

Misys Risk Vision

The complete Risk Management solution



Risk management today is more demanding than ever. Therefore the job of a risk manager has evolved as well. Risk managers are no longer singularly focused on the credit or treasury department, and the role is no longer defined as only preventing losses or producing regulatory numbers.

The Complete Risk Management Solution

Risk Vision is an integrated and functionally advanced risk solution, delivering risk measurement and management at enterprise and departmental level, well suited for Banks, Hedge Funds and Financial Intermediaries. Risk Vision supports accurate pricing of numerous trade types, accurate exposure measurement and risk management measures like Value at Risk and Economic Capital. Risk Vision also has various decision support tools like 'what-if' analysis, scenario stress testing and sensitivity analysis.

Risk Vision uses state of the art risk estimation techniques like Monte Carlo, historical simulations and parametric approaches. The Risk Vision suite also includes a highly flexible and advanced 'Exposure and Limit Management' module which is fully integrated with the risk calculation engine. A uniquely flexible solution, Risk Vision is focused on supporting value management and regulatory compliance within a global financial institution through accurate, real time identification, measurement and control of exposure and capital.

All financial institutions face mounting complexity, fierce competition, and continual consolidation. Managers expect to be able to quickly and accurately evaluate the impact of risk on current and future performance. Regulators expect more stringent risk measurement standards to be followed. Shareholders expect the best use of capital through concentration on the most efficient sources of profit.

Today, risk management technology is expected to provide a competitive edge, a regulatory reporting framework, a global information pool – as well as providing a 'safety net' supporting the financial viability and soundness of the institution. Risk management solutions today must deliver more information, more quickly in a multi-faceted world of complex interactions: no wonder there are so few leading risk solution providers.

The Misys value advantage

The strength of Misys in risk management

Misys Solutions for Treasury & Capital Markets is the leading global provider of banking solutions. The dedicated Risk Group focuses exclusively on the provision of top quality risk management solutions to banks and other financial institutions around the world.

For more than a decade, while other financial software providers were focused primarily on market risk solutions, Misys has recognised the growing need for global, integrated risk management. This vision, coupled with substantial investment, has made us one of the leading suppliers of risk management solutions and services.

We have created a portfolio of market leading components for all aspects of risk management, which are integrated to provide Risk Vision. Creating a leading risk application is highly resource intensive. Misys Solutions for Treasury & Capital Markets benefits from the stability of being one of the fastest growing parts of the leading application software and solution provider, Misys plc. Quoted on the London Stock Exchange and one of the top technology companies in the FTSE 250, Misys produced a total revenue in the 2007-2008 financial year of £492m.

Vision of managing global risk

Like all parts of Misys, the Risk Group is uncompromisingly customer-focused, and our commitment to our risk management clients is very clear. We continue to enhance our Risk Vision product suite in the most advanced way by:

- + anticipating regulatory and market demands
- + leading the market with risk methodology
- + harnessing our global delivery capability
- + delivering competitive advantage to our clients.

Our focus on excellence of development, breadth of risk function, and global availability are just some of the key factors that set us apart from our competitors.

Effective capital management by the management of risk bearing capacity is a – perhaps even ‘the’ – central function for financial institutions. Yet risk management today is not widely viewed as a vehicle for competitive advantage. Senior management’s perspective is too often that risk is something negative to be constrained, controlled, limited and avoided if possible.

But this view of risk is changing and will change – not because of any philosophical or theoretical argument, but because of basic competitive economics. Financial institutions, indeed all corporations, operate in an increasingly global and competitive world. There are few, if any, guaranteed market niches of high profitability left. Financial institutions therefore must operate at lower cost.

Firms with financial management that view risk bearing capability as a positive resource to be exploited will be the thriving financial institutions of the future. Risk will come to be viewed as a key resource to be efficiently managed and as a vehicle to ‘create value’ for the institution.

Managing the shape of uncertainty

Risk management is the management of areas of uncertainty. Risk management systems must use advanced mathematical models and flexible tools to provide clear indications of the most likely and least likely events - whether its losses, profit and loss or exposures. All financial institutions need to maintain their reputation by being able to manage their risk and reward effectively; so senior executives, general managers, traders and risk practitioners all need to use risk tools to make better informed decisions.

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Improved Risk Control can be the key ingredient separating the winners from the losers.

The Banker

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From risk management to shareholder value maximisation

Improved business performance

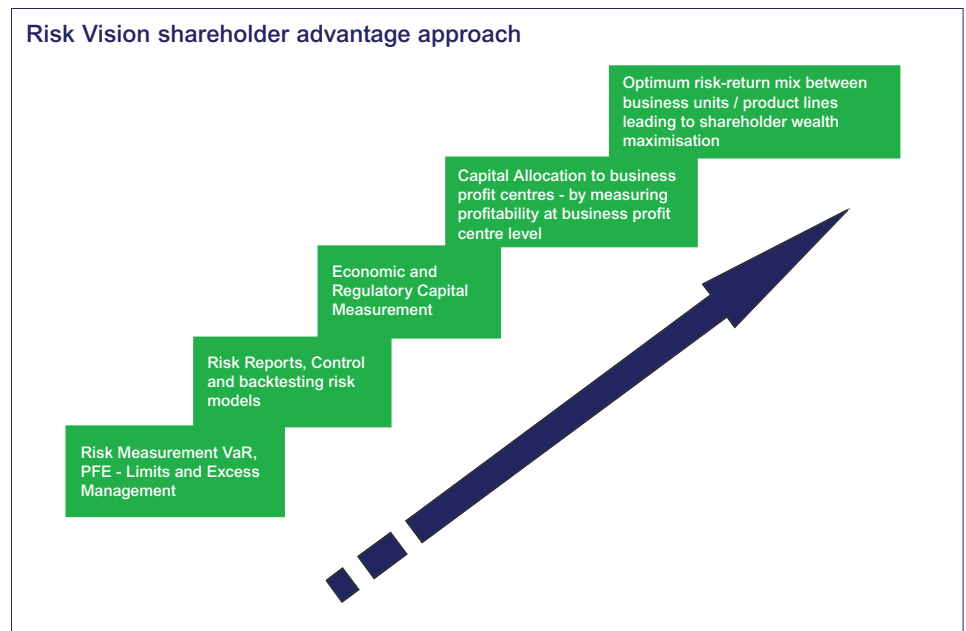
The risk management system must provide the framework to allow for the optimum use of scarce bank capital, within regulatory capital management guidelines. In this role, risk management provides the essential 'business performance linkage' between the back, middle and front-office management, and the bank's overall financial reporting systems and procedures. Only advanced risk management can provide the necessary risk-adjusted information to support the dynamic decisions that a bank must make to grow: to invest in business lines that increase profit and grow shareholder value, and divest those business lines which do not.

Shareholder value management

The bank's 'value perspective' should track each major business unit's risk/return profile, to measure the contribution to the total firm value of the whole bank's portfolio. Value management essentially comprises the three processes of:

- + Capital allocation
- + Performance measurement
- + Bank-wide valuation.

Risk management is a vital component in all three areas, and Risk Vision provides functionality to address all of them.



All banks today operate a multitude of different systems to manage the various business activities of the bank. To see the overall risk of the whole business clearly, it is essential that all transactions are collected and analysed together, no matter where and how these transactions arise. Risk Vision components work together or separately to provide a full set of functionality in all areas of risk measurement.

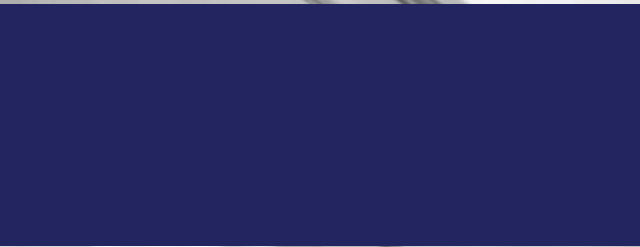
Only by viewing risk bearing capacity as a positive resource and optimising the use of that scarce resource, will any financial institution use capital most efficiently and thus most profitably.

The desire to measure the cost of capital to a trading position, or to provide an integrated view of the bank's global credit portfolio to allow macrohedging of risk concentrations, means sophisticated economic capital calculations must be performed in near real-time. The movement towards marking-to-market loan portfolios is having a significant impact on P&L volatility, and increasing the need for systems which have the performance to model the extended tenor of loans.

From pricing an individual trade, through valuing a portfolio, to calculating the bankwide Value at Risk (VaR), or managing global limits, Risk Vision has a component to meet every risk management requirement of the enterprise.

How Risk Vision helps in shareholder value creation

1. Risk Vision supports value creation by accurately identifying, measuring and controlling potential losses, and thus avoiding the loss of value.
2. The use of Risk Vision to provide timely risk measurements and responsive risk analysis enables firms to engage in business that is constrained by slow or inadequate risk information.
3. The flexibility and comprehensive reporting provided by Risk Vision gives management more understanding of, and comfort with, their current risks. This enables them to undertake more business that fits within the firm's 'risk appetite', leading to more profit.
4. The advanced economic capital calculation abilities of Risk Vision give accurate measures of risk, and thus of the capital needed to support that risk. Incorrect measures of capital, due to incomplete or incorrect capture of diversification, will lead to a waste of capital and loss of profit opportunities. Proper measure of the diversification in a portfolio will enable a firm to use capital most efficiently.
5. Ultimately the most important, Risk Vision can allow the management of the future to 'optimise' their allocation of risk – and the resulting capital – to the most profitable areas of business.



Risk management





Risk management is and will remain very much bound up with data management”

Global Association of Risk Professionals



Advanced features of Risk Vision include:

- + Full support for both Corporate and Treasury across all components
- + Global On-line Credit Risk, Market Risk and Limit Management
- + Real-time Trade Capture, Exposure Calculation and Pre-deal Checking
- + Integrated with Misys Opics for straight-through processing and Risk Management
- + Full Support for Credit Mitigation from Mark-to-Market Resets, to right-to-break, to Netting, Collateral and CSAs
- + On-line Excess Management, multi-stage Limit Workflow
- + Full Range of Exposure Methodologies: Factors, Mark to Market (MTM) + add-on, Advanced Analytics, including Value at Risk, Historical and Monte Carlo simulation can all co-exist
- + Fully parameterised Risk Run set-up for structured or ad hoc analysis
- + User-friendly Enquiry screens with graphics, contributions and detailed drill-down, regardless of exposure calculation methodology
- + On-line, context-sensitive help with full searching and cross referencing capabilities

Risk Vision components

Risk Vision Data (RV Data) provides complete ownership of the consolidated data for risk management and other applications. Access to timely and accurate data is the key to successful risk management. The Risk Vision integrated solution is built upon a sophisticated, extensible and robust open data base.

RV Data supports all areas of the bank’s treasury and corporate business – including support for complex derivatives, credit lines, syndications, facilities and collateral. All required static data can also be entered or imported, including counterparties, credit ratings, all legal netting documentation and CSAs.

Real-time bidirectional APIs, which work with middleware tools, provide a straightforward method for extracting and mapping data from any source system.

Risk Vision Carma (RV Carma) is a powerful simulation engine with a full range of methodologies: Parametric, Historical and advanced Monte Carlo. Results include market or credit risk for any counterparty, any portfolio, or the bank’s complete business, providing maximum diversification benefit. Collateral and netting are fully modelled. The outstanding performance of RV Carma’s unique internal architecture employs full multi-factor Monte Carlo with no need for compression or basis instrument mapping.

Distributions of potential future exposures are generated at each forward point by simulating the stochastic evolution of multiple market factors, and valuing each transaction at every node of every path. Sets of volatilities, correlations and other parameters provide full control of assumptions. Relative diffusion processes

are employed, including mean reversion, vital to avoid exaggerating risk over the long horizons of credit risk analysis. Default probabilities, including rating migrations and recoveries, are used to generate expected and unexpected losses and to calculate Economic Capital. Advanced algorithms are used to allocate Economic Capital to various constituents – from counterparty, to country to other risk-entities.

Risk Vision Exposure (RV Exposure) offers complete management of exposures across the full range of a bank’s activities and locations. Limits can be set against any ‘risk entity’ (for example, counterparty, country, industry etc.), and any exposure can be instantly viewed, with drill-down to trades and contributions. Real-time calculation of exposures, flexible graphic enquiries, together with high speed pre-deal checking all combine to support efficient global limits.

User-defined calculation rules, including the use of any analytic or simulation result, can take into account netting, collateral and aggregation, resulting in dramatically improved limit utilisation. Navigation of exposures to any point in the bank’s hierarchy, limit workflow control, plus on-line management of excesses and warnings, all ensure that the system can be tailored to any bank’s specific policies. Basel II calculations are supported with assignment of Probability of Default (PD) and Loss Given Default (LGD) factors and calculation of Exposure at Default (EAD).

Risk Vision Workbench is the Risk Managers toolbox from where ad hoc simulations can be run, trades can be grouped according to various criteria, user-defined results grid can be setup (like pivot tables) and any analysis can be performed on them – from full Monte Carlo simulation for market or credit VaR, to Potential Future Exposure analysis, to stress testing, to sensitivity analysis, to cashflow analysis, to back testing analysis. Further more, the VaR results can be spilt into its constituents and contributions can be analysed using Incremental and Marginal VaR approaches.

Stochastic Parameter Calculator (SPC) is a tool for doing time-series analysis. Monte Carlo simulations need a lot of parameters which have to be estimated from time-series data using advanced statistical techniques. The SPC calculates various parameters such as correlation matrix and its Cholesky decomposition, volatility, mean-reversion parameters, skewness and kurtosis, and other parameters from historical time-series data for use in RV Carma. The SPC uses the Principal Component Decomposition (PCD) approach to ensure that the computed correlation matrix is positive definite. The data parameters that the user can control include which data series to include, the calculation parameters

(including time horizons), exponential weighting factor, adjustments for overlapping returns, mean-reversion parameters and adjustments for non-synchronous data. The SPC also cleans the data before performing calculations (removes outliers, fills in missing data according to various user-specified rules).

Risk Vision Pre Deal Check is a web based “thin client” trader tool for real-time pre-deal checking against any market or credit risk limit. Any trade type can be tested against any or all limits before execution. A full analysis of all exposures and utilisations which would result can be displayed, including graphs.

Risk Vision web based pre-deal check interface.

Predeal check response - “check failed”, so limits impacted are shown.

Risk Category	Risk Point	Limit Type	Org Line	Stage	Instrument	Excess Reason	Excess Amount	Limit Amount	Utilisation	Exposure	Start Date	End Date	SM
CPARTY	PDC_PARENT	HL_B	INT	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	26042004	20042005	0-1
CPARTY	PDC_PARENT	HL_D	INT	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	01052005	25042007	1-2
CPARTY	PDC_PARENT	HL_B	INT	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	26042005	31122999	3-3
CPARTY	PDC_PARENT	HL_D	INTERNAL	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	26042004	20042005	0-1
CPARTY	PDC_PARENT	HL_D	INTERNAL	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	01052005	25042007	1-2
CPARTY	PDC_PARENT	HL_B	INTERNAL	PROFORMA	CHF	NewTrade	18,496,667	18,496,667	0	18,496,667	26042005	31122999	3-3
CPARTY	PDC_PARENT	HL_N	INTERNAL	SEWALIST	GBP	NewTrade	23,496,667	20,000,000	43,496,667	43,496,667	26042004	20042005	0-1

Trading room requirements are simple: buy low, sell high. Regardless of the instruments traded, from the simplest loans to the most sophisticated OTC derivatives, the key is making money through opportunistic buying and selling. The challenge is to enable the traders to execute this strategy within the bank's risk constraints.



Risk Vision's optimised Pre-Deal
Check response time - 0.15 seconds



Risk Vision for the trading room

Traders need the most accurate and up-to-date information to assist in making their trading decisions – details of positions, market values, cashflows and various risk statistics – plus the tools to assist with pricing and hedging. And all trading must meet predefined controls: limits – either credit or market – that can be checked in real time before the trade is done.

Real-time optimised enquiries

Risk Vision recognises that traders and risk analysts in the trading room cannot afford to waste time. So Risk Vision has optimised enquiries, specifically designed to summarise just the information the traders really need to know. Graphical displays of limit and exposure information can include detailed potential future exposure (PFE) profiles.

Default settings let each trader have personalised set-up, including preselected dates of interest for settlement exposures. Limits and utilisations for any selected counterparty are shown in a choice of formats, together with related country and industry limit information.

Pre-deal checking and 'what-if'

The on-line pre-deal limit checking feature of Risk Vision is a vital tool that enables many of our customers to operate global limits across multiple trading locations. Any potential trade can be entered prior to execution for real-time calculation of all exposures which would result. Dealers receive an immediate response on whether the proposed trade will break any credit or market limits. Full analysis of the PE profile of the proposed trade and the impacted portfolio can be seen. A 'maximum notional' value can be returned automatically so that dealers are notified of the maximum trade that can be executed.

The use of **'thin client' web-based technology** ensures this facility can be rolled-out quickly and easily across many trading positions.

In today's fast moving markets, financial institutions have a growing need to analyse their consolidated risk data in complex and often unpredictable ways. Whether satisfying local operational decisions, head office reporting, or external regulators, banks have a seemingly endless need for new reports and ad hoc analysis as exchange rates, yield curves, volatilities and correlations change.

Features include:

- + Market Data Management – real-time data for valuation scenario analysis, etc.
- + Scenario Definition – user determined yield curves, exchange rates, volatilities etc., combined for stress testing and 'what-if' analysis
- + Portfolio Selection – user filtering of trades or groups of trades to be included in analysis
- + Analysis Selection – user selected analysis runs, e.g. Historical/Monte Carlo simulation, Parametric VaR, Portfolio Risk Statistics, etc.
- + Cash flow analysis – user selected aggregation of resultant cashflows and drill-down
- + Results View selection – users can select how they want to view results (Pivot Table Approach), the attribute in the row, column, results grid and aggregation tree can be selected.

Ad hoc analysis using Risk Vision Workbench

Risk Vision Workbench allows real-time ad hoc analysis across the full power of the integrated Risk Vision solution. Users can display risk calculations, including market risk statistics, for single trades or selected portfolios, using results calculated by all available analytic engines, from straightforward mark-to-market (MTM), bp sensitivity, duration, greeks, to full multifactor Monte Carlo simulations.

Risk Vision product coverage

Risk Vision can price, measure exposure and simulate a wide range of products; from basic to complex instruments.

- + Capital and Money Market instruments including equities, fixed rate notes, cash balances foreign currency deposits and various kinds of repurchase agreements
- + Swaps including various kinds of interest rate swaps, constant maturity swaps, spread lock swaps, cross currency swaps, quanto swaps, equity swaps and commodity swaps
- + Options including various kinds of interest rate options, caps, floors, collars, binaries, barriers, double barriers, compounds, swaptions, constant maturity swaptions to contingent premium options to average price/strike options to single touch/double touch options to spreadtions and also various kinds of commodity options
- + Risk Vision also supports different kinds of credit derivatives and credit mitigation instruments, covers, collaterals and guarantees.

Risk Vision's product coverage ranges from the simple to the complex:

- + derivatives for the trading books
- + instruments for the banking book
- + products for the retail segment.

Risk Vision for portfolio managers and middle-office

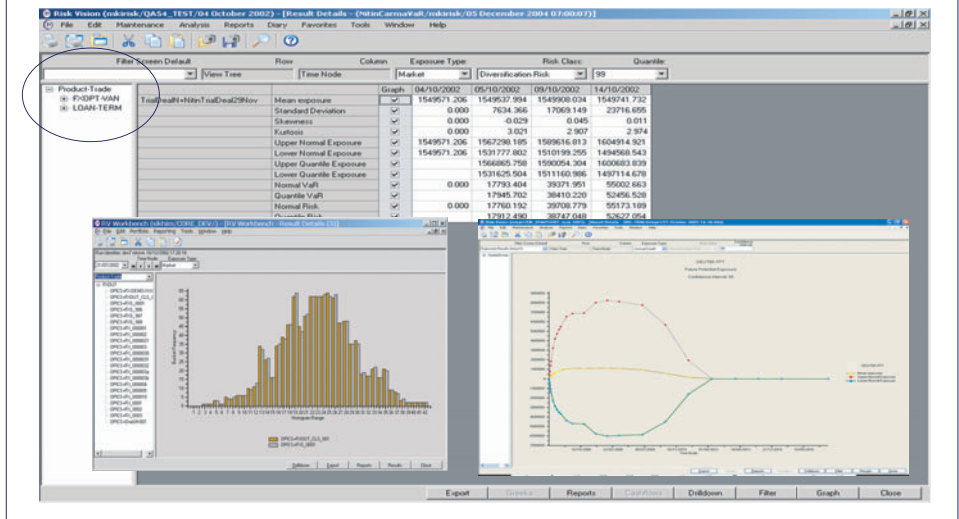
- + up-to-the-minute profit & loss figures
- + intra-day VaR
- + current exposures to credit quality potential exposures as these credit qualities change over time ('credit migration').

All these combine to put pressure on the 'middle-office'. Fund managers also need to calculate performance analysis against internal or external benchmarks.

Resolving the middle-office challenges

The tools of Risk Vision are designed to assist in bringing together all aspects of market or credit risk from all parts of the financial institution to meet this objective. In all cases, the financial institution has positions in a variety of trades with a value today and subject to value fluctuations in the future. The institution needs to understand how this value can fluctuate – in currency value terms or in percentage terms – and how to measure the consequence of this change. The regulators want to know the worst cases, consequences and survivability, and the business managers need to know the profitability.

Example of trade-level statistics from a full Monte Carlo exposure simulation – histogram buckets and potential future exposure graph showing upper and lower normal exposure. Also displayed is the user-friendly aggregation tree on the results grid (circled)



To help resolve all these challenges, Risk Vision provides:

- + Extensive risk and exposure analysis and reporting against any part of the consolidated data pool
- + Structured and ad hoc execution of analysis
- + Graphical representations of potential exposures, drill-down to individual transactions and contributions
- + Calculation of exposure to any risk entity or at any risk point: country, region, counterparty, product, commodity, currency, industry, issuer, guarantor, credit rating, etc
- + User-selection of risk statistics of interest
- + Portfolio 'slice and dice', with immediate drill-down to progressively more detailed analysis of risk statistics.

Sophisticated real-time analysis

Risk Vision provides a complete range of advanced analysis options, including multi-factor Monte Carlo, multi-scenario stress testing, historical performance simulation (back testing), ad hoc scenario analysis and the examination of extreme loss scenarios. Sensitivity analysis can be performed at any level of trade or portfolio aggregation. The impact of real or hypothetical trades on actual or trial portfolios can also be assessed.

Concentration limits can be consistently applied, according to the bank's own policy, taking into account exposure size, maturity and credit quality of obligors or countries. Netting agreements, Credit Support Annexes, aggregation policies, and collateral are all taken into account as required.

Management of Credit Risk is perceived by many as both the biggest cause of potential problems and one of the most challenging risks to address. At worst, mismanagement of credit can lead to damaging capital losses and a downturn in shareholder value. More positively, constructive management of credit risks can be used to drive the business forward and optimise reward.

Risk Vision for credit risk managers

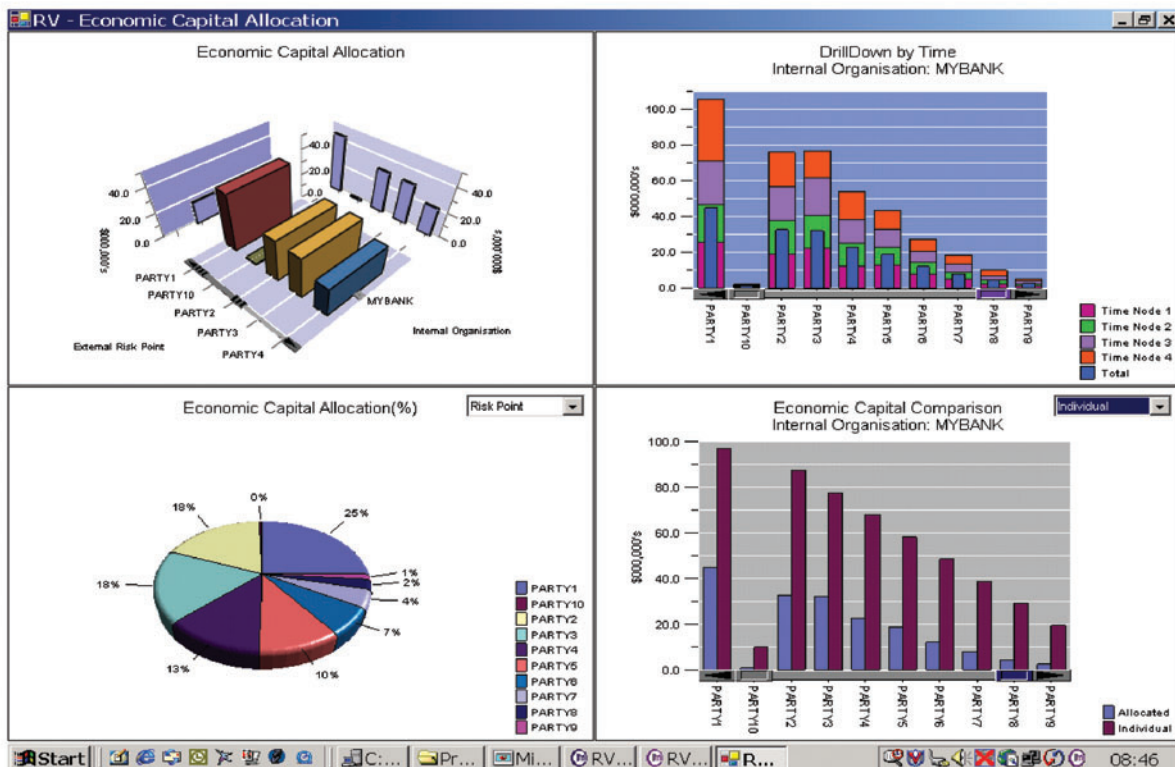
The renewed focus on credit risk is partly fuelled by the changing nature of counterparty risk itself, including the increased opportunity for counterparty risks to offset each other across business activities. To provide effective shareholder value, credit management must bring about a consolidation of credit exposures, facilitate the optimal use of limit capacity and offer real-time control.

All business lines consolidated

Risk Vision supports all business lines across the bank, and allows credit risk to be measured and managed at all levels of the business from group to subsidiary

to branch, down to desk and dealer. Limits, credit lines and facilities can all be established, and resultant exposures calculated and monitored in real time. Categories of risk that can be managed include: customer, industry, location, product, portfolio, credit rating or any user-defined attribute. The risk in each category can be aggregated by rolling-up exposure through a hierarchy. The system can reflect the risks associated with exposure concentration and the probabilities of credit default, as well as providing a measurement of economic capital covering credit losses and potential future exposures.

Risk Vision Economic Capital output reports



With Risk Vision, any institution – small or large – can quickly meet its initial objectives, then progress through to increasing sophistication, simply by changing the user-defined parameters within Risk Vision.

Advanced credit calculations

Risk Vision supports a wide range of risk measurement calculations, ranging from simple, such as notional or percentage of notional; through MTM plus a range of flexible add-ons; to full simulation-based Potential Exposure profiles. Risk Vision operates as a truly advanced global limits system, by allowing any analytic or simulation-based risk result to be used as a limit exposure. This allows any institution to migrate easily from its current approaches through to best practices.

Credit mitigation

Credit mitigation is a vital technique to reduce credit exposure, allowing for effective use of limits and therefore capital. Risk Vision has extensive support for all forms of credit mitigation, including netting, collateral, Credit Support Annexes, guarantees, credit derivatives, right to break, Principal resets, etc.

Economic capital

In addition to calculating exposure, Risk Vision can also calculate economic capital. Economic capital can be calculated using a full Monte Carlo simulation with default correlations specified as for CreditMetrics™, or wider to include industry-geography groups, market factors and economic indices. Economic capital calculations allow the allocation of capital (and limits) to different business areas.

Importantly, Risk Vision is not a 'black box': any exposure can be dissected via detailed drill-down capabilities, all methodologies are published, and results are transparent to allow clear interpretation of output by risk practitioners and management alike.

Risk Vision support for Basel II Accord

Risk Vision, designed as an institution-wide risk measurement tool, supports the capture of all trading and banking book transactions, together with a rich set of rules-based exposure calculations and analytical functionality. This makes Risk Vision ideally suited as a firm base for any bank seeking to meet the demands of the new Capital Accord proposals.

Risk Vision's advanced abilities to calculate economic capital are also relevant to the Basel Capital proposals.

Risk Vision provides specific support for the latest Basel approaches through a full range of existing features, including:

- + capture of a complete spread of trading and banking book transactions
- + categorisation of borrowers and assignment of ratings to borrowers
- + assignment of Probability of Default (PD) factors to borrowers, either explicitly or implicitly through links to ratings
- + calculation of the Exposure at Default (EAD) based on transaction characteristics, including maturity
- + application of a Loss Given Default (LGD) factor based on transaction type
- + calculation of the exposure offset given by the credit mitigation techniques (through Collateral Guarantees and CSAs, Credit Derivatives, Enforceable Netting Agreements, etc.).

Risk Vision operational advantages

Component architecture with flexibility

Risk Vision is comprised of a set of best practice components that work closely together or separately to provide the required breadth of risk monitoring and control. Perhaps one of the few truly integrated risk solutions in the market, Risk Vision offers measurement of credit and Market risks, together with comprehensive limit management. All components operate on a consolidated database.

Any financial institution, however small or large, can select their initial risk focus, install that component, then smoothly evolve to include other components with additional functions and measurement techniques.

Operational robustness

Risk Vision is not a monolithic system; nor is it a complex and unwieldy mix of unrelated systems that the user is responsible for integrating. It is not a costly 'do it yourself' tool-kit, nor an inflexible bureau dictating a limited range of functions and loss of control of key organisational data.

Risk Vision uniquely combines extensive flexibility with the ease of installation and robust operability of an application 'package'. Risk Vision is delivered, installed and operated as a whole solution, but configured to contain only the modules required by each specific bank.

Today's market is moving towards integration of risk from market to credit while encompassing a full range of risk types. A practical approach is needed to measure risk across different trading areas, all geographical units and departments of the bank.



Financial institutions today operate in a global 24x7 environment. Offices or clients are spread across multiple locations in different time zones. A variety of different systems and hardware platforms, each providing important data, must be consolidated to give the overall risk profile of the organisation.



Complete database

To provide users with the closest fit to their various operational business requirements, most banks have a range of specialist front and back-office applications for particular needs. However, the challenge of providing integrated risk measurement now means interfacing all source systems into a single data storage.

Risk Vision is centered around a flexible relational database designed specifically to hold all the data required for running the risk analysis, simulations and limits components. All transaction types, whether corporate loans or complex derivatives; all relevant static data, from counterparties to rating codes; and all market data are held in a structured format which is nevertheless easy to extend.

Results are stored efficiently back into the database for direct access by enquiries, reports or extract.

Real-time application interfaces

Risk Vision has been designed with integration in mind. It provides published 2-way application programming interfaces (APIs), which allow it to integrate fully within a bank's own architecture and interface easily with incumbent operational systems:

- + real-time, periodic or batch feeds
- + fully middleware enabled, with available drivers for all the key middleware products
- + HTML, XML formats supported
- + import or direct entry of all transaction and supporting static data
- + 'building block' APIs supporting structured and complex trades
- + generic trades, user defined codes, pre-calculated exposures, and MIS values combine to allow virtually any transaction to be modelled into the database.

Interfaces to Risk Vision can even include third-party risk engines, with APIs supporting the real-time import of externally calculated exposures or PFE values. External engines can optionally directly access Risk Vision's 'Navigation Engine', for mapping of trades to limits/portfolios, ensuring consistency between Risk Vision and the external portfolio valuation engine.

Integration must mean much more than a series of advanced analytical tools: the risk system must deliver sophisticated analysis, but with high performance, and without jeopardising security and integrity. Today's risk system needs to meet stringent audit requirements, while allowing secure access to the wide-ranging risk data in a timely and readily understandable manner.

Security and audit

Risk Vision operates in a technically secure Unix and relational database environment. Specifically Risk Vision Security and Audit functionality meets the security demands of some of the world's most advanced financial institutions. Extensive user access control at a functional, data and technical level is provided by employing passwords, encryption and user profiles within an advanced tokenbased security approach.

All changes to the database, however generated, are automatically recorded in separate, secure audit tables. This protects the integrity of the complete set of data and provides detailed audit reports.

All pre-deal checks are recorded. Details of who performed the check, when, and the result – success or failure of the check – are all logged in real time, removing any doubt about whether a trade was checked or not.

Specific security features include:

- + Users can be individually or collectively allowed to, or restricted from, performing certain functions
- + At a data level, users can be explicitly or implicitly confined to viewing and/or managing data depending on their location or the counterparty in question
- + Second user ('4-eyes') authorisation can be exerted on all potential credit enhancing actions
- + Password monitoring allows recording of failed attempts and prompting for password changes.

Risk Vision architectural edge

Architecture for global operation
Risk Vision is developed with global requirements in mind.

All components can be implemented fully integrated to provide real-time access to any limit, exposure, portfolio or trade analysis. Risk statistics calculated by any engine can be used automatically as the exposure for any limit.

At the same time, the component architecture of Risk Vision is fully scalable. It is eminently suitable for departmental solutions, phased implementation, or for local or smaller banks needing to combine advanced function with straightforward operation.

Architectural strengths include:

- + Advanced multi-tier Client/Server architecture
- + Web-based and thin client user access
- + 24x7 read and update processing
- + Single or multi-hub global network implementations.

Leading technology

Risk Vision harnesses all the benefits of advanced technology and design, including the Internet, PC, Unix, object oriented and powerful Relational Databases.

Designed for high performance

Risk Vision has specific design points to provide outstanding performance and scalability, even when large volumes are coupled with complex best practice risk calculations.

- + Interactive operational design provides robust real-time trade capture, limits monitoring, exposure and analytical calculations
- + Open, flexible relational database is implemented on standard Sybase RDBMS giving easy access to all risk data and results
- + Object-oriented technology with multi-threading simulation and exposure calculation engines delivers world-beating real-time performance
- + Multiple engines, including support for third party engines, are supported via high-speed internal bus architecture
- + Retail Loan Aggregation component, to aggregate very high volumes of retail loans according to user-defined attributes, while preserving risk characteristics.

Market practitioners monitor financial risks and returns using primarily qualitative and judgmental approaches. Financial Engineering supplements these approaches by the application of quantitative methods

The people behind Risk Vision

Superior financial engineering team

As a world-class product, Risk Vision requires both considerable research and development investment and the 'thought leadership' which only comes from high-calibre people with leading edge market and product knowledge and experience. The Financial Engineering (FE) & Quantitative Analysis team in Misys Risk Group consists of world-class academics with exceptional track records in mathematics, finance and computer science.

The team regularly works in close collaboration with top-tier universities, engaging in research across many areas of mathematical finance to provide leading edge client driven solutions. Most recent contributions have been made in extreme value theory, making use of widely available non-normal data to calibrate multidimensional tail dependence models. This work has important implications for the field of risk management and is of particular significance to the valuation and risk analysis of credit derivative instruments. Other areas of research include: implied volatility dynamics, contagion modeling and analytical credit derivative valuation techniques.

For a system as central to business success as a risk solution, selecting a supplier with a proven track record of success is almost as important as the decision on whether the software matches the business needs.

Financial institutions quite rightly probe the ability of vendors on many key issues. Does the vendor have the right experience to understand the bank's needs? Do they have the skilled people to translate those needs into a structured implementation project? Will they control the project to ensure that it does not start to slip or creep out of control? And – most important of all – will the project succeed?

Implementation experience

No ingredient is more essential to ensuring success of a complex global project than genuine implementation skill. The global Misys Risk Group has wide experience of successfully managing large, complex and geographically spread risk management projects.

Implementing projects successfully within today's financial environment presents a number of complex challenges. Implementation skill and experience is one of the most important considerations that a bank must take into account when choosing a supplier for any risk solution.

Planning and control

Misys Risk Vision's implementation record is based on a sound and proven project methodology, applied in a controlled fashion. The planning stage of the project is always critical to the success of any implementation, so the client and Misys work together to build a joint implementation approach, which is tailored to the client's particular needs and requirements.

To ensure success throughout the project life cycle, our methodology focuses on:

- + agreeing project scope
- + careful management of project tasks
- + early identification and mitigation of implementation risk
- + clear change control practices.

Finally, our use of experienced resources ensures that lessons drawn from previous implementations are successfully applied in current projects.

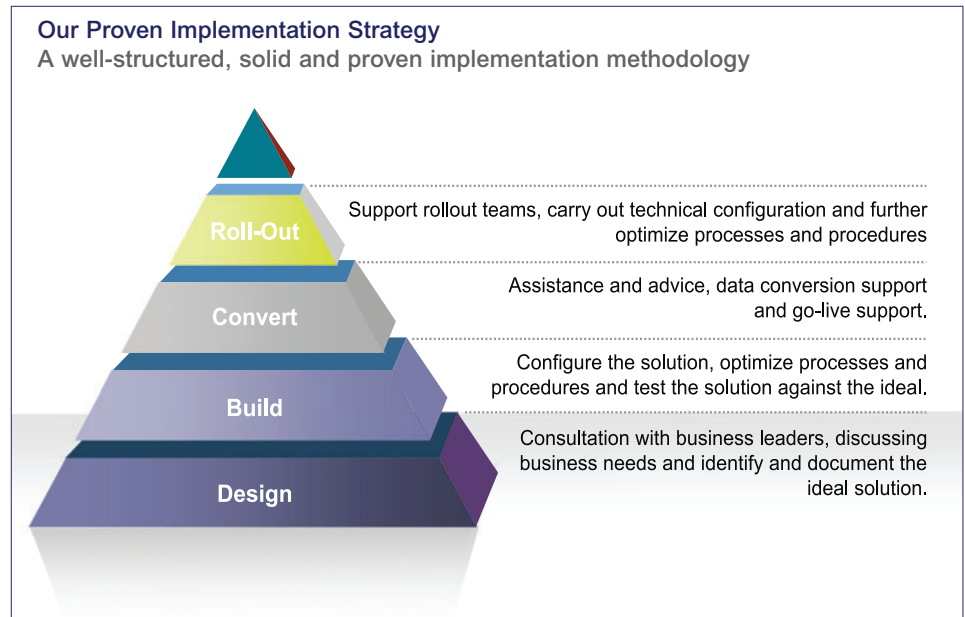
Dedicated client support team

Misys devotes substantial resources and expertise to on-going support and maintenance of our risk products. A dedicated Client Support team within the Risk Vision solution centre ensures that issues raised by existing clients receive prompt attention without disrupting development plans. Client Liaison officers have responsibility for ensuring that all implementations at our clients' sites continue to be successful after the initial installation.

Misys have experienced staff around the world. Post implementation support is provided at all levels and can include 24x7 cover if required.

Development to address market needs with YOU in mind

Misys invests continually in all aspects of the Risk Vision product suite, building on our own research and in response to clients' requests. Our approach to the development of client requests is based on a mutual partnership approach, with a clear recognition of the value that our client banks make to the growth of Risk Vision. We have a clear and published release schedule, all sponsored enhancements are agreed with the client, and all developments are taken into core product.



Our commitment to providing successful risk systems does not end with live running. First class support for business critical systems such as Risk Vision is essential. The Misys Risk Group is committed to providing on-going support that ensures our application solutions are available 24x7 and perform as required throughout the years.

User Group

Risk Vision has an active and supportive User Group, who assist with prioritisation and specification of enhancements. This enables us to bring the maximum content and flexibility into each new development, whilst still addressing specific needs of individual banks. Members of the User Group benefit not only from the regular meetings, but also from on-going contact with the other banks.

About Misys

Misys is a leading global software product and solutions provider, with over 4,500 employees serving customers in more than 120 countries. Misys has more than 25 years experience in developing software products for major industry-specific markets and combines in-depth understanding of customers' industries, markets and needs with operational skills in product development and product and talent management.

Misys Risk Vision is

- + **Market Risk: VaR – Monte Carlo, Historical Simulation, Parametric approaches, stress testing and sensitivity analysis.**
- + **Credit Risk: Credit VaR, credit migration, spread pricing, exposure distributions, potential future exposures**
- + **Limit Management – Process and Control: Exposure management, limits, excess management, enterprise wide, limits on any risk entity, fully configurable.**
- + **Drilldown and Reports – VaR drill down, incremental VaR, Marginal VaR, Risk Decomposition, Numerous reports, Database Information Layer – limit activity snapshots, limits and exposure time series analysis.**
- + **Capital Management and Shareholder Value Maximisation: Loss Distributions, Economic Capital, Capital Allocation, Risk-Return analysis.**

Misys Risk Vision – the complete risk management suite.



Leading technology



For further information on
Misys Risk Vision, please
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or visit:
www.misys.com

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