

Risks Integrated Management Tool



WHY MIR

MIR IS MANAGEMENT SOLUTION'S ANSWER TO INTEGRATED RISK MANAGEMENT, UNIFYING THE REGULATORY AND MANAGEMENT VIEWS UNDER THE SAME CUSTOMIZABLE AND MODULAR PLATFORM

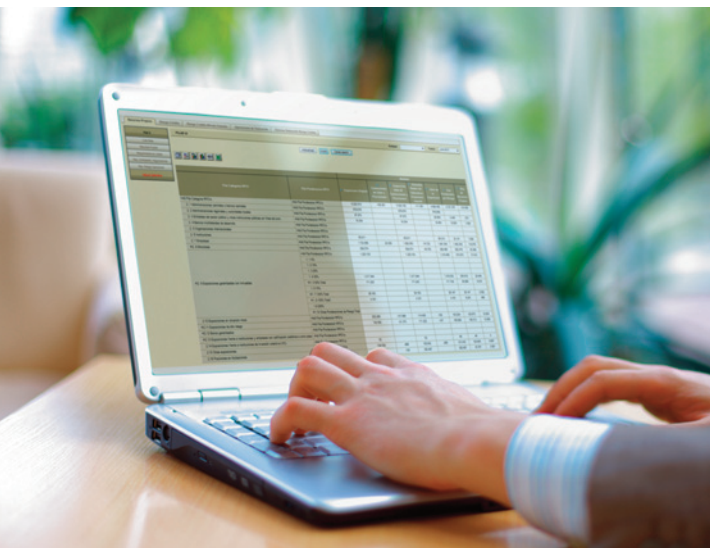
MIR offers a global solution both from the regulatory and the risk management point of view, maximizing the consistency and exploitation of the risk information obtained by every area of an Entity:

- ▶ Incremental implementation methodology tailored to the priorities of each individual Entity.
- ▶ Multidimensional data model geared towards the exploitation (reporting) and functionality of accounting reconciliation.
- ▶ Uniqueness of information and calculation logic ensures consistency between the different reports generated.
- ▶ Solution adapted to best risk management practice and the specific regulatory requirements of European and American supervisory authorities (particularly Basel 3 for Capital and IFRS 9 for provisions).

MAIN IMPLEMENTATIONS

REDUCED IMPLEMENTATION TIMELINES AND SUPPORT BOTH FROM A TECHNICAL AND FROM A BUSINESS POINT OF VIEW ARE TWO FEATURES HIGHLY VALUED BY OUR CLIENTS

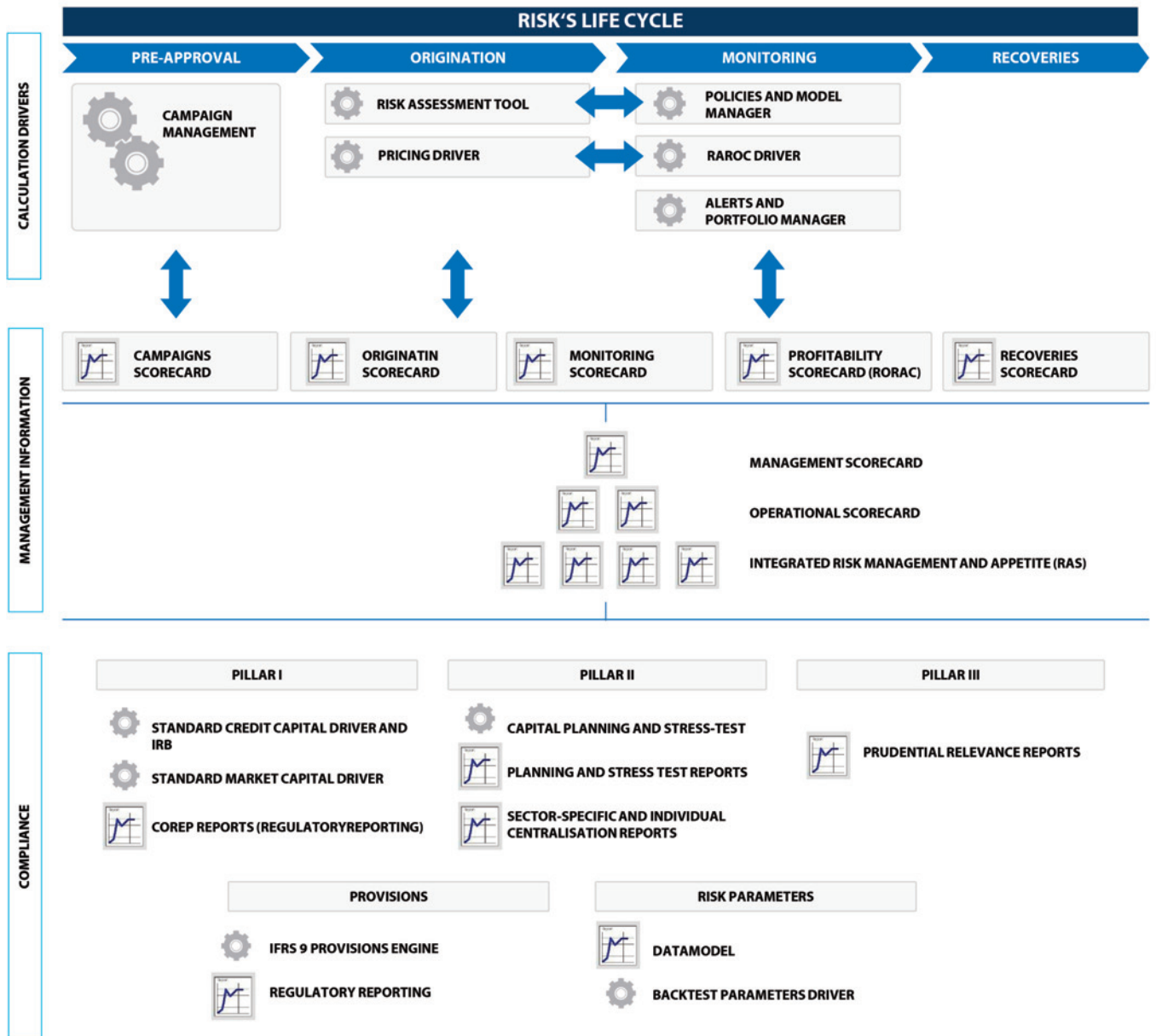
The different modules in our MIR solution are implemented across some 100 financial institutions in Spain and Latin American countries, including:



- ▶ Strongly diversified International Financial Groups with a presence in different geographies.
- ▶ Local Entities of different sizes.
- ▶ Multinational Financial Organisations, Development Banks and Microfinance Institutions.
- ▶ Investment Services Companies and Securities Firms.

FUNCTIONALITIES

MIR'S MODULAR STRUCTURE ALLOWS FOR INCREMENTAL AND CUSTOMIZABLE IMPLEMENTATION TO SUIT THE NEEDS OF EACH CLIENT



FUNCTIONALITIES

POLICIES AND MODEL MANAGER – RISK ASSESSMENT TOOL

The policies and model manager is an analytical environment focused on covering every inch of the risk decision model's life cycle, allowing the analysis of automated strategies (score + rules) and of the impact of manual decisions (allocation of responsibilities).

Automated production through the Risk Assessment Tool reduces the time to market of new strategies:

- ▶ Rating models monitoring: predictive capacity, portfolio stability, sub-populations analysis...
- ▶ Approach focused on metadata (adapted to each Entity's data model, which helps and speeds up implementation).
- ▶ Policy on Delegated Authority.
- ▶ Champion/Challenger strategies.
- ▶ Cut-off points, profitability and manual decisions analysis.

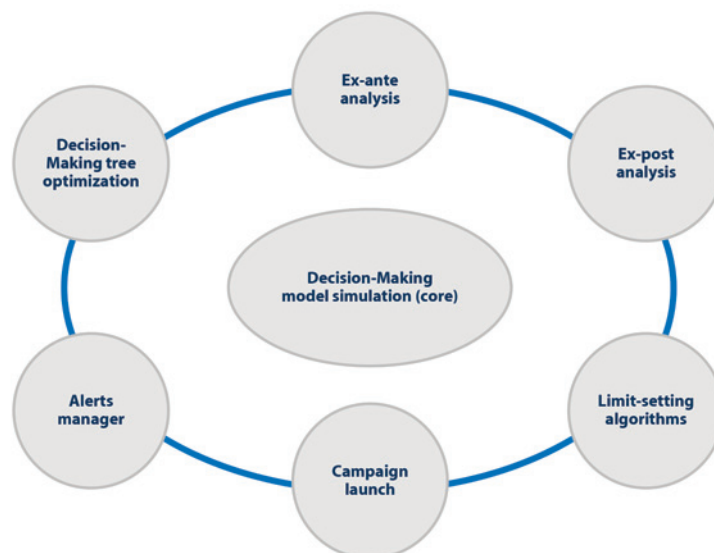
CAMPAIGN MANAGER

Campaign manager enables the assessment of a target population by integrating risk models and policies in order to obtain a limit structure that will allow launching the campaign to clients and non-clients:

- ▶ Automated environment to reduce cost and time.
- ▶ Parametrical and user-friendly environment.

THE MIR TOOL EMPOWERS A COMPLETE AND INTEGRATED VIEW OF THE RISK FUNCTION'S LIFE CYCLE: CAMPAIGN DEFINITION AND LAUNCH, RISK ORIGINATION PROCESS, ANALYSIS AND OPTIMIZATION, AND OPTIMIZATION AND PORTFOLIO MONITORING THROUGH ALERTS

Comprehensive and integrated view of risk decision-making



FUNCTIONALITIES

ALERTS AND PORTFOLIO MANAGER

The alerts manager allows you to define and monitor different level alerts (portfolio, customer, product ...) for key risk indicators (volume, late payments, expected loss, capital, RAROC ...) incorporated into the system's different reporting modules, including Risk Monitoring and integrated Risk Management and Appetite (RAS) modules.

Likewise, the portfolio manager enables proactive customer management through business strategies and impairment control, prioritizing recovery measures and automatically identifying other pending actions with immediate feedback to Corporate Services.

RISK PARAMETERS

The MIR data model contains all attributes necessary to estimate risk parameters (PD, LGD, CCF), enabling its exploitation using data mining tools. MIR also:

- ▶ Implements a risk parameters back test and stress test.
- ▶ Includes the necessary incremental information for other system functionalities, which generates synergies related to ETL re-use, audit processes, etc.

The screenshot shows a software interface with a sidebar on the left containing navigation options: 'Parameters allocation', 'parameters mapping', 'Parameterization of PD's', 'Prepaid curve', and 'Allocation rates definition'. The main area displays a table titled 'Home / Provisions calculation / Parameterization of PD's'. The table has columns for 'Curve/Year' and 'Year:0' through 'Year:9'. The rows represent different mortgage models with various criteria like 'Cure period', 'ToB <= 13 - Past Due 90', 'ToB <= 13 - Past Due 60', etc. The table contains numerical values for each parameter across the years.

Curve/Year	Year:0	Year:1	Year:2	Year:3	Year:4	Year:5	Year:6	Year:7	Year:8	Year:9
Cure period	0,344289	0,098233	0,063429	0,039007	0,016067	0,018935	0,005527	0,004242	0,003266	0,002499
ToB <= 13 - Past Due 90	0,184635	0,169269	0,059708	0,043862	0,03039	0,017457	0,019507	0,014574	0,010988	0,008274
ToB <= 13 - Past Due 60	0,582814	0,185201	0,050727	0,021805	0,013483	0,012243	0,04352	0,025364	0,015882	0,010384
ToB <= 13 - Past Due 90	0,876823	0,038568	0,00327	0,003666	0	0	0	0	0	0
ToB <= 13 - 10 > TIM <= 15	0,007762	0,021336	0,023010	0,016923	0,020049	0,015341	0,010365	0,007960	0,006141	0,004704
ToD <= 13 - TIM <= 10	0,007503	0,014124	0,007971	0,013068	0,01328	0,007186	0,004235	0,003279	0,002542	0,001955
ToB <= 13 - TIM > 15	0,014785	0,035672	0,034422	0,022641	0,01896	0,016729	0,014392	0,011006	0,008448	0,006451
ToB > 13 - LTV <= 80% - 10 < TIM <= 15	0,006681	0,021095	0,021077	0,019427	0,015307	0,011878	0,009179	0,007067	0,005453	0,004181
ToB > 13 - LTV <= 80% - Past due 30	0,067194	0,071875	0,0618	0,042782	0,033174	0,025847	0,018266	0,013834	0,010541	0,008003
ToB > 13 - LTV <= 80% - Past due 60	0,290079	0,140823	0,073682	0,030828	0,029531	0,025506	0,050075	0,034038	0,023079	0,017016
ToD > 13 - LTV <= 80% - Past due 90	0,570075	0,122356	0,060040	0,030060	0,030586	0,01881	0,025757	0,016574	0,011150	0,007709
ToB > 13 - LTV <= 80% - TIM <= 10	0,005378	0,010306	0,010634	0,008184	0,005513	0,004003	0,003351	0,002507	0,002015	0,001551
ToB > 13 - LTV <= 80% - TIM > 15	0,007102	0,020336	0,019576	0,022864	0,021121	0,019158	0,019212	0,01462	0,01118	0,008512
ToB > 13 - LTV > 80% - 10 < TIM <= 15	0,007312	0,013309	0,016005	0,012979	0,011025	0,008913	0,008889	0,006848	0,005287	0,004055
ToB > 13 - LTV > 80% - Past due 30	0,080883	0,061908	0,048314	0,038861	0,020851	0,018348	0,019137	0,014478	0,011021	0,008362
ToB > 13 - LTV > 80% - TIM <= 10	0,004752	0,005203	0,006902	0,00541	0,005027	0,003313	0,003507	0,00278	0,002156	0,001659
ToD > 13 - LTV > 80% - TIM > 15	0,01272	0,024026	0,017509	0,012169	0,01126	0,01243	0,019	0,014469	0,011071	0,008432
ToB > 13 - LTV > 80% - Past due 60	0,386905	0,127665	0,078031	0,040537	0,021907	0,038479	0,018711	0,013862	0,01012	0,007517
ToB > 13 - LTV > 80% - Past due 90	0,695198	0,123704	0,022885	0,015318	0,015349	0,00503	0	0	0	0

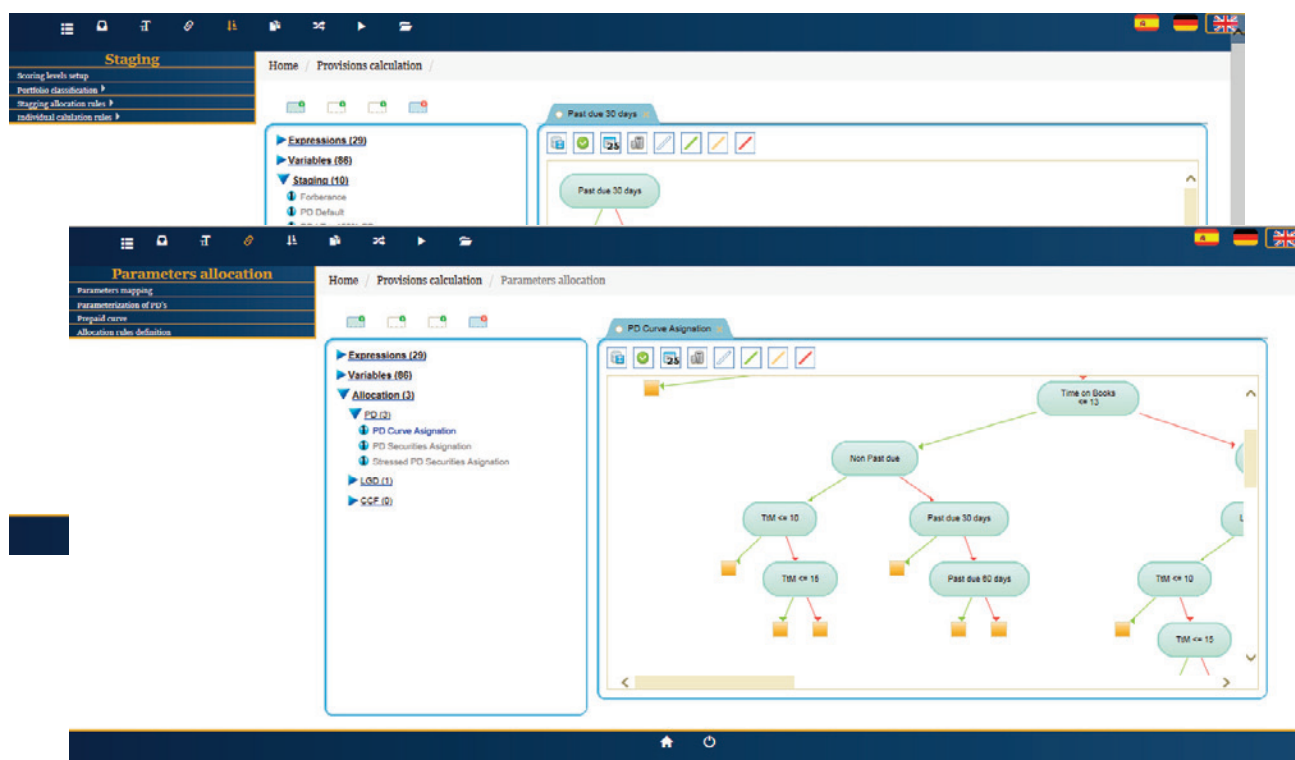
FUNCTIONALITIES

REGULATORY COMPLIANCE

MIR covers the needs relating to provisions and capital calculation and regulatory reporting (Basel Pillars I, II and III) and provisions according to IFRS 9 standards and country-specific regulatory requirements. Using this platform supports the consistency of the information generated as well as the emergence of synergies among the different areas involved:

- ▶ Adapts to each country's legislation.
- ▶ Supports Standard and IRB capital calculation in Credit Risk and Standard capital calculation in Market Risk.
- ▶ Supports the calculation of provisions through practical expedients and internal models in line with IFRS 9 regulations and country-specific regulatory requirements.
- ▶ Audits at the lowest granularity level.
- ▶ Reconciliation with accounting through specific reports.
- ▶ Capital and provisions simulation and stress testing capabilities to meet the ICAAP capital requirements and IFRS 9 provisions requirements.

DRIVEN BY THE BASEL III AND IFRS 9 REGULATORY FRAMEWORK, THE ENTITIES ARE UNDERTAKING SIGNIFICANT IMPROVEMENTS TO THE INTEGRATION OF RISK MANAGEMENT MODELS, WHICH ENTAILS A REVIEW OF ORGANIZATIONAL ASPECTS, PROCESSES, SYSTEMS AND TOOLS



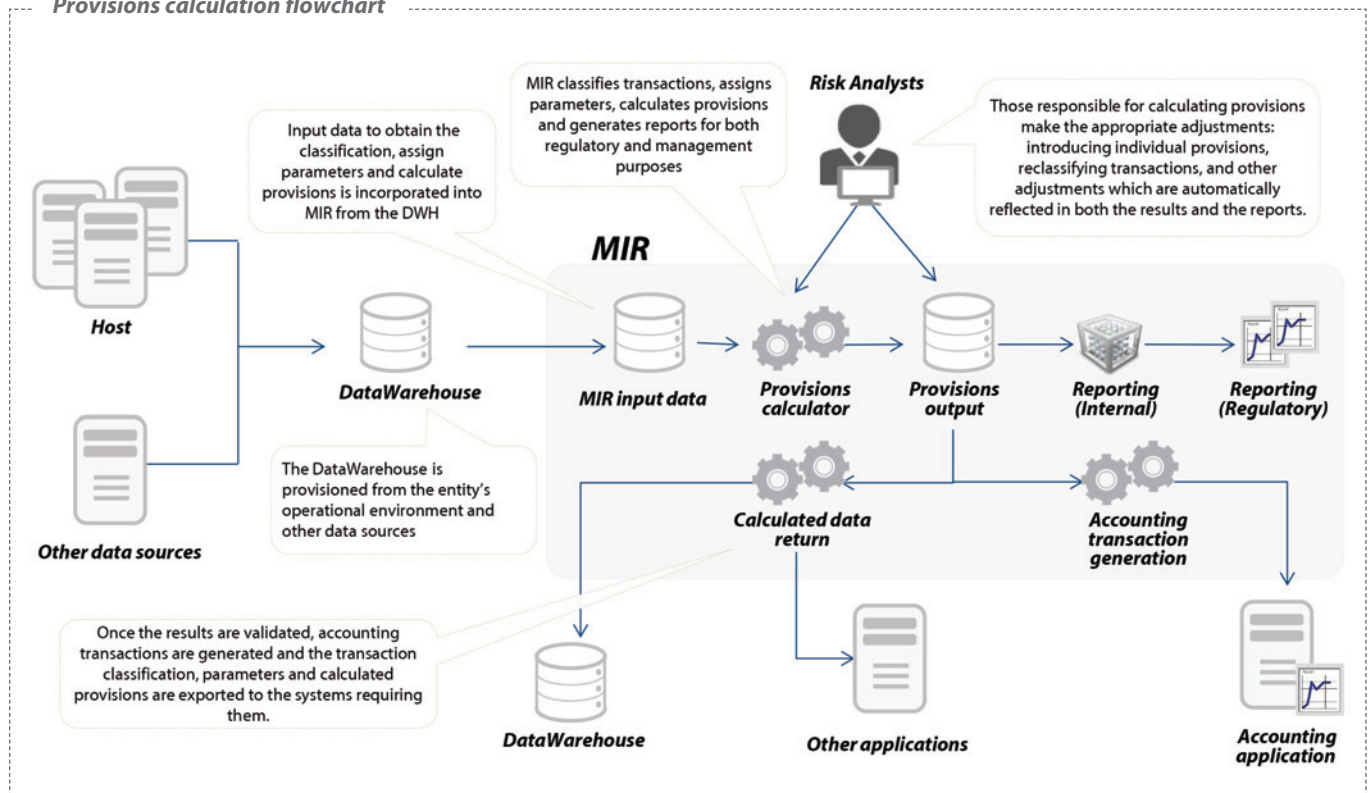
FUNCTIONALITIES

IFRS 9 COMPLIANCE

MIR provides an integrated IFRS 9 compliance solution enabling:

- ▶ Transaction sorting and parameter allocation:
 - Parameterization and execution of indication models for classification in stages (model manager).
 - Treatment of refinancings.
 - Segmentation for individual analysis.
 - Parameter assignment.
- ▶ Calculation of impairment loss allowances:
 - Treatment of collateral (haircuts).
 - Calculation of generic provisions: internal models and practical solutions.
 - Calculation of provisions through individual assessment.
- ▶ Reports and scenarios:
 - Automated generation of the new reports on provisions (for regulatory and management purposes).
 - Forward looking scenario simulation and impact analysis.
- ▶ Accounting integration:
 - Accounting interface generation.

Provisions calculation flowchart

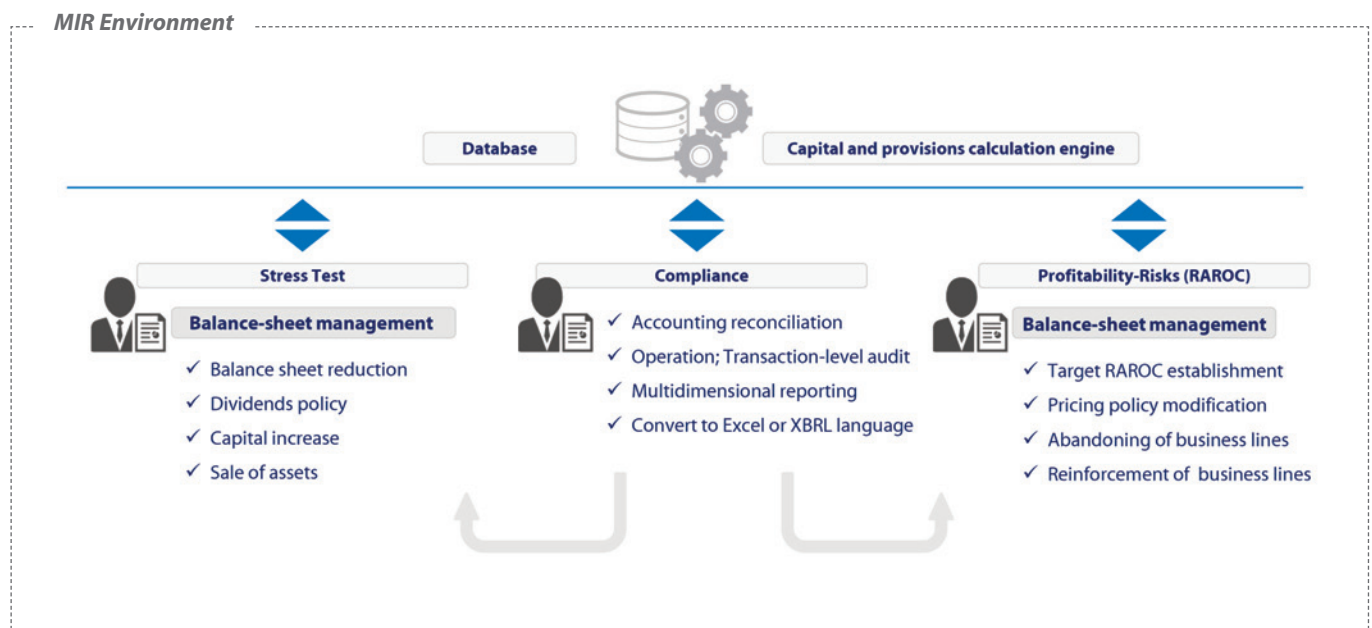


FUNCTIONALITIES

RAROC AND PRICING

The RAROC functionality allows entities to measure different risk-adjusted profitability levels (historic and forward-looking) through the PRICING driver, adjusting pricing policies to align them with their target profitability levels:

- ▶ Bottom-up approach.
- ▶ Analysis performed over different aggregation levels: contract, customer, bureau, portfolio, etc.
- ▶ Possibility of using regulatory or management parameters
- ▶ Integrated with the regulatory calculation drivers



STRESS TEST AND CAPITAL AND PROVISIONS PLANNING

MIR allows you to create capital planning and provisions stress scenarios. This makes it possible to manage internal and regulatory solvency targets and provision levels for both base and stress scenarios.

- ▶ Top-down simulation of standard portfolio and bottom-up simulation of IRP portfolios.
- ▶ Interface designed to provide an intuitive way of creating new scenarios.
- ▶ Delinquency entries, provision needs and evolution of results estimation.

FUNCIONALITIES

SCORECARD

MIR includes a complete and customizable risk scorecard which, via an OLAP driver, enables analysis at different aggregation levels as well as the creation of multidimensional reports.

Integrated Risk Management and Appetite (RAS)

- ▶ Summarized information.
- ▶ Information focused on decision making.
- ▶ Ease of analysis.

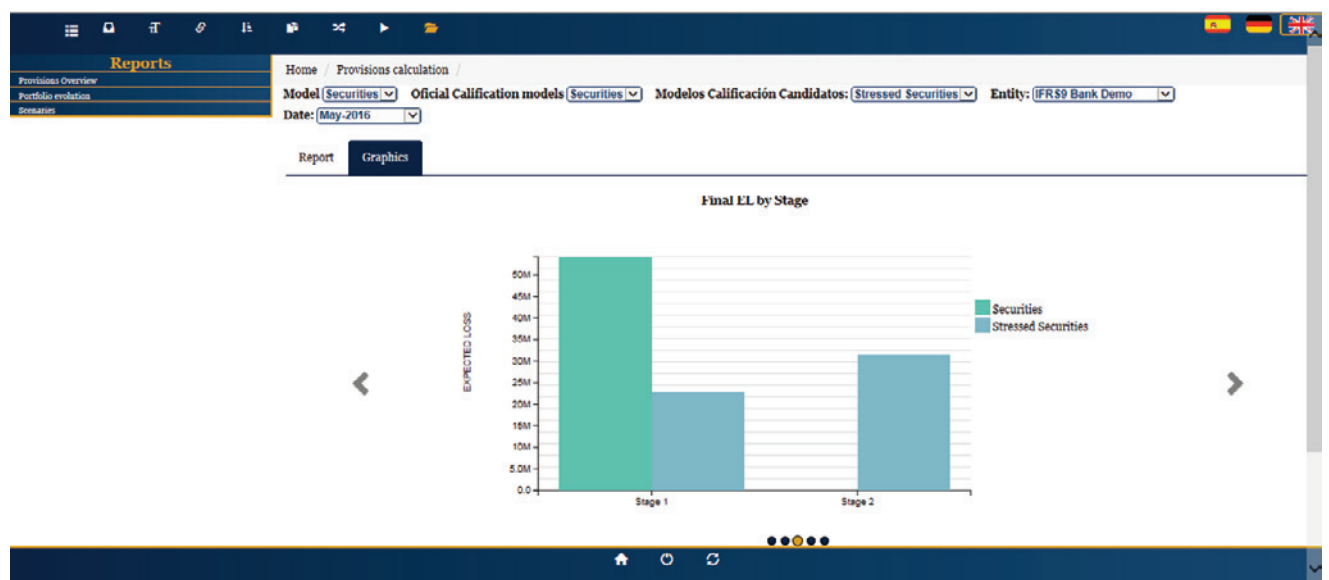
Operational

- ▶ Detailed information.
- ▶ Information focused on the diagnosis.
- ▶ Multidimensional Analysis.

Processes

- ▶ Origination reports: processing times
- ▶ Monitoring reports: alerts, delinquency, etc.
- ▶ Recoveries reports: managed portfolio, full cycle view, etc.

WORKING WITH AN INTEGRATED RISK PLATFORM LIKE MIR GENERATES MANY SYNERGIES IN IMPLEMENTATION AND ALSO IN THE DAY-TO-DAY ACTIVITIES OF RISK MANAGERS, ENSURING CONSISTENT RESULTS.



TECHNICAL ARCHITECTURE

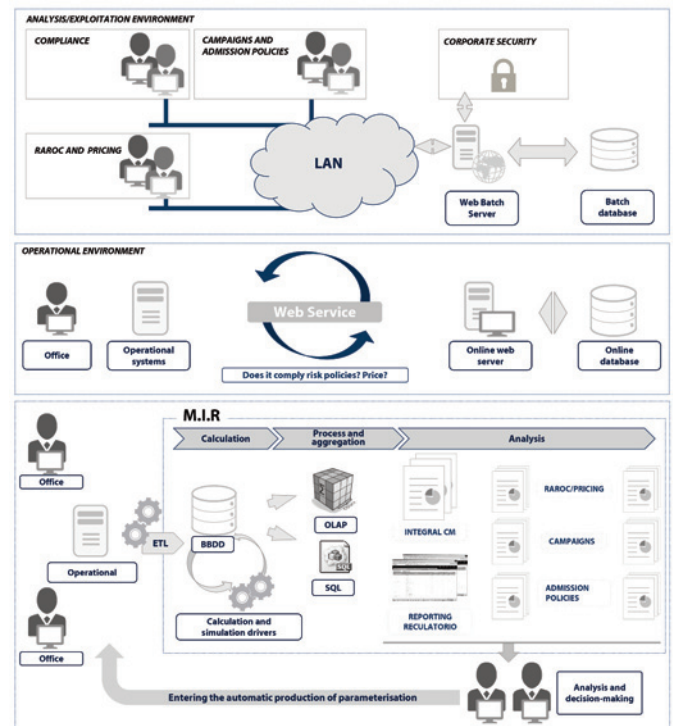
THE MIR ARCHITECTURE ONLY USES STANDARD MARKET TECHNOLOGY IN ORDER TO REDUCE TECHNOLOGY COSTS

OPERATIONAL AND ANALITICAL ENVIRONMENT

- ▶ MIR provides to the different areas of the firm with an analysis and simulation environment, being able to nimbly produce new strategies.
- ▶ Bringing these strategies into production is done automatically through batch processes, which replicate the parameterizations established by the user.

THREE LAYERS ARCHITECTURE

- ▶ The user's PC with a web navigator (that will act as the client).
- ▶ A Java applications web server for which different versions exist in nearly every OS.
- ▶ A Relational Database Manager System.



BENEFITS

IN A CHANGING AND COMPETITIVE ENVIRONMENT LIKE THE CURRENT ONE, AN ADAPTABLE INTEGRATED RISK SOLUTION BECOMES NECESSARY, ENABLING A NIMBLE DECISION MAKING PROCESS AND REDUCING THE TIMINGS OF PUTTING INTO PRODUCTION NEW STRATEGIES

MAIN CHARACTERISTICS:

- ▶ Incremental implementation and tool adapted to the needs and possibilities of each client.
- ▶ Maintenance service of the tool which encompasses a personalized attention according to the needs of the client:
 - Contrasted tool, used for regulatory and management reporting by a large number of entities, overcoming throughout these years various internal and external audit processes.
 - Continual evolution, through annual releases with regulatory updates and technical improvements.
 - High level of parameterization and customization, with the possibility of adding new reports or functionalities.
- ▶ Adaptable, developed using standard market technology and with a multiplatform focus.
- ▶ Integrated reporting, including interactive graphs and an OLAP driver, to enable the exploitation of multidimensional reports.

MANAGEMENT SOLUTIONS LEADING BUSINESS CONSULTING 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 **2,200 professionals**, and operates through **27 offices** (13 in Europe, 13 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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Asia	Beijing

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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Telecommunications

Consumer and Industry

Government

Construction

Services

Strategy

Sales and Marketing Management

Transformation: Organization and Processes

Risk Management and Control

Management and Financial Information

New Technologies



We create value propositions for our clients and commit to their effective implementation to exceed client expectations, becoming their trusted partners

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