



ACTIVEVIAM

Analyzing data. Empowering the future.

Traders gain intraday VaR insight

CASE STUDY

Our client needs regarding VaR

Our client is a major regional bank active in capital markets, asset management, retail banking and insurance. In line with the Basel II requirements, the bank has to comply with the Value at Risk (VaR) framework. Its vision for VaR however goes beyond the calculation of a single number or a tick-box exercise to comply with regulatory requirements. Instead, the bank has developed several functional enhancements, working alongside ActiveViam, to bring VaR into the front office and facilitate true collaboration between traders and risk managers. This unique approach to VaR has helped to transform the business and its management of risk.

About Our Client

Our client is a leading European bank which has grown beyond its domestic market and built an established presence in both neighbouring countries as well as within the major trading hubs of New York and London. The bank is widely recognised for its ability to manage risk while building an impressive growth story. Both the bank's financial results and staff have been praised through award accolades such as 'most secure bank in its region'. It is also one of the very few banks to achieve a positive total shareholder return since the beginning of the crisis.

Problems Faced

Helping our client required overcoming extremely challenging technical aspects. Very large amounts of information had to be stored while maintaining sub-second query response times. Indeed the non-linearity of VaR calculations imposes to store all the P&L simulations for VaR, and not only VaR as measured for each trade.

Our client had already implemented a custom-made system based upon a market leading OLAP analysis server solution. The classic cube was built during night batches with end of day risk data. However, our client found that it wasn't practical due to the very nature of VaR calculations which require non-linear aggregation of vectors. Indeed, unlike for P&L positions which simply add up, the VaR of a trade does not add up to that of another trade or portfolio of trades. Classic OLAP used for VaR involves developing highly complex queries that are extremely hard to maintain. In addition, execution of the queries can be very slow which is frustrating for users.

With such slow response times, it was impossible to envisage a cube that could be updated with real-time trades since the system would block all user interaction while changes were being applied. Such functionalities were required by the business, but could not be achieved with the bank's existing solution.

As we engaged in discussions with our client, we realised that the bank had an even more detailed and complex set of requirements; none of which seemed feasible with the incumbent solution.

These requirements included:

- ▶ The need for VaR data to be sourced from two or more separate trading systems
- ▶ The requirement to update the target systems intraday to reflect latest trades and provide risk exposures in real-time
- ▶ The ability for users to configure temporary portfolios for VaR analysis on a subset of trades
- ▶ Ensuring that simulations made by one user do not impact others
- ▶ The requirement for the system to compute VaR and marginal VaR at any percentile selected by the user; and additional specific measures such as Tail VaR
- ▶ Finally, the system had to be able to substitute a worst scenario of historic VaR into the scenario VaR and vice-versa to help users understand stress correlation

Strategy

We worked with our client to build a complete, high performance solution based on our cutting-edge solution, ActivePivot™, a real-time in-memory OLAP engine.

Building Complex VaR Analytics

ActivePivot delivers unmatched computation speed with the ability to work natively with complex mathematical objects such as very large vectors which are required for VaR. ActivePivot calculates statistical indicators in a split second making it a very convenient tool that can be used to slice and dice a result for in-depth analysis. Our analytics platform is the only solution able to manipulate vectors as single objects which dramatically reduces storage and access size, while other OLAP cubes assume the data resides in a relational database.

In our client's case, once the VaR calculation had been solved, we worked on building the customised analysis that the bank required: marginal VaR, tail analysis and market crash or discontinuity simulation. Furthermore users gain additional insights as they can change parameters of some metrics such as the number of days for a tail VaR analysis. The breadth of metrics provided and the interactive capabilities enable VaR to become actionable vs. simply an output measure for regulatory purposes.

Enabling Real-Time Data Federation

The ActivePivot Integration Services enable a truly real-time and flexible data federation and input to our system. Since values do not have to be predefined, any number of data sources can be incorporated as long as a relation map is defined between them. In order to further enrich the analysis for our client, we created additional dimensions for analysis by tagging data according to its source and type: intra-day or end of day.

ActivePivot can directly connect to calculation grids or any risk system to input their outputs directly. So the risk simulations for the trades do not have to pass through an intermediary database.

From Trade to VaR Transactional System

Our Data Integration Services fully integrate with the analytics platform to push new data during the day and instantly update analysis results shown. We can add new facts to the OLAP cube in real-time and because the calculations are made 'on-the-fly', per user request, the most up to date data set is taken for calculation and so real-time analysis is provided. As a result, whenever a new trade is made by one of the bank's desks, and its risk analysed, information is instantly added to the OLAP cube.

ActivePivot™ instantly updates all the computations that users are asking for and informs users if the new data has any impact upon the trade. In the specific case of our client, whenever a new trade is made, VaR calculations have to be dealt with by a risk engine before being fed in ActivePivot through our Integration Services.

Scenario Analysis

Our client was keen to run simulations without the process having an impact on other users' behaviour. Our technology has a unique security feature which enables this. Through ActivePivot, each user can only see those parts of the cube which he is authorised to view and when the user asks for a computation, it is made 'on-the-fly'. If a user inputs a (set of) new trade(s) without enabling them for others, it is only his views and calculations which will include these inputs.

We also built a specific user interface to make this much easier for our client and then took it a step further to enable users to not only add trades but also retrieve trades. In other words, customisable portfolios of trades are easily built by each user who can then lead analysis on and with this subset. When a hypothetical trade is added, the system automatically computes the VaR vector associated with it.

Benefits delivered

Our technical solution connects to the bank's trade systems and from the moment a new trade's risk data is available, we push the information instantly in ActivePivot and update the cube. The real-time impact of the bank's activity is then visible and can be acted upon. In addition to an efficient monitoring tool, ours enables business growth as traders can understand their own current risk levels and simulate the impact upon them of new trades. In terms of depth of analysis, our solution is unmatched as it delivers not only VaR calculations, but also marginal VaR, tail analysis and stress scenario simulation; all of which are feasible on the most customisable set of trades for each user. Finally, these business features come while maximising the value of your existing assets: no additional database is required; reuse of your existing valuation engines is possible; while requiring only commodity type hardware for our high performance in- memory vector aggregation engine.

Key Features

- ▶ Continuously up-to-date computation of VaR and related metrics with user chosen parameters
- ▶ Instant integration of new trades to provide actionable front office data
- ▶ Sub-second calculations providing ability to break down risk component and identify drivers
- ▶ Native ability to input and compute vectors
- ▶ What-if capability to simulate one or more trades

Key Benefits

- ▶ Make VaR an actionable measure
- ▶ Easily manage VaR limits
- ▶ Pre-deal check of VaR impact
- ▶ Provide a shared tool and single data source for both Risk Management and the Front Office
- ▶ Make the most of your existing VaR investments with no additional database costs



**Need more
details or want
to ask us a question?**

Contact us on activeviam.com

LONDON

6th floor Shaftesbury House
151 Shaftesbury Avenue
London WC2H 8AL
Tel: +44 20 7836 8820

NEW YORK

1412 Broadway Suite 2300
New York, NY 10018 USA
Tel: +1 646 688 4442

PARIS

46 rue de l'Arbre Sec
75001 Paris, France
Tel: +33 1 40 13 91 00

SINGAPORE

29 C Stanley Street, #03-01
068738 Singapore
Tel: +65 62 24 46 63

HONG KONG

21/F On Hing Building
1 On Hing Terrace
Central, Hong Kong
Tel: +852 3971 9154

About ActiveViam

ActiveViam provide precision data analytics tools to help organisations make better decisions faster.

ActiveViam started in 2005 with the vision of leveraging in-memory technology to create an analytics platform where businesses could leverage the largest data sets without restrictions, keep them up-to-date in real time and use them to empower their decision makers.

Our goal at ActiveViam, is to let organisations not only make decisions faster, but better; to not only reach their data, but their potential; to not only see their data, but find their way into the future.

ActiveViam is a privately owned company with offices in Paris, London, New York, Hong Kong and Singapore.

For more information please visit:
www.activeviam.com