

Operational Risk Information System



WHY SIRO?

MANAGEMENT SOLUTIONS' SIRO PLATFORM OFFERS INTEGRATED OPERATIONAL RISK AND CONTROL MANAGEMENT SOLUTIONS TO FINANCIAL INSTITUTIONS AND LARGE CORPORATIONS



SIRO's modules are designed and integrated to facilitate the advance management of Operational Risk and meet regulatory expectations.

- ▶ **Common data management:** organization, processes, risk categories, business lines, etc.
- ▶ Events database.
- ▶ Risk & Control Self-Assessment (**RCSA**) questionnaires.
- ▶ **Key Risk Indicators** – KRIs.
- ▶ **Action Plans**.
- ▶ Business **continuity**.
- ▶ **Follow-up** on recommendations.
- ▶ Internal model-based **Calculation Engine Module** (for Capital and Insurance Portfolio requirements).
- ▶ **Integrated reporting** dashboards.

Operational Risk self-assessment questionnaire

Risk *Fraud in shops and ATMs: Credit cards and debit cards*

Code	2
Synthetic description of risk	Fraud in shops and ATMs: Credit cards and debit cards
Risk category	Theft and fraud (external)
Business line	Retail Banking
Associated impact type	Financial, Reputational
Description	Risk of fraud in shops (online without authorization, offline, batch, internet platform (actual IP), Fraud realized by the businesses themselves (interbank)).
Detailed description	
User responsible	Anna Hagman
Unit responsible	Payment Operation

Impacts

Financial	Reputational	Other Economic Impacts
Financial losses related with the indemnification due to customer complaints.	Possible impact in reputation with clients.	

Risk Assessment

Total frequency	3/100	Per year	
Loss event frequency	3/100	Per year	
Average impact assessment (€)	100,000 - 5,000,000	Impact (scale)	3
Worst impact assessment (€)	6,000,000 - 24,000,000	Impact (scale)	4

Control effectiveness

Control 1	Control 2		
Code	1		
Name	Compliance points review		
Description	There is an area that receives complaints and compliments with Credit Card Fraud Prevention to review points of complaints.		
Type	Defective		
Mitigation scope	Frequency and Impact		
User responsible	Anna Hagman		
Unit responsible	Payment Operation		
Coverage	100%	Coverage (scale)	10 (scale 1 to 100)
Effectiveness	100%	Effectiveness (scale)	High

Global control effectiveness

Strength	High	Strength (scale)	High
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SOLUTIONS BASED ON QUALITATIVE ASSESSMENTS (E.G. 'RED', 'YELLOW' AND 'GREEN') HAVE DIFFICULTIES TRANSLATING THOSE INTO QUANTITATIVE FIGURES THAT CAN THEN BE INTEGRATED WITH THE FINANCIAL IMPACTS ACCOUNTED FOR THE OPERATIONAL RISK EVENTS THAT HAVE OCCURRED

ADVANTAGES

OPERATIONAL RISK ARCHITECTURES BASED ON INTEGRATING SEPARATE SPECIALIST APPLICATIONS ARE PROBLEMATIC (COHERENCE, INTERFACES, EXTRA COSTS, SUBSTANTIAL EFFORT TO RECONCILE INFORMATION). AN INTEGRATED SOLUTION PROVIDES RISK MANAGERS WITH A GLOBAL PICTURE OF RISK

SIRO's scope has gone beyond Operational Risk management to include internal control, modeling and optimization of the insurance portfolio in large industrial corporations as well as specific management of legal, reputational and outsourcing risks.

Main features:

- ▶ **Experience:** available **since 2004**; mature and advanced tool.
- ▶ Proven tool: has passed **supervisory audit** and validation processes.
- ▶ Credentials: implemented in a large number of Financial Institutions. **Large user base.**
- ▶ **Developments:** methodological and functional updates released on an **annual** basis.
- ▶ Adaptable: a common core supports the most advanced Operational Risk Management methodologies, but is **flexible to adapt** to the individual needs of organizations.
- ▶ **Quantification:** statistical-mathematical engine (**SIRO-ARE**) that incorporates the most advanced techniques in the market, the widest range of distributions for severity fitting (e.g. Generalized Hyperbolic), capacity to work with scenarios, and maximum flexibility afforded by the tool's **R language** interpretation capability.
- ▶ **Sophisticated reporting:** integrates an **OLAP engine, interactive graphics** export to **Excel and PDF**, production of regular reports for management and business areas. Large number of predefined and customized reports.
- ▶ **Other areas:** specific versions for areas outside Operational Risk: such as **Insurable risk** (Insurance policy optimization), **Audit / Internal Control / Compliance and Business Continuity.**

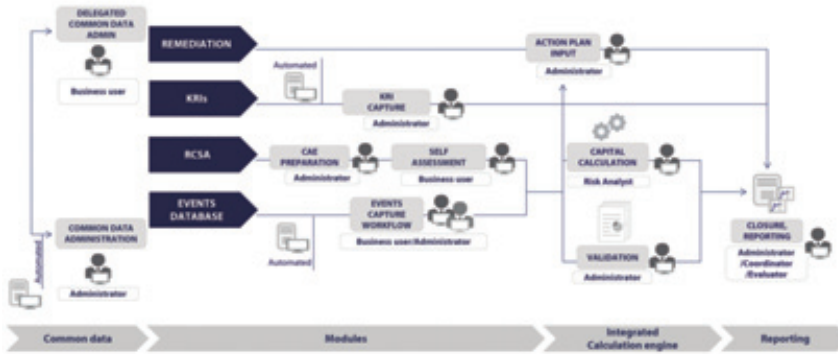
THE TOOL SHOULD ADAPT TO THE MANAGEMENT FRAMEWORK AS OPPOSED TO THE MANAGEMENT FRAMEWORK ADAPTING TO THE TOOL

Event database query. Menu for direct access to the SIRO functionality

The screenshot displays the 'OPERATIONAL RISK' web application interface. On the left is a navigation menu with categories like 'Operational Risk Management Module', 'Users Management', 'Process Management', etc. The main area is titled 'Search Events' and contains search filters for Event Code, Related Process Code, Occurrence Date (From/To), Related Risk Code, Event Status, and Occurrence Date (To). A 'Search' button is located below the filters. Below the search area, a table shows search results for 3 elements found. The table has columns for Actions, Code, Description, Occurrence Date, Status, Related Risk, Total Gross Costs, Total Recoveries, and Total Net Loss.

Actions	Code	Description	Occurrence Date	Status	Related Risk	Total Gross Costs	Total Recoveries	Total Net Loss
	1	Provision charges made on the credit card of a client in debt, amount are reduced.	03/02/2010	Closed	1 - Fraud due to theft / loss of credit card	20 €	0 €	20 €
	2	Security-right transactions with fraudulent person due to substitution and / or magnetic strip cloning on debit cards (Shopping unlinked, it is analyzed and determined that the signature does not match the one of the account's holder).	09/02/2010	Closed	1 - Fraud due to theft / loss of credit card	1.200 €	200 €	1.000 €
	3		11/02/2010	opened	2 - Fraud in shops and ATM's (credit cards and debit cards)	30.000 €	0 €	30.000 €

MODULES



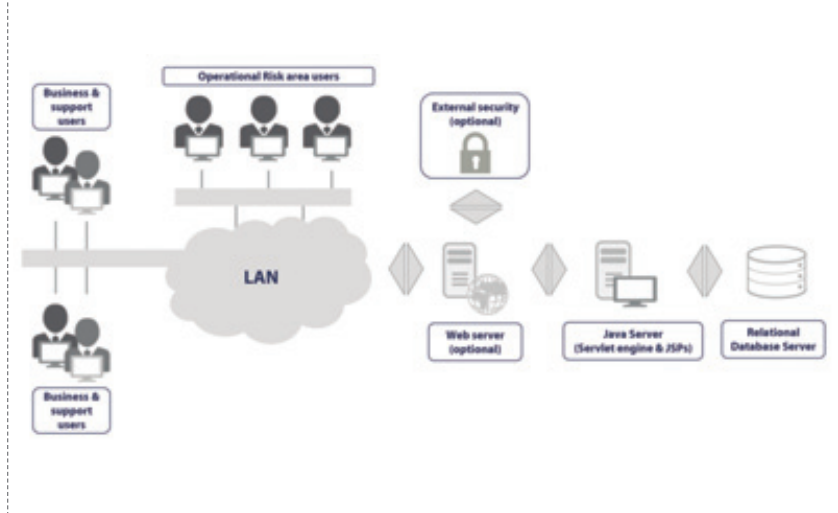
LESS MATURE TOOLS
CAPTURE A SNAPSHOT
PICTURE OF THE RISK MAP,
BUT DO NOT STAND UP
WELL TO ORGANIZATIONAL
AND PROCESS CHANGES
OVER TIME

Common data management module	Risk Control Self Assessment (RCSA)	Operational Risk - Action Plans
<p>Processes, Risks, Controls, Organizational Structure, Users and Roles, Risk Categories, Business Lines...</p> <p>Features Can be integrated into the corporate intranet. Allows automatic data capture from enterprise master data sources. Allows data transfer to external systems. Focus on risk users. Minimum workload. Full traceability of changes. Possibility to attach documents.</p>	<p>Work organization through campaigns. Customizable assessment workflow. Questionnaire generation from templates. Assessment methodology quantifiable in currency units. Assessment auditability. Online VaR calculation through Monte Carlo Dynamic questionnaires. User help. Specific assessments:</p> <ul style="list-style-type: none"> Outsourcing risk Legal risk Reputational risk <p>Independent control assessment.</p>	<p>Direct relationship with risks and controls. Possibility to attach documents to plans. Alert generation. Action plans as a result of high risk assessment scores, input of significant events, outlier indicators or deficient controls. Integration of action plans with audit recommendations.</p>
Operational Risk - Loss Database	SIRO-ARE (Advanced Risk Engine)	Operational Risk - Indicators
<p>Registration of events, their impacts, and direct and indirect recoveries. Capture:</p> <ul style="list-style-type: none"> Individual, screen-based. Massive, screen-based (Excel). Automated capture interface. <p>Capture workflow. N:1 relationship with risks. Possibility to attach documents to events. Multi-impact events. Integration with Action Plans.</p>	<p>Data analysis and cleansing, hypothesis verification and identification and setup of Operational Risk categories. Frequency and severity distribution fitting. Integration of sources:</p> <ul style="list-style-type: none"> Internal loss database. Qualitative data (scenarios). External events. <p>VaR calculation. Back testing. Stress Testing. Sensitivity and stability analysis. Regulatory reporting. Integration with R language.</p>	<p>KRI, KCI and KPI support. Setup of indicators, their interpretation and scales. Capture:</p> <ul style="list-style-type: none"> Individual, screen-based Massive, screen-based (Excel) Automated capture interface <p>N:1 relationship with risks and with risk categories. Single and composite multivariate indicators providing a detailed/aggregated picture. Alert generation. Integration with Action Plans.</p>
Insurable Risk / Insurance Portfolio Optimization	Business continuity/BIA analysis	Cross-functional features
<p>Management and valuation of physical assets. Insurance portfolio management. Loss capture. Frequency and severity distribution modeling. "What-if" analysis. Franchise and reinsured risk optimization. Captive insurer management.</p>	<p>Process criticality rating oriented to establishing Continuity Plans. Discontinuity impact assessment:</p> <ul style="list-style-type: none"> Financial Regulators Reputational Other areas Clients <p>Continuity Plan testing management.</p>	<p>Integrated OLAP engine. Integrated statistical calculation engine. Interactive graphics. Regular, integrated reports. Document management on the system's database. Workflow engine backed by database. Profiling and authentication can be delegated. Online historical and current data query. Traceability and auditability of changes.</p>

TECHNICAL ARCHITECTURE

SIRO IS OFFERED IN TWO FORMS: SOFTWARE AS A SERVICE (SAAS), GUARANTEEING MAXIMUM SECURITY AND SERVICE LEVELS, AND ON-PREMISES, WITH A CUSTOMIZABLE ARCHITECTURE DESIGNED TO ADAPT TO THE ORGANIZATION'S SPECIFIC TECHNOLOGY

SIRO architecture



Three-layer architecture

- ▶ A Java server that implements a servlet container and a Java Server Pages (JSP) engine, of which there are versions for almost all current Operating Systems: WebSphere, Tomcat, WebLogic, etc.
- ▶ A Relational Database Management System (RDBMS): Oracle, SQL Server, etc.
- ▶ A web server (optional), usually part of the intranet infrastructure, where user authentication is delegated.
- ▶ Client: user PC with a web browser.

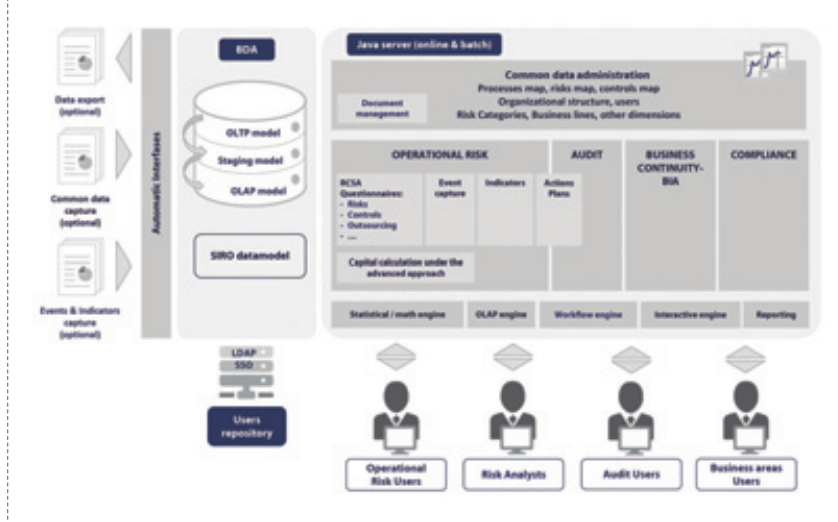
Service modes

- ▶ Software as a Service.
- ▶ On premises.

Technical features

- ▶ Developed independently of the operating system, Java Application Server and Relational Database Management System used.
- ▶ Security can be delegated to the existing corporate Single Sign On/Intranet architecture.
- ▶ Protection of URLs and against malicious access.
- ▶ Corrective maintenance and support with flexible Service Levels tailored to each individual organization.
- ▶ Yearly version updates under the maintenance contract.

Technical features



CREDENTIALS

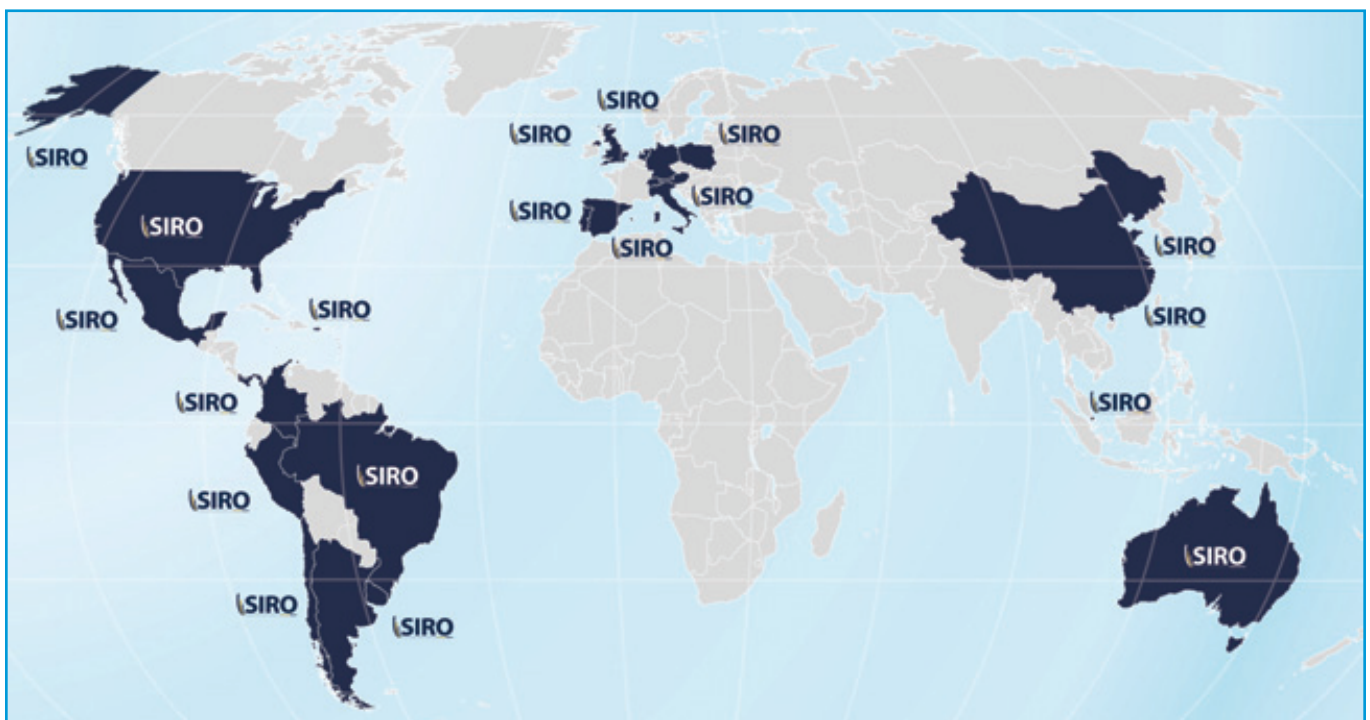


OPERATIONAL RISK UNITS HAVE VERY LIMITED HUMAN RESOURCES THAT CANNOT BECOME SLAVES TO ROUTINE. TOOLS SHOULD BE SUFFICIENTLY MATURE AND OPTIMIZED SO AS TO REDUCE THEIR WORKLOAD AND ALLOW THEM TO FOCUS ON HIGHER VALUE-ADDED TASKS

Main SIRO implementations

The different SIRO modules are widely implemented in organizations of various kinds and endorsed by Regulatory Authorities. Among the types of organizations in which SIRO is implemented are:

- ▶ Central Banks, as well as regulatory and supervisory bodies.
- ▶ Large, highly diversified financial groups with a presence in different geographical regions.
- ▶ Financial institutions with an international presence.
- ▶ Financial institutions with a local presence.
- ▶ Insurance companies.
- ▶ Corporations in industry sectors (Insurable risk module/Insurance portfolio optimization).



MANAGEMENT SOLUTIONS

LEADING BUSINESS CONSULTING SERVICES FIRM

Management Solutions is an international consulting Firm whose core mission is to deliver business, risk, financial, organization and process-related advisory services, targeted at both functional aspects and the implementation of related technologies.

Management Solutions currently has a multidisciplinary team (functional, mathematical, technical and systems integration) of nearly **2,000 professionals**, and operates through 23 offices (11 in Europe, 11 in the Americas and 1 in Asia) from where we serve customers operating in over 40 countries in **Europe, the Americas, Asia** and **Africa** (Senegal, Equatorial Guinea, etc.).

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Management Solutions' differentiating factor lies in its in-depth knowledge of the businesses in which its clients operate and in its high degree of sector-specific and functional specialization.

To ensure full coverage of its clients' needs, Management Solutions structures its value proposition by industry and line of activity, bringing together a wide range of skills.

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(Banking and Insurance)*

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Government

Construction

Services

Strategy

Sales and Marketing Management

Transformation: Organization and Processes

Risk Management and Control

Management and Financial Information

New Technologies

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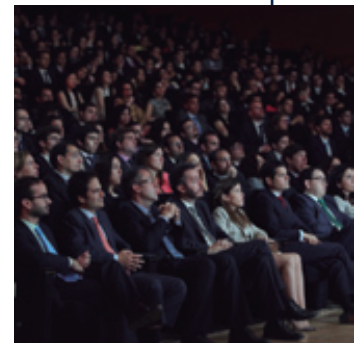
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