Lowering Risk Exposures with IBM Credit
Risk Analytics

Prasanna Kenny, Business Analytics,
IBM India/SA
The Challenge: The Headlines Tell the Story

So Much for the Bailout; Dow Loses 157 Points
Broad-Based Selling Ensues After House Passes Package

Uncertainty Over Rescue Intensifies Credit Crisis

A Tale of Two Credit-Card Business Woes

The Crisis Goes From Bad to Worse

U.S. Mulls Widening Bailout to Insurers

Economists React: Consumer in ‘Eye of the Storm’

Bailout vexes small banks

Bernanke Says the U.S. Needs to Maintain a Role in Mortgage Securities
Credit Risk Management Landscape

- Unprecedented market turmoil
- Tighter credit restrictions juxtaposed by ongoing pressures to drive better customer service, remain competitive, and reduce operating costs
- Issue – limited visibility into risk exposures, loan portfolio performance across the organization
- Result – poor credit risk decision-making
IBM Cognos Banking Risk Performance - Credit Risk (CRP)

A Simplified Process To Detect, Control and Optimize Risks

1. Detect (Insight)
   - What are the areas of highest risk exposure?
   - How can we tell if we are exposed to credit events, such as downturns in a geography?
   - What are the profitability implications for our current portfolio?

2. Control (Prevent)
   - What major key risk indicators need to be managed?
   - What are the supporting measures?
   - How are we doing against those measures?

3. Optimize (Return)
   - What is our current risk profile?
   - What are the implications of our risk-adjusted measures?
   - Where do we need to make credit policy decisions?

Visibility
Measurement
Valuation
**IBM Cognos Banking Risk Performance – Credit Risk**

- **What is it?**
  - Agile packaged solution
  - Includes predefined warehouse and target models mapped to the IBM Banking Data Warehouse
  - Best practice analytic reports and dashboards

- **What does it do?**
  - Provide an **efficient way to identify credit risk**
  - Enables the bank to ensure that it is:
    - Originating loans that are in-line with planned diversification
    - Maintaining delinquencies at or below the planned level
    - Managing past due funds as efficiently as possible, and
    - Maintaining capital and reporting according to Basel II requirements

- **For who?**
  - Risk, Financial and Business Unit Executives

- **Why?**
  - Implosion of the sub-prime credit market and the cascading effect on every aspect of credit risk and bank profitability
  - Managing credit risk, understand its affect on income statements and balance sheets, and having the ability to monitor its contributing components
Why CRP?

For
- VP of Risk, CRO, CFO, CIO

Who Need
- To have "one view of the truth", and an integrated, enterprise wide view of credit risk across divisions, products, geographies and risk classes

IBM & Cognos Provide
- Credit Risk Performance Application
  - Analytical Applications Framework
  - Cognos 8 Dashboards
  - Mapping document to IBM Banking Data Warehouse (BDW)

IBM & Cognos Differentiators
- 'Out-of-the-box' physical data mart and operational report creation for credit risk
- Improved speed to market with lower project risk and TCO
- Open standard architecture designed to grow with customers’ needs and is capable of scaling to satisfy any known capacity or user requirement.
- Designed for use by business users across functional groups to facilitate seamless business decisions.
- Industry expertise and leadership establishing and implementing data warehouses for our financial services clients worldwide.
- A rapid solution for existing BDW users to provide robust reporting; saving customers months or even years of implementation time and cost.
CRP Application Overview

- **Basel II Reporting**
  - Basel II Portfolio Characteristics

- **Financial Oversight & Profitability**
  - Actual, Plan and Forecast
  - Balance Sheet and Income Statement Components

- **Front End Performance**
  - Delinquencies
  - Exposure
  - Portfolio characteristics

- **Origination**
  - Origination characteristics
  - Volume

- **Back-end Performance**
  - Delinquencies
  - Losses
  - Portfolio characteristics
  - Repo, Foreclosure and Bankruptcies
CRP Business Drivers and Capabilities

**Business Drivers**
- Reduce Charge Offs
- Early Credit Risk Insight
- BASEL II Compliance
- Receivables Risk
- Credit Policy Monitoring
- Financial Oversight

**Analysis Dimensions**
- BUSINESS UNIT
- PRODUCT
- GEOGRAPHY
- LOAN VINTAGE
- CREDIT SCORE
- PROBABILITY OF DEFAULT

**Credit Risk Analysis Capabilities**
- **Originations Analysis**
  - Characteristics of Loans Originated
    - Credit Score
    - Loan to Value
  - Origination Volume
- **Front End Performance**
  - Delinquency Analysis
    - Days Past Due
    - Roll Rates
  - Current Loans
- **Back End Performance**
  - Losses
  - Foreclosures
  - Repossessions
  - Bankruptcies
- **Financial Oversight**
  - Profitability
  - Loss Reserves
  - Actual v. Plan v. Forecast
  - Charge-offs
  - Delinquencies
- **Basel II Reporting**
  - Exposure at Default
  - Probability of Default
  - Loss Given Default
  - Capital Ratios
Originations Analysis

**Analysis Dimensions**
- Business Unit
- Product
- Geography
- Credit Score
- Probability of Default

**Insight to Business Questions**
- What is the volume of the loans we are originating? By product? By region? By business unit?
- What is the credit quality of the loans we are originating, measured by credit score?
- What is the average size of the loans we are originating?
- What is the size of my portfolio?
- At what rate are my loan originations growing or falling?

**Metrics**
- Originations Count
- Originations Dollar Volume
- Average Credit Score
- Average Loan Size
- Total Portfolio Size, in Dollars
- Loan Originations Growth Rate
### Analysis Dimensions

- BUSINESS UNIT
- PRODUCT
- GEOGRAPHY
- CREDIT SCORE
- PROBABILITY OF DEFAULT

### INSIGHT TO BUSINESS QUESTIONS

- How many loans and balances are 30 days, 60, and 90 days past due? By product? By region? By vintage? By Business unit?
- What is my total exposure to a given product?
- What is the credit quality of the loans in our portfolio, measured by credit score?
- How many loans are 2 or more payments behind?
- How many loans are rolling from one days past due bucket to the next?

### METRICS

- 30, 60, 90 Days Delinquent (and more)
- 2+ Delinquencies
- Average Credit Score
- Total Exposure
- Outstanding Loan Amounts
Back-End Performance

**Analysis Dimensions**
- BUSINESS UNIT
- PRODUCT
- GEOGRAPHY
- CREDIT SCORE
- PROBABILITY OF DEFAULT

**INSIGHT TO BUSINESS QUESTIONS**
- What are my gross losses? By product? By region? By business unit?
- What are my net losses?
- How many losses are the result of foreclosure? Of bankruptcy? Of repossession? Of contractual terms?
- What is the loss severity?
- How many loans were paid off?

**METRICS**
- Gross Losses
- Net Losses
- Loss Severity Rate
- Paid Off Loans (Count and Dollars)
- Losses from Repossession, Foreclosure, Bankruptcy, and Contractual
## Financial Oversight

### INSIGHT TO BUSINESS QUESTIONS

- What are my receivables? By product? By region? By business unit?
- What is the profitability of my portfolio?
- How did my actual charge-offs, delinquencies, receivables, etc compare to my planned values form those metrics?
- What is an overall snapshot of my business unit?
- What is the average loan size within my portfolio?

### METRICS

- Receivables
- RAROC
- Net Interest Margin
- Risk Adjusted Revenue
- Charge-Offs
- Delinquencies
- Credit Exposure
- Planned Receivables, Charge-offs, Delinquencies
INSIGHT TO BUSINESS QUESTIONS

- What are my Tier 1 and Tier 2 capital ratios?
- What is the distribution of my portfolio by probability of default?
- How much will my bank lose in the event of default?
- What is the total exposure the bank expects to have at default?
- What is the bank’s expected loss?

METRICS

- Probability of Default
- Expected Loss
- Loss Given Default
- Exposure at Default
- Tier 1 Capital Ratio
- Tier 2 Capital Ratio
IBM Cognos 8 Analytic Applications

**RISK ANALYTICS**

<table>
<thead>
<tr>
<th>ANALYTIC AREA</th>
<th>KPI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Credit Risk</td>
</tr>
<tr>
<td></td>
<td>• Market risk</td>
</tr>
<tr>
<td></td>
<td>• Operational Risk</td>
</tr>
<tr>
<td></td>
<td>• Liquidity risk</td>
</tr>
<tr>
<td></td>
<td>• Capital Adequacy</td>
</tr>
<tr>
<td></td>
<td>• Asset Quality</td>
</tr>
<tr>
<td></td>
<td>• Earnings &amp; Profitability</td>
</tr>
<tr>
<td></td>
<td>• Diversification</td>
</tr>
<tr>
<td></td>
<td>• Liquidity</td>
</tr>
</tbody>
</table>

**ROLE**

- Executive
- Manager

**DETECT**

- Gaps In Planned Diversification Across Geographies
- Change In Number Of Non Performing Loans

**CONTROL**

- Realign Originations To Reduce Product Concentrations
- Increase Capital Provisions

**OPTIMIZE**

- Rebalance Portfolio
- Capital Allocation
Note: The system can source from any risk source, not just the BDW.
What is in the Box?

- **Ad-hoc Query Analysis**
- **Packaged Prescriptive Insight Aligned to Key Business Drivers**
- **Dashboards Scorecards**

Packaged Adaptable Content Warehouse

**Sources**
- Source 1
- Source 2

**Other sources**
- And More…

**Teams**
- Business Analyst
- Executives & Mgmt
- LOB Specialist
Scenario:

The Chief Risk Officer logs into Credit Risk Performance...
4 pre-built dashboards come with the solution: Delinquencies, Basel II, Originations & Charge-offs

The CRO logs into the Delinquencies Dashboard
The CRO logs into the Delinquencies Dashboard

- CRO can look at 2+ delinquencies by business unit, product type, and geography
- CRO can look by balances, or by counts
- CRO sees an issue in California
The user has the ability to create an enormous variety of reports by selecting different variables from the prompts on each report page.

- The CRO chooses to look at delinquencies for the state of California over time.
- At a glance, the CRO can see that delinquencies are rising for mortgage loans in the 2nd half of 2008 as the credit crisis intensifies.
Drilling down into mortgage loans at specific products, the CRO notes that 20 Year Variable Rate Mortgage delinquent accounts are spiking.

The table below indicates that for October, the delinquencies are in the worst possible shape – 300 days or more past due.
With several accounts at 300+ days past due, the CRO wants to understand if charge-offs are rising as well.

Going to the charge-offs dashboard, the CRO notes that California is once again a trouble spot.
Once again, the CRO notes that the 20 Year Variable Rate Loans are experiencing significant problems (as are the 30 Year Fixed Rate Loans)
The CRO is now convinced that 20 Year Variable Rate Loans in California are a major area of concern.

To determine how major, the CRO wants to look at exposure to that product.

The CRO learns that this product accounts for over half of the total exposure in the Mortgage loan area as of October 2008.

As the user navigates from one report to another via the Table of Contents, the context of ‘California’ and ‘Mortgage Loans’ is passed automatically.
Concerned about the profitability of Mortgage lending on the whole, the CRO chooses now to look at RAROC for that product type

- The RAROC is poor...and getting worse
- The CRO could also have looked at Net Interest Margin or Risk-Adjusted Revenue
The CRO can do little to affect the delinquencies and charge-offs issues in the current portfolio – but the future make-up of the portfolio can be affected.

To look at recently-booked loans, the CRO goes to the Originations dashboard.

The map indicates that originations are poor in several areas...again including California.

The bar chart above also indicates that mortgages constitute much of the new business.
A look at recently-originated loans indicates that the bank is still originating a significant amount of mortgages, both 20 Year Variable and 30 Year Fixed.

The CRO wants to see if the credit quality of these is expected to be better than those that are delinquent.
A look at the portfolio by credit score tells the CRO the unfortunate truth...too many loans are still being made to people with low credit scores in California.
Differentiators:  
*Starting with Business Need in Mind*

**Design from Business Drivers to support Business Info Requirements**
Differentiators:
Adaptable

Lowest Total Cost of Ownership

- Metrics included in a set of standard analytic reports
- Build a new or modify reports
- Change business view with new templates
  - i.e. Region replaces Location
- Complete cross-functional analysis by using data from different sources
  - i.e. Organization structure
Differentiators:

Comprehensive Analytics Without any Coding of Reports!

- **Packaged Analytics**
  - Faster implementation, lower TCO
  - Consolidate information with embedded data warehouse

- **Adaptable**
  - Report changes completed in minutes not months – without coding – for reports that do not require warehouse changes

- **One Platform**
  - Industry Leading BI and Performance Management solutions
Key Benefits of Banking Risk Performance – Credit Risk

- Time-to-results accelerated by pre-built application
- Industry-leading content already built
- Application allows easy navigation across key risk metrics and dimensions
- Other Cognos 8 BI components can leverage the underlying data (alerts, scorecards, etc)
- Services can extend the scope of a project beyond the Credit Risk Performance application to include other risk types
Thank You