

# Risk

TECHNOLOGY RANKINGS

# 2014

Risk.net December 2014



**Numerix voted #1  
for XVA Calculation**

Introduces innovative  
model validation  
technology

# Doing more, for less

Banks are trying to cut costs at a time when more is being asked of them – and this means software vendors face the same problem. The solution is to embrace cutting-edge tools and technology, as the winners of this year’s technology rankings testify.

By Clive Davidson

**W**hen bank regulation changes, so do banks; and when banks change, software and systems have to support them.

This is not a new story – the sector has been grappling with these challenges for much of the past five years – but the intensity has stepped up as implementation of the rules arrives, and has been complicated by the fact that banks are under huge pressure to cut costs. It means vendors are having to do more without charging more, which in turn means leaning heavily on advances in technology, primarily those driven by the internet, at every level of their systems’ functionality.

“Regulations such as the Dodd-Frank Act, the European Market Infrastructure Regulation and Basel III have transformed the way markets operate. A product such as a swap might still be defined as before, but the way a bank has to price it, execute it, calculate and manage the risks, and follow it through its lifecycle has completely changed,” says Maroun Edde, chief executive officer of Paris-based Murex, which topped this year’s rankings with 11.4% of the overall vote.

Part of the problem is an “explosion in the dimensions of valuation”, says Boris Lipiainen, head of product management at London-based Misys, which came second overall in the rankings with 11.1% of the vote.

“It is no longer satisfactory to just compute historical value-at-risk. Banks are increasingly applying more sophisticated measures such as Monte Carlo VAR, credit and all the various other valuation adjustments, potential future exposures and associated limits, and undertake stress tests – all in real time,” says Lipiainen.



Traditional derivatives trading systems, with the relatively discrete modules for front, middle and back office that mirrored previous market practice, are no longer fit for purpose – neither are specialist risk management systems, which often run on the basis of overnight batch processing. What is required instead is robust, high-performance calculation capabilities, matched by high-speed, high-capacity data management, in an open architecture that will integrate with banks’ infrastructure as they transform their operations for the new market conditions – and all at significantly reduced IT costs.

“Many banks are now asking how they can undertake this massive infrastructure change to rebuild their capital markets factories, industrialising most of it while maintaining an essential degree of flexibility, and do it in the context of

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**“Anything that can be done to facilitate faster model validation helps the front office take advantage of the opportunities”**

Jim Jockle, Chief Marketing Officer, Numerix

Put simply, risk, capital and funding considerations that might previously have existed in the somewhat-separate world of the middle office have come crashing into the world of the trader. In addition, many of them depend on questions about clearing and collateralisation that would previously have lived an entirely separate existence in the back office.

constrained budgets,” says Edde.

Inevitably, the answer has to come from the vendors. “An increasingly changing market landscape has made it essential to reduce total cost of operation by a quantum leap and not just a marginal improvement. The pressure on profitability and return on capital is so great that incremental improvements in costs won’t cut it,”

says Charles Marston, chairman and chief executive officer at California-based Calypso Technologies, which came fourth overall in the rankings with 8.3% of the vote.

In response, the vendors are overhauling their systems' architectures and drafting in the most advanced technologies from the internet world and other industries – complex event processing (CEP), in-memory databases, parallel processing, super-fast chips, cloud computing and more. Vendors claim these tools can handle more calculations, more quickly, flexibly and at lower cost. Or, at least, not a vastly inflated cost.

Take Toronto-based IBM Risk Analytics and its counterparty credit risk system as an example: "Our traditional solution was middle-office, batch-orientated, and provided end-of-day counterparty exposure measures as a baseline against which clients could put their limits structures," says Andrew Aziz, the company's director for financial engineering, research and on-cloud solutions. "Increasingly, we've seen a move away from that to an architecture that is heavily event-driven, with real-time capabilities and high availability, and plugged into the trading systems to provide incremental risk measures that are consistent across the enterprise."

Aziz admits his company backed into the use of CEP technology – which monitors streams of data in real time to identify relevant events – first using it to manage risk for electronic trading. "Once the technology was out there, clients wanted to apply it to multiple asset classes, to credit valuation adjustment (CVA) and other needs, so it has evolved into our major platform, linking in with our other engines. It plays into the theme of making risk analytics more relevant to the front office," he says.

Parallel-processing approaches – from programme design to the use of networks of processors or specialist hardware such as graphic processing units – are now essential to cope with the scale of the calculations for pricing and risk, which might involve hundreds of billions of calculations just for CVA, for example.

"These technologies that were once experimental are going mainstream, and the issues now are how to make sure they can handle all asset classes and market data, and how to hide the technical complexity from quants so they can write their pricing models in a high-level language while the platform takes care of the parallelisation, data-marshalling and clustering, and distributed processing," says Lipiainen at Misys.

<b>Enterprise-wide risk management</b>			
<b>Credit value adjustment/debit value adjustment/ funding value adjustment calculation</b>			
<b>2014</b>	<b>2013</b>	<b>Vendor</b>	<b>%</b>
<b>1</b>	<b>1</b>	<b>Numerix</b>	<b>15.1</b>
2	2	Murex	14.6
3	4	IBM Risk Analytics	13.8
4	3	Misys	10.4
5	5	Calypso	9.6

**"Everyone is protective of their intellectual property, so not accessing the code was a critical requirement and the biggest challenge we had to solve"**

Jim Jockle, Chief Marketing Officer, Numerix

With sub-second response as the target, there is no time to move data to and from storage devices, so it must be held in memory – another technology that vendors are having to adopt to meet their clients' requirements. In fact, vendors are having to upgrade at every level of what is known as the technology stack – the hierarchy of components that comprise a system, from the hardware, through communications, software and data, to the final output and its manipulation. In addition to in-memory databases, parallel processing and CEP, the advanced technologies include high-bandwidth networking, parallel-storage mechanisms and advanced data-visualisation techniques.

**Remodelling for new markets**

The way vendors are packaging these capabilities is changing too. Although they still offer dedicated applications, such as equity derivatives pricing or historical VAR calculators, the vendors are developing more high-level, generic components and capabilities aimed at helping banks remodel their operations for the new market regime. Misys, for example, is creating a set of facilities, such as parallel pricing, limits management and collateral management, that sit on top of a bank's existing applications and interact with them, whether they be in-house or vendor systems.

"We realised these sort of capabilities could no longer be buried in the guts of our particular systems, but must be deployable across a bank's systems and across asset classes," says Lipiainen.

He gives the example of an emerging market institution wanting to build a risk management system for its corporate and investment bank. "The chief risk officer and chief financial officer want to look at the whole balance sheet of the bank, including the various Basel III funding ratios and internal management perspectives on the liability side, and express their risk appetite in terms of how much exposure they want to take by factors such as asset class, counterparty, market and industry segment, then deploy it as a real-time solution that works across the entire bank, including trading and the lending portfolio. And they want tools to build this out," he says.

Murex's Edde describes his company as a "transformation enabler" – summing up the role into which vendors are increasingly being thrust. Murex already has a "surprising number" of such transformation-type clients, where the initial engagement is with C-level executives and not just trading desk or IT managers, he says: "It's a massive change from five years ago."

One technology evolution that banks remain unable to fully exploit is cloud computing. With its vast, on-demand resources, outsourced

maintenance and upgrades, and relatively low cost, cloud is theoretically an ideal solution to the industry's current IT problems. Lingering security concerns are one reason banks are holding back.

"Cloud adoption in capital markets is still modest, as participants are just starting to get comfortable with security concerns," says Marston of Calypso. But it is the computing-without-frontiers model of cloud that is the real stumbling block – many regulators will not allow client data to leave a bank's jurisdiction. Temporary solutions include the use of private clouds – mini-clouds operated by the bank itself or a third-party and located within the relevant jurisdiction – or hybrids. For example, IBM Risk Analytics recently created a hybrid cloud infrastructure for Chinese financial terminal provider Shanghai Wind Information whereby IBM makes its software available via its global IBM Algo Risk Service on Cloud, while client data is held in a locally installed implementation of IBM Algo One Risk Aggregator.

Where client data is not an issue, such as in testing new software or models, many banks are already making use of public clouds, such as those provided by Amazon, Microsoft or Google. So are vendors – Misys runs nightly tests of its valuation software development on Amazon's cloud for example.

Many in the industry believe the advantages of public clouds and their ubiquity in other industries will lead to a relaxation of data regulations. "We view private cloud as essential today, and public cloud as essential in the long term. We are confident that at some point in the future there will be the regulations that allow confidential data on public clouds, so we are working in the background to support that," says Murex's Edde.

### Practical problems

At the same time banks are going through strategic upheaval, they also have to address a number of pressing practical issues, such as the central clearing of OTC derivatives trades. "The immediate challenge of central clearing is operational – the legal set up, getting back-office aspects in place and focusing on simple things such as making sure the right exposures are aggregated to get to the right amount of risk, especially for client clearing," says Dan Travers, vice-president of product management for the capital markets business at SunGard, which came fifth overall in the rankings with an 8.1% share of the vote.

Clearing needs enhanced data management and workflow capabilities, says Travers, but he adds that – so far – the talk is outpacing the reality. Only the biggest banks are able to forecast margin requirements pre-trade, for example.

Another issue regulators want to see addressed is model risk and model validation. The problem is that while banks introduce new models nimbly – to support new instruments or strategies – validation can take 12 to 18 months to complete, says Jim Jockle, chief marketing officer and senior vice-president at New York-based Numerix, which took eighth place in the rankings overall with 4.8% of the vote. To take advantage of these opportunities, banks can deploy the new models, but must put exposure limits against them as well as capital reserves. "Anything that can be done to facilitate faster model validation helps the front office take advantage of the opportunities," says Jockle.

Until now, validation has been a largely manual process, often outsourced to consultants and undertaken in spreadsheets using a sampling approach and expert judgement. However, a number of banks noted Numerix had auto-

mated the validation process of its own models and asked whether the company could extend that capability to clients, Jockle says.

The company has done this by adding a module to its CrossAsset analytics framework that interfaces with in-house or third-party models and will automate a quantitative validation using a scenario approach and current market data – in a grid- or cloud-computing environment if required. Crucially, validation takes place without accessing the model's underlying code.

"Everyone is protective of their intellectual property, so not accessing the code was a critical requirement and the biggest challenge we had to solve," says Jockle.

Another immediate challenge facing banks is the requirements of the US Commodity Futures Trading Commission that swap dealers and major swap participants preserve all information necessary to comprehensively and accurately reconstruct swap trades within three days of a request, including all forms of communication and documentation, and maintain trade records that are identifiable and searchable by transaction and counterparty.

Recreating the entire life-cycle of a swap is a daunting proposition for most firms, says Ben Macdonald, Bloomberg's global head of product and president of the company's swap execution facility. Bloomberg took third place overall in the rankings with 8.6% of the vote. Although the requirements have not yet been tested to reveal how they might be enforced, Bloomberg has, in preparation, enhanced the surveillance and compliance functionality in its Bloomberg Vault managed data service to encompass all communications, including online messages and chats on its own terminal and other services, as well as instant messages, voice, mobile and social media, says Macdonald. **R**

### HOW THE POLL WAS CONDUCTED

*Risk* polled thousands of banks, hedge funds, pension funds, insurance companies and corporate treasurers for this year's technology rankings, and received 786 valid responses.

Respondents were asked to vote for the technology vendors that provide the best product offering across a number of categories, including enterprise risk management, risk capital calculation, trading systems, and pricing and analytics.

Participants were asked to base their votes on

functionality, usability, performance, return on investment and reliability. Nominated technology companies were awarded three points for a first-choice vote, two for a second-choice vote and one point for a third-choice vote.

Only technology end-users were allowed to vote. *Risk* conducted a comprehensive due diligence process and disqualified any votes that were felt to be unfair. These include people voting for their own firm, or relatives of someone who works in that company voting

for the firm, multiple votes from the same person, multiple votes from the same IP address, proxy votes on behalf of customers, votes by people who choose the same firm indiscriminately throughout the poll, votes by people clearly not involved in the business areas covered by the poll, and block votes from groups of people on the same desk at the same institution voting for the same firm.

The editor's decision is final in determining the validity of votes.

## Overall

### Overall

2014	2013	Vendor	%
1	1	Murex	11.4
2	2	Misys	11.1
3	5	Bloomberg	8.6
4	4	Calypso	8.3
5	3	SunGard	8.1
6	6	IBM Risk Analytics	6.3
7		Thomson Reuters	5.2
<b>8</b>	<b>7</b>	<b>Numerix</b>	<b>4.8</b>
9	8	Moody's Analytics	4.7
10	9	SAS	4.0

### Pricing and analytics

2014	2013	Vendor	%
1	1	Murex	13.1
2	3	Savvysoft	11.9
3	4	Bloomberg	11.5
4	2	Misys	10.9
<b>5</b>	<b>5</b>	<b>Numerix</b>	<b>9.6</b>
6	6	Calypso	7.5
7	7	SunGard	6.4
8		Thomson Reuters	5.2
9	9	Pricing Partners	4.6
10	8	Fincad	4.5

### Enterprise-wide risk management – market, credit, counterparty, liquidity, aggregation, Basel III

2014	2013	Vendor	%
1	1	Misys	13.4
2	2	Murex	13.2
3	3	IBM Risk Analytics	11.3
4	4	SunGard	11.1
6	5	Calypso	9.5
7	7	Bloomberg	8.8
7	6	Moody's Analytics	8.4
<b>8</b>	<b>8</b>	<b>Numerix</b>	<b>6.0</b>
9=		MSCI	4.7
9=	10	SAS	4.7

## Pricing and analytics

### Equities

2014	2013	Vendor	%
1	3	Bloomberg	15.1
2	2	Murex	14.7
3	1	Misys	10.5
4	4	Savvysoft	9.7
<b>5</b>	<b>5</b>	<b>Numerix</b>	<b>8.5</b>

### Structured products

2014	2013	Vendor	%
<b>1</b>	<b>1</b>	<b>Numerix</b>	<b>16.2</b>
2	2	Savvysoft	15.7
3	5	Murex	14.8
4		Bloomberg	9.9
5	3	Misys	9.4

### Inflation

2014	2013	Vendor	%
1	1	Murex	16.5
2	3=	Bloomberg	14.7
3	3=	Savvysoft	14.5
4	2	Misys	10.0
<b>5</b>	<b>5</b>	<b>Numerix</b>	<b>8.8</b>

### Cross-asset

2014	2013	Vendor	%
1	1	Savvysoft	15.5
2	2	Murex	15.2
<b>3</b>	<b>3</b>	<b>Numerix</b>	<b>12.2</b>
4	4	Misys	10.6
5		Bloomberg	9.1

### Rates

2014	2013	Vendor	%
1	2	Savvysoft	14.9
2	3	Murex	14.4
3	1	Bloomberg	13.7
4	4	Misys	10.4
<b>5</b>	<b>5</b>	<b>Numerix</b>	<b>8.9</b>