLAP cubes, the load process is faster and small pieces of data can be reloaded very quickly. The new architecture also enables parallel processing of the data so that tables can be filled simultaneously, speeding the process even more. SQL Server 2005 Analysis Services is used to create three OLAP data cubes: a cube containing all daily trade information for a given week, a monthly profit center reporting cube, and, temporarily, a cube feeding data to the old reporting system until the complete cutover to the new solution.

The solution takes advantage of the new unified dimensional model of SQL Server 2005 Analysis Services, which combines the flexibility of relational data with the speed of OLAP cubes. Each dimension attribute can be used as an attribute hierarchy to separate and pivot the data. The attribute hierarchies can be used to build a user hierarchy that supports the user with data research capabilities. Because the size of the cubes is mainly based on the number of dimensions, rather than on the number of hierarchies within them, the solution accommodates a large number of hierarchies.

The cubes contain approximately 500 gigabytes (GB) of data. The cubes were created with 110 million records—the aggregation of year-to-date information—and now are growing at the rate of 5 GB and 22 million records per month.

"We create all the perspectives that Bank Leu needs out of these three cubes," says Weiss. "If management accountants want to see cost data, they don't need to select the cube containing cost information. Instead, they go to the monthly cube and filter the relevant information. The big advantage of SQL Server 2005 comes when additional volume data is needed, since the volume perspectives can be built from the same source just by using another filter. The management accountant may be looking at different information, but in fact the accountant is using the same cube and the same underlying data. The filters are also built using MDX code."

Bank Leu plans to provide its managers with three performance management reports created using SQL Server 2005 Reporting Services. Managers can ask the management accountants for drill-down data, which they will generate through direct queries of the SQL Server 2005 Analysis Services cubes.

## Benefits

Bank Leu expects to boost the productivity of its management accountants by up to 40 percent, to enable them to be more service-

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oriented, and to save half of the implementation costs of alternative solutions. Already, development time and costs are small fractions of what the bank would have experienced without the broad functionality in SQL Server 2005 and the Microsoft Visual Studio 2005 development system.

## Productivity Increase by 20 to 40 Percent

As a result of the move to SQL Server 2005 Analysis Services, SQL Server 2005 Reporting Services, and a third-party OLAP client, Bank Leu expects the productivity of its management accountants to climb by 20 to 40 percent, freeing nearly two days of time each week for each accountant. Management accountants who prepare the weekly and monthly reports will save time because the SQL Server Analysis Services cubes will eliminate the need to conduct maintenance and consistency checks among 40 tables, as was required previously.

Management accountants who respond to user questions for more information will save a similar amount of time because they can now conduct ad hoc, what-if scenario analyses on-the-fly, instead of having to process laborious queries. And 64-bit computing provides larger memory addressing that speeds the entire solution, Weiss says.

"With the old system, it took hours, to get answers back to our users, because data selection was very time consuming and required special runs," says Lusti. "With SQL Server 2005, our management accountants will be able to respond to users in the same phone calls in which the requests are made."

Faster responses are the least of the benefit that Lusti expects. "We'll reduce the complexity of our reports while making more data and analysis available to our users more quickly. We expect to enhance the quality of what we do. Our department will become more visible to our internal customers, more service-oriented. Because our management accountants won't spend as much time preparing data, they can spend more time producing useful, in-depth analysis and relying on one single source of truth, the data cube."

## Costs Cut 50 Percent

Bank Leu needed to support its rapidly growing business—but it wanted to do so without rapidly increasing costs. The new solution meets that need, as well. Lusti estimates that software licensing would have been 200 to 250 percent as much as the SQL Server 2005-based solution had the bank chosen a combination of OLAP processing and separate tools software. That puts the cost of the SQL Server 2005-based solution at no more than 50 percent of the cost of the alternative.

"Where else can you find a solution having as much functionality as SQL Server 2005 with this price tag?" asks Lusti. "You get it all in one with SQL Server 2005. It's much more than just a database. It's astonishing to me what the new edition contains. And beyond the immediate cost savings of not having to purchase separate tools for ETL, analysis, and reporting, there's an additional benefit: We only have to train our people on one solution, and then we only have to maintain one solution."

## Speeds Development

The use of SQL Server 2005 Analysis Services, SQL Server 2005 Reporting Services, and Visual Studio 2005 also speed development compared to the development of the previous solution. The earlier solution took two years to build from ground up, compared to three months for the new solution. Approximately two developers worked on each solution.

“Thanks to excellent development support of SQL Server Developer Center, we built the cubes using clicks, drags, drops, and a few lines of MDX.”

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The use of SQL Server 2005 Analysis Services enabled Bank Leu and Trivadis to develop the solution with 80 percent less code than they would have needed otherwise, according to Lusti and Weiss.

“The MDX code in SQL Server Analysis Services automates what would have otherwise been a highly manual and time-consuming coding process,” says Weiss. “Thanks to the excellent development support in SQL Server Developer Center, we built the cubes using clicks, drags, drops, and a few lines of MDX. If it weren’t for this technology, we would have had to reduce functionality or see the development time and budget increase tremendously. Instead, we have both the flexibility of the relational world and the flexibility and speed of the cube world.”

In addition, Lusti credits Visual Studio 2005 for providing a single development environment in which developers writing in different languages—including SQL, MDX, and Microsoft Visual C#®—can collaborate, further speeding development.

“This fact is extremely helpful when you want to move as quickly as possible” says Lusti. “We wrote interface elements with Visual C# and data warehouse code in SQL, MDX, and C#, but we have one environment—Visual Studio—to support the entire software life cycle."

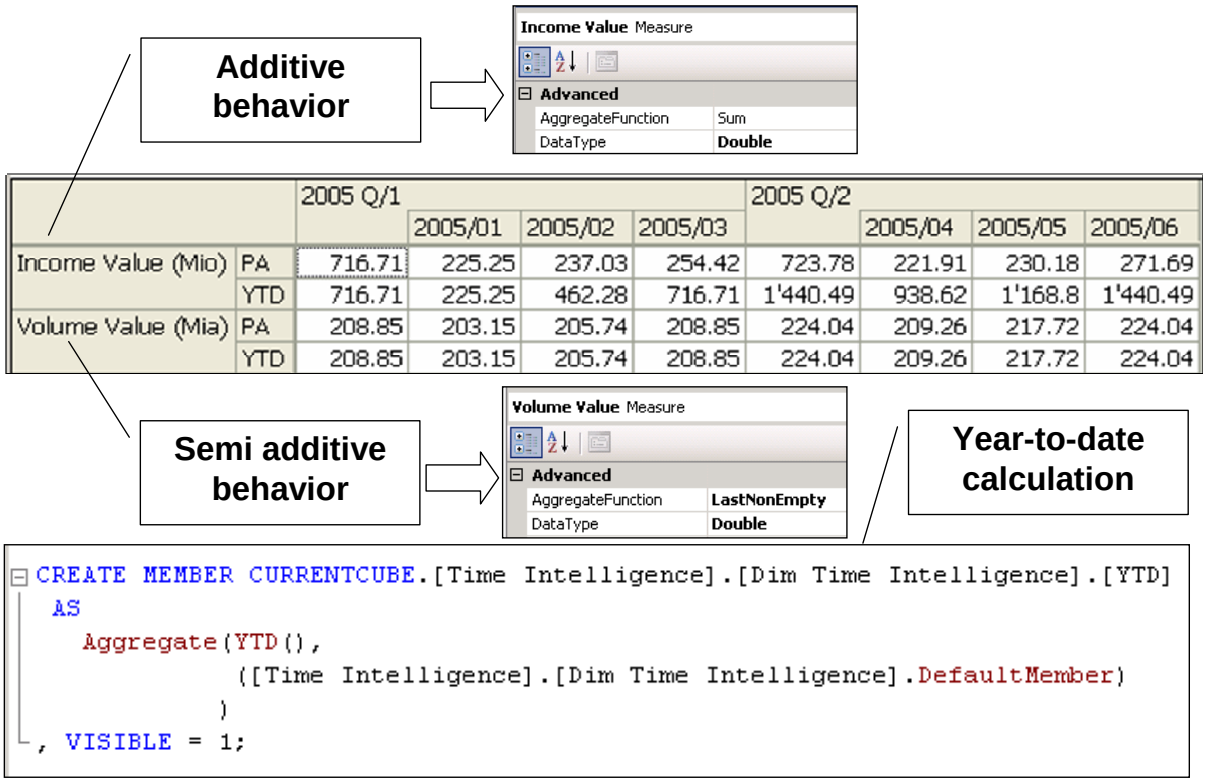
## Technical Appendix: A Closer Look at MDX

MDX code in SQL Server 2005 Analysis Services enables the relatively fast creation of additional calculated members in Analysis Services cubes. The MDX language is time-aware and includes a huge amount of common analytical functions, making it possible to solve a business question with a few lines of code.

As an example of how the Bank Leu solution exploits MDX code, not all measures can be aggregated using the SUM function. For example, volume figures such as account balances cannot be summed up over the time dimension. SQL Server 2005 provides the aggregation function "LastNonEmpty" to handle such semi-additive measures. See Figure 2. Analysis Services enables users to build time dimensions and immediately apply a single MDX statement that calculates the year-to-date values regardless of the selected time level (quarterly or monthly view).

To solve the same problem with a third-generation language (such as Visual C# or Microsoft Visual Basic®) or with SQL would require additional code. This helps to enable the lean implementation of the new solution. Pre-calculated performance indicators, such as Return on Assets or Cost Income Ratios, are available for each data slice, regardless of the time period selected. So, Bank Leu management accountants can answer ad-hoc questions more quickly and with less maintenance effort.

Figure 2: Calculated members in the solution benefit from the simplicity of MDX code in SQL Server 2005 Analysis Services



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