Building success in risk technology

The results of *Risk*'s first-ever technology rankings – voted for by over 350 users of risk-based software products – show a highly competitive industry where firms must strive to stay abreast of financial innovation. Clive Davidson reports

Risk's inaugural technology company rankings reveal a highly competitive industry, where derivatives trading and risk system suppliers must constantly strive to meet the demands of customers who themselves are engaged in dynamic and highly competitive businesses.

Apart from enterprise risk management, where Toronto-based Algorithmics dominated, all other categories – trading systems, trading analytics and front- to back-office systems – were closely fought.

And as a sign of the maturity of the trading and risk technology sector, most companies cited in the rankings now offer applications that cover multiple assets and scored in more than one category, although a few, such as Financial Engineering Associates (FEA) in commodities analytics and Sophis in equity derivatives front- to back-office, have cornered the market in one particular area.

The exception in this picture is operational risk management, where it is clear that the technology is still in its early days and effective products are only beginning to gain credibility and market share.

Algorithmics ranked number one in market and credit risk, and credit limit checking, second in credit risk capital calculation, and first in operational risk capital calculation. As one of the organisations that helped define enterprise risk management, and one of the few technology suppliers to focus solely on this area, with more than 150 clients now across the globe, its commanding position comes as little surprise.

What is perhaps surprising is that some of the front- to back-office systems suppliers, such as Stockholm-based Front Capital Systems and Paris-based Murex, which have risk as a component rather than a focus of their systems, should be ranked above other enterprise risk specialists, such as North Carolina-based SAS and Germany's SAP.

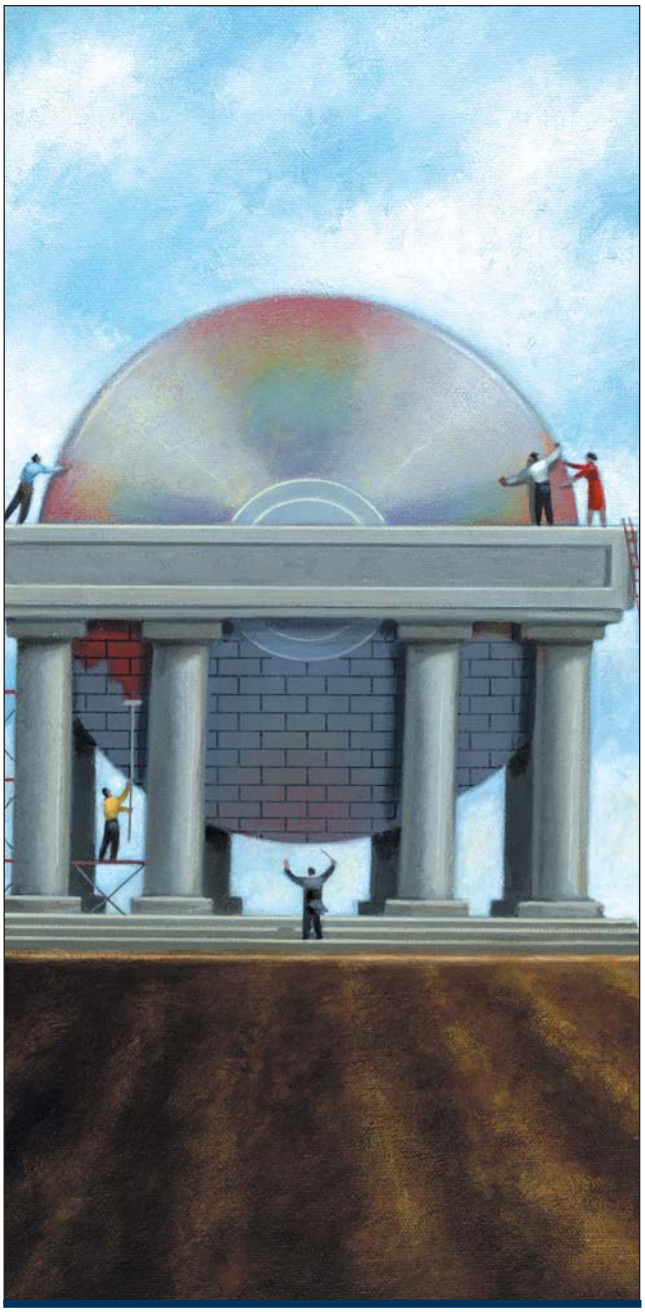

Image: Corbis

Algorithmics believes it has succeeded because it has built its system on the premise that there is no short cut to good risk management. It requires clean comprehensive data on all sources of risk; it requires that all instruments are properly valued; and it requires that the valuations are projected forward in time to the risk horizon, with stress testing. It took the industry a little while for it to reach a consensus on the need for full forward valuation and stress testing, but now it is standard.

"Early on, we had a vision that full forward valuation is necessary – you have to value securities properly, and compute their value forward in time properly, taking into account all aspects of the instruments, such as settlement etc," says Ron Dembo, founding chairman of Algorithmics. This is an enormous challenge when dealing with global portfolios of multiple assets, especially for intra-day analysis. Approximations only work in a limited number of situations, says Dembo, and nowadays there is increasing demand for near real-time analysis. Part of Algorithmics' solution is its Mark-to-Future methodology, which decomposes portfolios into instruments whose value can be efficiently computed using distributed processing. Michael Zerbs, chief executive at Algorithmics, says: "Mark-to-Future is established as the central enterprise risk engine at leading financial institutions, enabling proactive risk-based responses to business opportunities. It is at the core of our clients' strategy for comprehensive capital management solutions that integrate risk, regulations and finance."

Algorithmics also features in the top five rankings in all but the self-assessment category of operational risk, while ranking first in capital calculation. This is still clearly an emerging market, and Algorithmics' product, like those of most of its competitors, is still in an early stage of evolution.

One of the most mature products available, Sword from Switzerland-based Comit Group, which ranked first for key risk indicators and internal loss data gathering, was only launched in 2000, whereas most of the risk and trading systems in the rankings are more than a decade old. And unlike risk and trading systems that now tend to have comprehensive functionality, the operational risk systems generally do not yet have a full suite of components, most often lacking a capital calculation module. But this does not appear to stop organisations from using the available components

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to assist in their operational risk management endeavours across the board.

Comit, for example, is placed fourth in the operational risk capital calculation rankings despite not yet offering a dedicated capital calculation module. Steve Scott, head of sales and consultancy for Sword, suggests that organisations may be using Sword's data management and reporting functions to access and prepare data for their own capital calculations. In fact, operational risk is one area where organisations often still believe they can create an effective solution in-house.

Another indication of the immaturity of the operational risk management systems market is the fact that a number of respondents cited their front- to back-office systems in the operational risk management categories. While the straight-through processing, audit trails, processing statistics, etc, that such systems offer clearly help to minimise and manage the operational risk of transaction processing, op risk management as a separate enterprise-wide endeavour, with its use of risk self-assessment, key risk indicators and internal and external loss data analysis, appears to be not yet universally understood nor practised. Scott confirms this, saying that a fair amount of sales time for op risk software has to be spent educat-

ing customers about modern practice and regulatory requirements.

In the trading systems and front- to back-office systems arena, three companies dominate the rankings – Front, Murex and New York-based Summit Systems. Each ranked number one in several categories – Front in credit and equity trading systems and credit and cross-asset analytics; Murex in commodities trading systems and commodities and rates front- to back-office systems; and Summit in rates, structured products and cross-asset trading systems and structured products and cross-asset front- to back-office systems.

These companies were also in the top five of most other categories. Their systems have been around since the early 1990s, and each has been steadily expanded across asset classes and enhanced in functionality until they support the trading and risk management of most standardised instruments. This has benefited many organisations that have wanted to reduce the number of separate systems they have for different instruments, usually with the aim of reducing system licensing and support costs. However, other benefits have emerged from having different assets in the same system.

"Although credit derivatives are generally derivatives on fixed income, you also have a credit risk with an equity, and having the functionality to cover both products in the same system allows you to take advantage of trends in the market-place," says Stephen Butcher, chief operating officer of Front. "While traditionally an organisation might have hedged a fixed-income instrument with a credit derivative, now it can do it with an equity default swap because we have the consolidated cross-asset system that allows you to create those kinds of models."

But it is not the case that a supplier can simply add token coverage of other instruments on to its system primarily designed for one asset class, says Hervé Baulme, chief executive officer of Summit. "It may not be possible [for a technology company] to be number one in all types of instruments, but the challenge is to be considered very good in all asset classes – you need to offer a high-performance module for each market," he says.

Maroun Edde, managing partner at Murex, agrees. "If you are looking to build a true cross-asset platform it is not enough to be just average in any asset class," he says. The consistent appearance of companies such as Summit, Front and Murex in the top five of most asset classes appears to bear this out.

But as well as offering top-flight analytics themselves, the technology companies must also make their systems open to the integration of in-house analytics. "There are parts of any system that you should buy, and there are parts that you should do yourself," says Ron Netzel, managing director at Bank of America, who was a respondent to the survey. "The infrastructure by which we process trades and house trades, I don't look on as proprietary, but the analytics by which we look at how much a trade is worth, or how we represent a trade to help us understand our positions or risk better, those are things I look on as proprietary." So a key consideration in selecting a system is how easy it is to integrate the bank's analytics into the broader system, he says.

> "Mark-to-Future is at the core of our clients' strategy for comprehensive capital management solutions that integrate risk, regulations and finance" **Michael Zerbs, Algorithmics**

Another issue is how easy it is to integrate the system with the organisation's overall technology infrastructure. Few systems can operate in isolation these days, says Netzel. Hoan LeHuy, quantitative researcher at London-based New Finance Capital Partners, which also took part in the survey, agrees. "One of the most important factors in assessing a system for us is its flexibility in terms of interfacing with our existing systems," he says.

Although well-established systems from companies such as Front, Murex and Summit have the advantage of mature functionality, there is always the danger that they are leapfrogged by new systems built with more recent technology and which consequently offer higher performance, greater flexibility or other benefits. Therefore, while constantly extending and consolidating their functionality, the suppliers also have to periodically renew their underlying infrastructure to stay in the race. This can require substantial redevelopment, as new generations of technology are often incompatible with preceding ones. Companies such as Front, Murex and Summit, and the other contenders in the rankings, would not be around any more if they didn't keep up with the underlying technology evolution.

"We have to be in touch with the financial markets to respond to developments of complex new products, then we also have to be aware of what is going on in technology in terms of grid computing, parallel processing and so on," says Summit's Baulme.

Summit is adapting its software to run with Microsoft's .Net web services technology. Front is also currently upgrading its technology, and is replacing its proprietary messaging layer, which moves information around inside its system and communicates with the outside world (also know as middleware), of its Arena system with Tibco Enterprise Message Service, an industry de facto standard. "The advantage of this is that it forms the backbone of our service-orientated architecture, which enables customers to add their own services on to the Front application," says Butcher.

While support for multiple assets is clearly the direction in which systems suppliers are moving, some companies have maintained a stronghold in the particular asset class that they set out from. Sophis, for example, has a commanding position in the rankings in equity front- to back-office systems in which the firm originated, with the highest share of the vote for any company in any category. New York-based Imagine Software also set out from the same point, and is ranked number one in the equity trading analytics category. Both companies have since broadened the asset classes they support, particularly in fixed income, and more re-

cently have moved to exploit this in the growing structured products market.

In some cases, a technology company's particular customer base has influenced its position in the rankings. New York-based Wall Street Systems, for example, is ranked number one in foreign exchange in analytics, trading systems and front- to back-office systems, revealing its leading role in treasuries, within both financial institutions, particularly foreign exchange specialist banks, and corporates. Wall Street numbers BP, Ford and Hewlett-Packard among its customers, as well as ABN Amro, Deutsche Bank and JP Morgan Chase. The size of these organisations, and the core role Wall Street plays in their treasury activities, indicates the scale of some of the systems now in place and their industrial strength in terms of handling real-time global business.

In the realm of trading analytics, the full trading and front- to back-office system suppliers, including Front, Murex, Summit and Imagine, did surprisingly well compared with the analytics specialists. Although New York-based Bloomberg, NumeriX and RiskMetrics, and Fenics (part of GFI Group) and Monis (part of SunGard Trading and Risk Systems), both based in London, all featured in the rankings, it was Savvysoft (rates and structured products) and FEA (commodities) that stole the honours for analytics specialists. Savvysoft was ranked number one in interest rates and structured products analytics, and was in the top five in credit, foreign exchange and cross-asset. (The company also ranked number three in market risk.)

One of the challenges for an analytics specialist is keeping up with the innovation in the market. In the past 15 months, Savvysoft has added to its power-reverse dual-currency note a floor, a cap, odd exercise dates, final redemption in a different currency, final redemption according to formula, barrier early termination trigger in a different currency, barrier early termination according to a formula, coupon triggers based on a formula, optional early termination in a different currency, and optional early termination according to a formula. And that is just for one instrument.

But it is not just existing products that analytics providers must cater for – because of the continuous invention in the markets, organisations are looking to them to provide technology that will enable them to price any instrument they dream up, and with as little programming effort as possible. To meet this challenge, Savvysoft has developed an application called TreeTops that lets users write a simple function in the C programming language to describe the payout of a derivative – which can have unlimited factors – and then pass that function name to TreeTops to price the instrument.

"This way they don't need to rely on us to create the pricing model," says Rich Tanenbaum, president of Savvysoft. And for its users that do not know how to program in C, Savvysoft has created another application called TurboExcel whereby the user can describe their payout function in the Excel spreadsheet, and TurboExcel will turn it into C code, which can then be passed to TreeTops for pricing.

Supporting highly complex heterogeneous structures, and the constant innovation within structured products, is stretching software suppliers and the technologies they have at their disposal. But the other major challenge cited by many of the rankings winners is the volumes organisations are now expecting their systems to cope with.

Volumes are growing not only in traditional products such as equities, where algorithmic trading is contributing to a trend to break orders down into smaller lots and thereby increasing the number of trades, but also in markets of complex instruments such as credit derivatives. Systems today have to be able to scale up to cope with exponential volume growth, as well as offer the flexibility to bring in new instruments quickly. Furthermore, global organisations are tending to apply their single-system policies to their international operations, so the systems must operate 24x7 globally as well as across asset classes.

As a result, the architecture and design of systems is more crucial than ever before. As Edde at Murex puts it: "Either a company has designed its system to support 24x7 global, high-volume, cross-asset business, or it hasn't, in which case it can't." It is too expensive and/or unreliable to try to make a system that was designed for small-scale operations cope with global business.

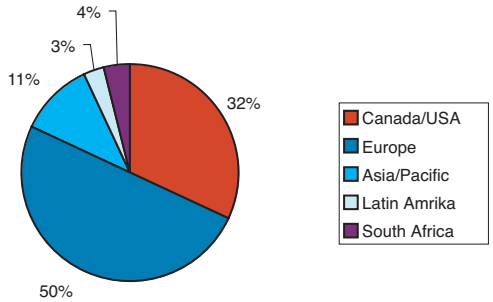
Dembo at Algorithmics makes the same point about risk management systems. One of the biggest challenges in enterprise risk is managing data – something Basel II is underlining. Then there is the need for consolidation of exposures for capital calculations. Meanwhile, credit limit checking and other intra-day risk analysis for global operations requires enormous computation. None of this can be done efficiently without the right architecture and design, says Dembo.

Bank of America's Netzel says that in the trading arena, there are times when infrastructure is the key issue, and times when functionality is more important. "As a business becomes electronically traded, if you don't have a strong infrastructure, more functionality doesn't do you any good," he says. However, in a new business area such as structured products, where the pressure is to be in the market and be innovative, functionality is critical, while infrastructure takes time to build, he says. □

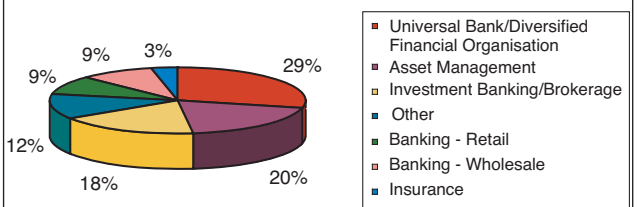
The pinnacle of technology

Rank	Vendor	1st places	2nd places	3rd places
1	Summit	5	4	
2	Front Capital Systems	4	6	2
3	Algorithmics	4	2	1
4	Murex	3	5	5
5	Wall Street Systems	3		
6	Savvysoft	2	1	1
7	Comit	2	1	
8	Imagine	1	2	3
9	OpenLink	1	2	1
10	Moody's KMV	1	1	
11	Sophis	1		2
12	JP Morgan Horizon	1		1
13=	FEA	1		
13=	Calypso	1		
15	SunGard		2	3
16=	Reuters		1	2
16=	SAS		1	2
18=	FitchRisk		1	
18=	Monis		1	
20=	Allegro			1
20=	Numerix			1
20=	RiskMetrics			1
20=	360 Treasury Services			1
		30	30	27

Survey respondents by location



Survey respondents by type of institution



Technology rankings

Market risk

Market risk

40 companies cited

Rank	Company	%
1	Algorithmics	16.5
2	Summit	10.9
3	Savvysoft	9.8
4	RiskMetrics	7.5
5	SunGard	6.9
6	Front Capital Systems	5.9
7	Barra	5.1
8	Imagine	4.5
9	Wall Street Systems	2.7
10	Reuters	2.4

Credit risk

Trading and banking

37 companies cited

Rank	Company	%
1	Algorithmics	22.1
2	Moody's KMV	8.5
3	SunGard	7.0
4	RiskMetrics	6.4
5	Front Capital Systems	5.2

Capital allocation

25 companies cited

Rank	Company	%
1	Moody's KMV	17.9
2	Algorithmics	16.8
3	SunGard	12.5
4	Kamakura	5.4
5	RiskMetrics	5.2

Limit checking

27 companies cited

Rank	Company	%
1	Algorithmics	17.8
2	SunGard	11.6
3	Murex	7.5
4	Reuters	6.8
5	Misys	6.2

Operational risk

Assessment

24 companies cited

Rank	Company	%
1	JP Morgan Horizon	20.6
2	Comit	19.7
3	SAS	9.3
4	FitchRisk	8.7
5	Axiom	6.5

Key risk indicators

24 companies cited

Rank	Company	%
1	Comit	13.7
2	Algorithmics	10.7
3	JP Morgan Horizon	8.8
4=	Axiom	6.5
4=	FitchRisk	6.5

Internal loss data

19 companies cited

Rank	Company	%
1	Comit	12.5
2	SAS	12.1
3	Algorithmics	11.1
4	JP Morgan Horizon	9.3
5	FitchRisk	8.3

Capital calculation

16 companies cited

Rank	Company	%
1	Algorithmics	25.4
2	FitchRisk	16.5
3	SAS	10.4
4=	Axiom	7.5
4=	Comit	7.5

Technology rankings

Trading systems

Cross-asset

35 companies cited

Rank	Company	%
1	Summit	23.3
2	Front Capital Systems	14.5
3	Murex	10.0
4	SunGard	8.4
5	Reuters	7.3

Credit

21 companies cited

Rank	Company	%
1	Front Capital Systems	16.4
2=	Murex	11.8
2=	Summit	11.8
4	Calypso	8.2
5	SunGard	6.4

Rates

21 companies cited

Rank	Company	%
1	Summit	17.5
2	Front Capital Systems	14.9
3	360 Treasury Systems	12.8
4	Reuters	9.1
5	Imagine	6.8

FX

28 companies cited

Rank	Company	%
1	Wall Street Systems	20.1
2	Murex	12.2
3	Reuters	9.8
4=	Summit	7.9
4=	SunGard	7.9

Equity

24 companies cited

Rank	Company	%
1	Front Capital Systems	17.3
2	Imagine	14.4
3	Sophis	12.5
4	Murex	7.7
5	Charles River	4.8

Commodities

15 companies cited

Rank	Company	%
1	Murex	21.0
2	OpenLink	19.0
3	SunGard	15.3
4	GL Trade	8.2
5	New Energy	7.0

Structured products

20 companies cited

Rank	Company	%
1	Summit	17.1
2	Front Capital Systems	12.9
3	Murex	10.7
4	360 Treasury Systems	8.6
5	Imagine	7.1

Trading analytics

Cross-asset

24 companies cited

Rank	Company	%
1	Front Capital Systems	12.6
2	Summit	10.5
3	Imagine	9.9
4	Savvysoft	6.6
5	Bloomberg	5.5

Credit

22 companies cited

Rank	Company	%
1	Front Capital Systems	14.2
2	SunGard	12.2
3	Numerix	9.1
4	Savvysoft	8.7
5	Summit	8.1

Rates

18 companies cited

Rank	Company	%
1	Savvysoft	18.6
2	Front Capital Systems	15.5
3	Murex	9.2
4=	Bloomberg	7.2
4=	Wall Street Systems	7.2

FX

19 companies cited

Rank	Company	%
1	Wall Street Systems	14.1
2	Savvysoft	10.5
3	Reuters	9.2
4	Fenics	7.5
5	SuperDerivatives	6.3

Equity

19 companies cited

Rank	Company	%
1	Imagine	21.4
2	Monis	14.7
3=	RiskMetrics	9.1
3=	Sophis	9.1
5	Barra	8.0

Commodities

9 companies cited

Rank	Company	%
1	FEA	26.1
2	OpenLink	22.1
3	Murex	17.5
4	Encompass	9.7
5	New Energy	8.2

Structured products

17 companied cited

Rank	Company	%
1	Savvysoft	26.1
2	Imagine	13.0
3	Front Capital Systems	9.8
4	Murex	7.5
5	Wall Street Systems	6.5

Front- to back-office

Cross-asset

20 companies cited

Rank	Company	%
1	Summit	16.5
2	Murex	11.8
3	Imagine	10.9
4	Front Capital Systems	9.9
5	360 Treasury Services	7.4

Credit

15 companies cited

Rank	Company	%
1	Calypso	16.3
2	Front Capital Systems	13.0
3	OpenLink	11.0
4	Murex	10.6
5	Summit	9.0

Rates

16 companies cited

Rank	Company	%
1	Murex	21.8
2	Summit	14.5
3	Front Capital Systems	13.7
4	360 Treasury Systems	8.1
5	Imagine	7.3

FX

15 banks cited

Rank	Company	%
1	Wall Street Systems	17.8
2	Murex	14.4
3	Reuters	12.4
4=	Summit	9.2
4=	SunGard	9.2

Equity

10 companies cited

Rank	Company	%
1	Sophis	31.6
2	Reuters	21.1
3	Imagine	14.8
4	SunGard	9.8
5	Front Capital Systems	5.3

Commodities

9 companies cited

Rank	Company	%
1=	Murex	22.2
1=	OpenLink	22.2
3	Allegro	14.3
4	Encompass	12.3
5	New Energy	8.3

Structured products

12 companies cited

Rank	Company	%
1	Summit	13.9
2=	Front Capital Systems	12.5
2=	Murex	12.5
4	SunGard	9.7
5	Wall Street Systems	8.3

Risk surveyed technology users globally in November for its inaugural Technology Rankings and received 351 valid responses. Respondents were asked to nominate the firms that provide the best offering across different markets such as market risk, credit risk, operational risk, trading systems, analytics and front- to back-office systems based on the functionality, usability, performance, return on investment and reliability provided by the offerings of technology vendors. Nominated technology companies were awarded three points for a first-choice vote, two for a second-choice vote and one point for a third-place vote. Only technology end-users were allowed to vote. *Risk* verifies the validity of votes and discounts invalid votes.