

# FINsights

Technology Insights for the Financial Services Industry

Governance, Risk and Compliance »



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## From the Editors Desk

We are delighted to present the second issue of the Infosys Banking and Capital Markets journal FINsights. The spotlight in this issue is on Governance, Risk and Compliance and the compilation of articles reflect perspectives on risk and its measurement, governance, the compliance conundrum and our take on the priorities in risk and compliance and their technology implications in the coming years.

The increased incidence of failures in the financial services marketplace over the past decade has given visibility to the science (and art) of understanding and measuring risk in running a business, making strategic and tactical decisions and participating in markets and economies that are increasingly linked in a flattening world. A recent such event, covered in one of the articles, has been the sub-prime crisis and the unforeseen ripple effects in markets in distant parts of the world.

As always we have tried to reflect in these articles the unique value that Infosys brings to its clients through a combination of deep domain understanding, technology best practices and global sourcing expertise. The article on sub-prime crisis reflects the current challenges in credit risk measurement and brings a perspective that combines credit risk measurement approaches with a global knowledge process outsourcing (KPO) option.

Risk and compliance is a multi faceted animal and the focus in the past few years has been on giving it a holistic view through a unified Governance, Risk and Compliance (GRC) program. The articles featured on GRC explore integrated controls to implement GRC, use of SaaS in GRC and industry perspectives on GRC and the road ahead. In the area of compliance, the articles look at addressing compliance challenges, an aspect of internal compliance namely employee surveillance and the partial compliance challenge in the wealth management industry. Our articles on risk address credit risk management, the role of master data in risk measurement and risk reporting. Included in this issue is also a case study highlighting the importance of Information Risk Management (IRM).

We would like to thank all the authors from Infosys as well as external contributors - Adam D. Honoré from Aite Group, Tim Leech from Navigant Consulting and Bob Skea of Northstar Systems. As always, we look forward to your queries or comments on Governance, Risk and Compliance or any feedback and suggestions in making FINsights a more relevant and topical journal.

Happy reading and all the best for the new year 2008!

**Balaji Yellavalli and Sudhir Singh**  
*Editors*

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# FINsights

Technology Insights for the Financial Services Industry



## Credit risk management: back to basics

Credit Risk Management has always been on the radar of the top management of any company, but at no other time has its relevance been more felt by financial institutions than in the current business scenario – plagued by increasing competition; and that great nemesis – the sub prime lending crisis. In this age of advancing and complex risk transfer mechanisms, it may make sense to step back and take a look into the very basics of credit risk management. By understanding the overall lifecycle of a typical Credit risk management process, we can identify the key priority areas and challenges in the credit risk arena and how a solution can be designed to tackle this.

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## Overall Life Cycle of Credit Risk Management Process

Credit risk is the largest and most elementary risk faced by banks. It essentially focuses on determining likelihood of default or credit deterioration and how costly it will turn out to be if it does occur. And this is true for consumer lending (retail) or corporate lending (commercial) as well as counterparty credit risk in capital markets.

Although dependent on organizations requirements and profile, a credit risk management lifecycle typically involves the following processes as illustrated in Fig 1

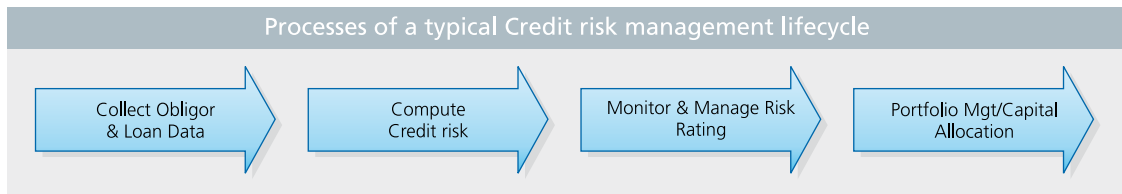


Fig 1: Processes of a typical Credit risk management lifecycle

### Collect Obligor and Loan data

The very foundation of a sound credit risk management system lies in the data that it gets. The inputs needed in this stage are the obligor (borrower), Facility (Loan) and external (ratings) data. This is first critical step in any loan process and all necessary data about the obligor needs to be collected. Fig 2. highlights the key tasks and challenges involved in this step.

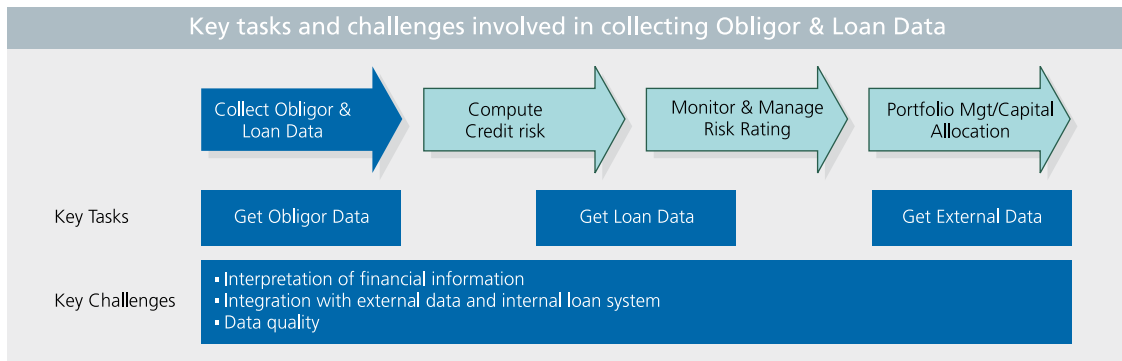


Fig 2: Key tasks and challenges involved in collecting obligor & Loan Data

The key steps here include

**Get the Obligor Data:** The crucial task here is to get the financial, demographic and qualitative data related to the obligor. A majority of the data comes from the financial statements but other sources also exist for example past repayment performances.

**Get the Loan Data:** Next on, the system must be adequately designed to capture Loan data related to the type of loan, amount, maturity etc accurately. Of particular concern here is data related to collaterals, guarantees and contract terms on netting and liquidation. These must be accurately captured in the system as they are crucial in the rating process.

**Get External Ratings Data:** The system must be capable enough to pull relevant data from external systems such as data from rating agencies and also information such as loan data from internal systems.

### Key Challenges

**Interpretation of Financial Information:** How the system interprets the financial information is of prime importance. It must be flexible and robust enough to identify and interpret a variety of information especially financial information.

**System Integration:** The main challenge lies in integrating a variety of systems with the Credit Risk Management

System to ensure that data is pulled out efficiently and effectively. Efficiently in the sense that data retrieval is quick and effective so that the data obtained is accurate, relevant and up to-date.

**Data Quality:** The very foundation of any credit risk management system is the quality of the data that is fed into it. The data that goes in determines the probabilities, exposures, losses etc of an entity and it can be well imagined if the data itself is of poor quality, the output will not be reliable.

## Compute Credit Risk

The next and one of the most crucial phases is calculating the credit risk in the form of risk ratings to meaningfully differentiate risk among different firms or exposures. Fig 3 shows a typical credit risk calculation scenario.

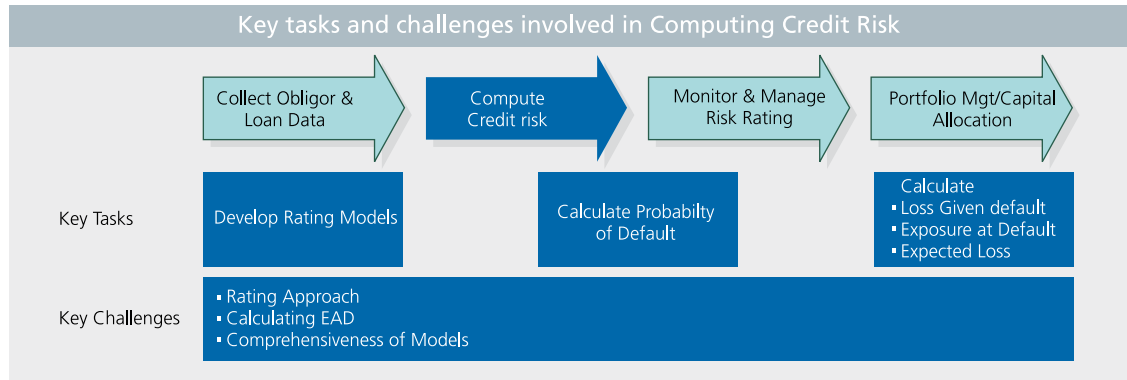


Fig 3: Key tasks and challenges involved in Computing Credit Risk

### Key Tasks

The basic approach involves combining internal rating models (point of time) with external risk information (through the cycle). The basic tasks involved in the rating process of a Commercial obligor are highlighted as follows:

**Develop Rating Model:** The obligor has to be rated using an appropriate model for example there are different models for a Commercial & Industrial category obligor and a Commercial Real Estate category obligor.

**Calculate Probability of Default (PD):** The Probability of Default is the likelihood that a loan will not be repayed and fall into default. The credit history of the counterparty and nature of the investment will all be taken into account to calculate the PD figures.

The following steps will commonly be used

- Analyze the credit risk aspects of the counterparty; This will involve not only the quantitative aspects of the obligor based on his/her financial statements but also qualitative factors related to contingencies, management quality and other factors which are yet to be reflected.
- Map the counterparty to an internal risk grade which has an associated PD.

**Calculate Loss Given Default (LGD), Exposure At Default (EAD) & Expected Loss (EL)**

The Credit Risk Solution also needs to calculate

- Loss Given Default – It is the magnitude of likely loss on the exposure in the event of default. Both quantitative and qualitative factors are used

to calculate Facility LGD which may include Government guarantees, Collateral Support, Guarantor Support etc.

- Exposure At Default - It is defined as the exposure to the borrower at any point of time.

- Expected Loss – It is calculated using the PD, LGD and EAD together. It is the probability weighted loss which is also used for pricing.

### Key Challenges

#### Rating Approach

There are different approaches that a bank may adopt according to the Basel Accord.

- The standardized approach establishes fixed risk weights corresponding to each supervisory category and makes use of external credit assessments to enhance risk sensitivity
- The two approaches (Foundation and Advanced) use Internal Ratings for Regulatory calculations.

The Internal Ratings Based (IRB) approaches offer many more advantages over the standardized approach with specifically the Advanced IRB approach enabling the banks to free up more capital. But the internal ratings based approach requires a host of approvals from the supervisory organizations.

#### Comprehensiveness of Data

The success of adopting the advanced approach relies heavily on availability of adequate data history for modeling, back testing and for regulatory approval.

**Comprehensiveness of Models:** The different obligor risk models should be comprehensive enough to include factors which are most significant in determining credit quality. It has to be comprehensive both in terms of quantitative and qualitative factors.

Fig 4 shows a sample of quantitative and qualitative factors in a typical risk grading model for a commercial obligor.

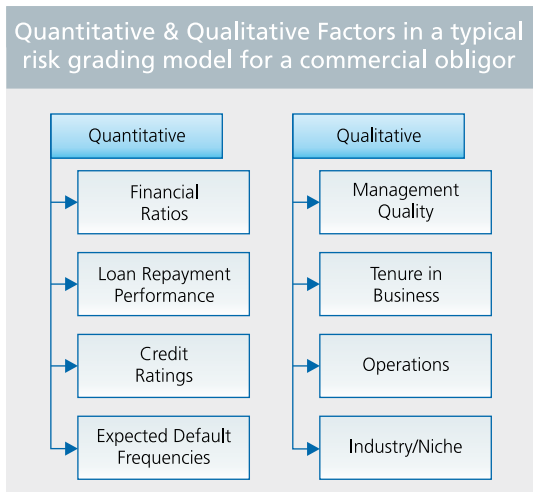


Fig 4: Quantitative & Qualitative Factors in a typical risk grading model for a commercial obligor

## Monitor and Manage Risk Rating

The job is not over with the credit risk rating process. In fact, it is quintessential to monitor and manage the risk ratings as highlighted below in Fig 5

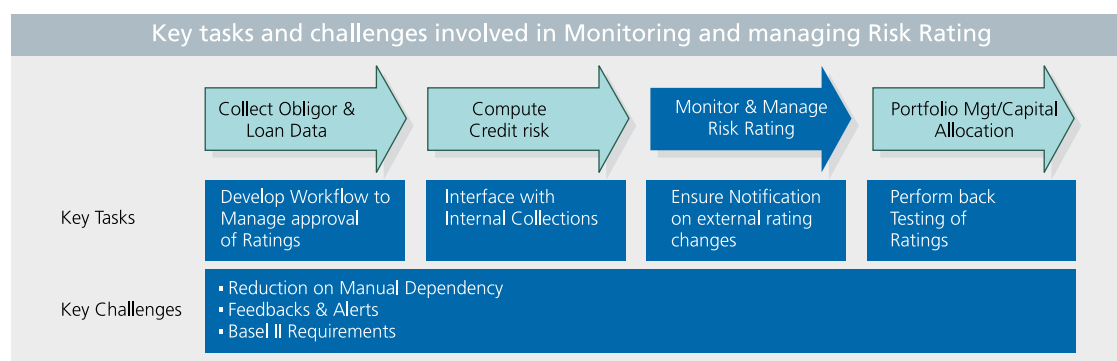


Fig 5: Key tasks and challenges involved in Monitoring and managing Risk Rating

## Key Tasks

**Develop Workflow to manage approval of Ratings:** The Credit Risk Solution should ensure that the risk ratings and exceptions go through proper approvals by appropriate authorities as laid down by guidelines such as the Bank's credit policy. The workflow should also accord traceability to ratings, changes and approvals.

**Ensure notification on external rating changes:** The system should ensure that external ratings changes or other material changes are reflected as early and accurately as possible in the credit risk ratings of an obligor. The system should ensure ratings are reviewed periodically and also based on criteria such as likelihood of credit changes.

**Interface with Internal Collections:** Adequate interface with internal collections is needed so that the system is updated consistently with any default information.

**Perform Back Testing of Ratings:** The system should provide for back testing and calibrating credit risk models within Basel-II guidelines.

## Key Challenges

**Reduction on Manual Dependency:** The main challenge in this stage and it may apply to the whole system as well, is to reduce manual dependency. Especially the entire process of approvals must be made as automatic as possible.

**Feedback & Alerts:** The system must be capable enough to provide for feedback by different players in the system. Also needed is an automatic generation of alerts whenever there is a fundamental change in any of the inputs into the process of Credit rating of a particular entity.

**Basel II requirements:** The crucial factor to be kept in mind is compliance with the Basel II requirements

especially in the areas of credit rating and testing. The system should be capable and flexible enough to allow for changes in the requirements spectrum.

**Manage portfolio and allocate capital:** Portfolio Management has become one of the most difficult challenges in the financial world especially from the point of view of credit risk management. Efficient portfolio management and capital allocation is a process which an organization must put on the top of its agenda. Illustrated below in Fig 6 are the steps in this process

## Key Tasks

**Compute and monitor Portfolio risk:** The System must be capable of computing and monitoring the credit risk at a portfolio level and also enable drill down based upon criteria such as different lines of businesses etc. The system should provide interface with a risk engine to calculate regulatory and economic capital, allocate capital and calculate RAROC

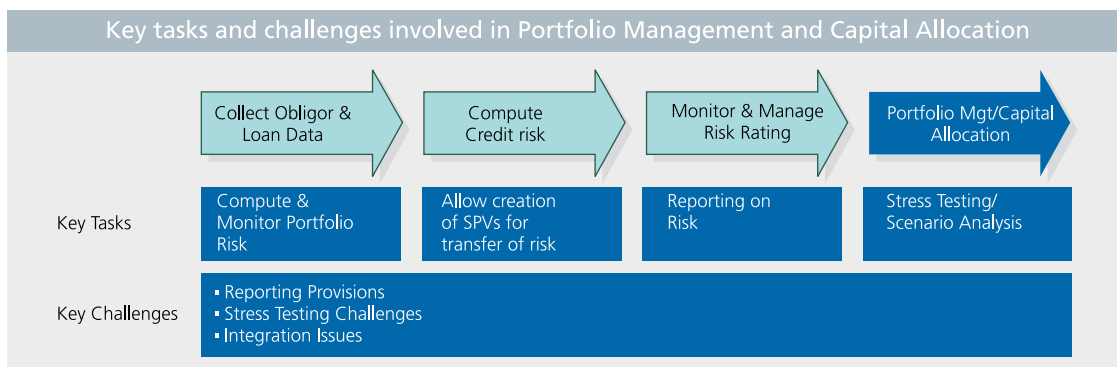


Fig 6: Key tasks and challenges involved in Portfolio Management and Capital Allocation

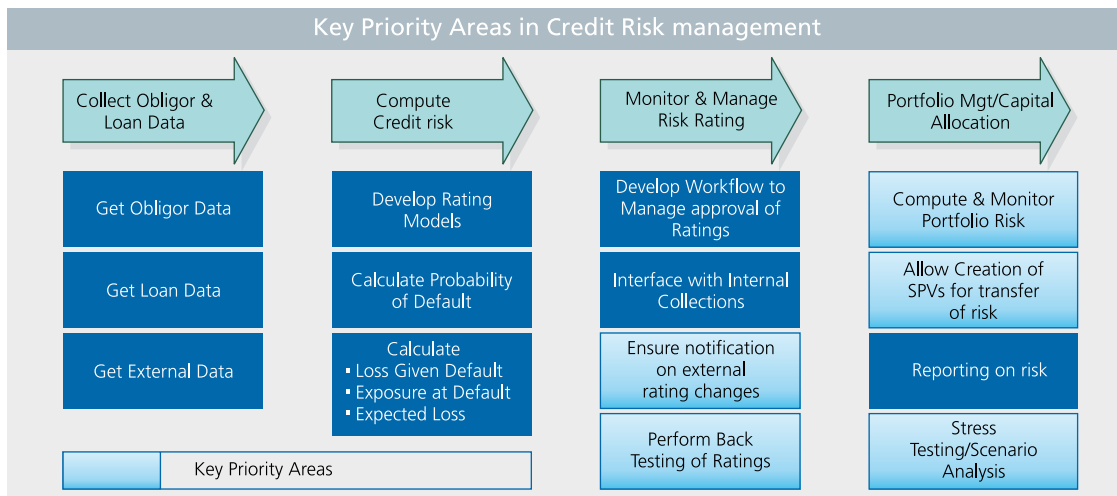


Fig 7: Key Priority Areas in Credit Risk management

**Allow creation of SPVs for transfer of risk:** The system must facilitate the creation of SPVs for the appropriate transfer of credit risk.

**Reporting on risk:** The system must be capable enough to satisfy the reporting requirements of the organization. There are different levels of reporting that are required especially in the case of portfolio management.

**Stress Testing/ Scenario Analysis:** The system should also allow for stress testing of the portfolio under differing conditions specially taking into consideration varying economic circumstances.

## Key Challenges

**Stress Testing/ Back testing challenges:** The challenge lies in gathering sufficient and accurate data to accomplish effectively back test models. Also define appropriate scenarios to perform stress testing adequately.

## Summary of the key priority areas

It will be quite safe to assume that any competitive and proactive financial institution must have already started laying down the foundation blocks of a robust credit risk management system. However it would be pertinent to summarize the key priority areas for this process. These areas are highlighted in Fig 7.

**Notification of External Rating changes:** It is crucial that an organization effectively uses a combination of internal models with external ratings. Therefore changes in the external inputs should be reflected as soon as possible in the internal ratings. This can be achieved through the use of notifications in the form of real time alerts.

**Data Architecture:** A robust data backbone is crucial to enable credit assessment process. The data backbone should have adequate and accurate data history. Care should be taken to make sure the data design incorporates relevant data fields which are required in current and future models.

**Back Testing:** The models should be properly back tested to improvise them and also for regulatory approvals.

**Compute & Monitor Portfolio Risk:** Measuring and managing individual credit ratings contribute to the management of portfolio risk. This is a crucial phase for the risk department within the organization as credit risk levels have to be maintained within statutory and organizational requirements.

**Stress testing/Scenario Analysis:** With the US economy going through a series of economic turbulences, it can be easily deduced that any credit risk management system must have the capability to handle increasingly difficult economic scenarios. Stress Testing and Scenario Analysis have become increasingly germane in understanding the behavior of a portfolio and how it affects the overall level of credit risk the organization faces.

## Components of a new CRM solution

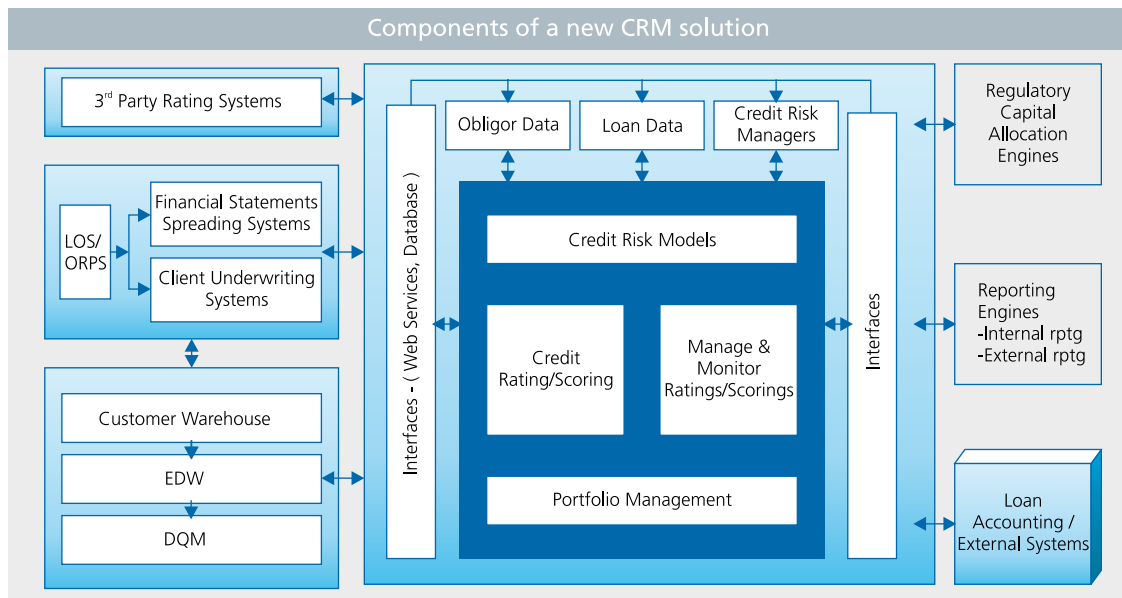


Fig 8: A comprehensive Credit Risk Management Solution

Designing a CRM solution demands a holistic view of all the components which come together to form the Credit Risk Management Solution. Although many of

these components do not serve in themselves any direct purpose, these in turn are often the source of important data.

As can be seen in the Fig 8 a comprehensive solution would take care of the following elements:

## Conclusion

It is quite clear as we take a look into the processes of a credit risk management lifecycle some processes will need

more attention going forward as companies move from a credit risk measurement to credit risk management mode. Technology will continue to play a key role and the companies that will win in the long are those that can adapt the quickest in this dynamic credit market.

Element	Characteristics
Loan Origination (Renewal) Systems Financial Statements Spreading Systems Client Underwriting Systems	<ul style="list-style-type: none"> <li>• Capture information which is essential for the credit risk solution</li> <li>• Provide essential underwriting information in terms of risk data</li> <li>• Provide spreading information</li> </ul>
Customer Warehouse Enterprise Data Warehouse (EDW) Data Quality Management (DQM)	<ul style="list-style-type: none"> <li>• Capture and store essential customer data</li> <li>• Make the data format as compatible as possible to the requirements of the risk solution</li> <li>• Should be able to adequately manage the quality of the data</li> <li>• Capture essential data back from the Credit Risk Solution</li> </ul>
3 <sup>rd</sup> Party Rating Systems	<ul style="list-style-type: none"> <li>• Compatible with the existing credit risk solution</li> <li>• Should be based on reliable PD/LGD models</li> </ul>
Interfaces	<ul style="list-style-type: none"> <li>• Such Interfaces (Web Services, Databases) help the external systems in interacting with the Credit risk solution</li> </ul>

Element	Characteristics
Credit Risk Solution	<ul style="list-style-type: none"> <li>• Flexible enough because it will be required to interact with a variety of systems</li> <li>• Robust enough to incorporate different types of risk models</li> <li>• Manageable enough so as to manage the entire credit risk lifecycle.</li> <li>• Stable enough to withstand Back-testing and validation</li> <li>• Adaptable enough to intake credit risk data from a variety of sources</li> </ul>
Portfolio Management	<ul style="list-style-type: none"> <li>• Manage the credit risk of an entire portfolio</li> <li>• Flexible enough to allow adequate changes</li> </ul>
Regulatory Capital Allocation Engine	<ul style="list-style-type: none"> <li>• Capable enough to adequately allocate regulatory capital</li> <li>• Capable of performing adequate back testing, stress testing and validations</li> <li>• Capable of performing a variety of functions which includes pricing among others</li> </ul>
Reporting Engines	<ul style="list-style-type: none"> <li>• Able to adequately generate reports for internal purposes</li> <li>• Flexible enough to generate customized reports for both managerial and technical purposes</li> <li>• Have the capability to generate all reports for Basel II and other regulatory purposes</li> </ul>
Downstream Systems	<ul style="list-style-type: none"> <li>• Capable of pulling data from the risk management solution</li> </ul>



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