BANK OF AMERICA
BUSINESS CASE STUDY

COGNOS®

THE NEXT LEVEL OF PERFORMANCE™

EXECUTIVE SUMMARY

In naming Bank of America to this year's BusinessWeek 50, the publication commended the Bank for adding an impressive 184,000 new checking customers, and 196,000 new savings accounts last year. Clearly, Bank of America is a financial institution on the move. And with a plan.

Bank of America's consumer and commercial banking operations serve more than one in four households in the United States, transacting with more than 150 customers per second. The Bank operates in 29 states, and through 35 international offices, serves customers in 150 countries.

Managing this massive amount of activity is a huge undertaking. Planning for its future is even larger. And more critical. As such, the Bank sees planning, forecasting, financial modeling, and other forward-looking strategic views as a way to create and sustain competitive advantage. Key to this competitive advantage is ensuring the process of developing and understanding these forward views is as efficient as possible.

The Bank of America knew its former processes were potential drags on success. It set out to change that. And it has seen the initial success of its efforts.

BUSINESS BACKGROUND AND THE CASE FOR CHANGE

A number of constituent business elements of The Bank of America contribute to the production of forecasts, regulatory and management reports, and the calculation of reserve requirements. Within Bank Of America, each line of business, Consumer, Small Business, and Commercial, each have Loss Forecast groups, and these groups feed their forecasts into the enterprise credit risk unit. This unit produces a forecast for allowances and provisions, as well as producing regulatory and management reports. An independent Portfolio Analytics group develops forecasts using econometric models and historical data. This last group shares its work and detailed views with the lines of business Loss Forecast units, so they can learn from each other and improve the process.

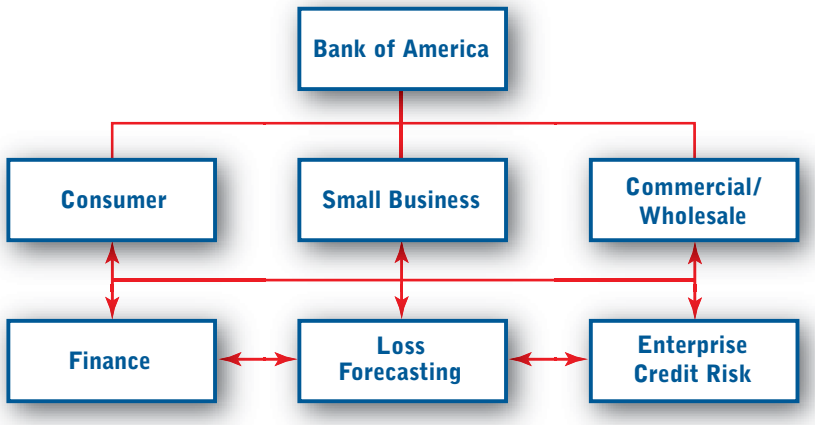


Figure 1: The relationships among Bank of America, the business units, and the Finance, Loss Forecasting and Enterprise Credit Risk areas.

Each of the Loss Forecast groups produces three high-level deliverables:

1. Forecasts for the input sources of record, such as credit losses, recoveries, non-performing assets, and risk ratings.
2. Forecasts for allowances and provisions, needed for the balance sheet and P&L.
3. Monthly management and quarterly regulatory reports.

Each line of business within Consumer and Small Business builds its forecasts with a "top-down" methodology. It applies models and trends against current, historical and forward-looking data to understand potential losses across the millions of accounts. The Commercial group, in addition to its own top-down approach, uses a bottom-up methodology, examining the loan portfolio in line-item detail, assessing issues, and then building a medium-term forecast. The long-term forecast is developed through trend analysis.

The previous processes and supporting environment used to produce forecasts and reports were extremely time-consuming and manual. It was difficult for the groups to accomplish their tasks in a timely, high-quality fashion.

- There were multiple, disparate data repositories for model and forecast output.
- There was no reliable way to reproduce the results and it was difficult to explain after the fact how results were produced.
- Analytic capabilities were limited.
- Communication and distribution of information was manual, primarily via Microsoft® Excel spreadsheets and e-mail.
- There was no ability to provide automated triggers or alerts.
- Tracking and control charting was accomplished manually.
- There was very limited flexibility in the reporting views relative to dynamic business rules.
- Finally, there was little or no automated monitoring of key performance metrics related to the process itself.

ENTER PROJECT EPIC

Business executives and managers lacked trust in the current loss forecasting process due to the number of issues (noted above.) When someone challenged the numbers or forecast estimates, it was almost impossible to recreate them and document the process. Additionally, there was little time to think about the results of the various analyses, since so much effort went into the production process. The lack of a reliable process negatively affected the various business operations planning areas, such as staffing for the collections group.

The Risk Solutions unit within Bank of America launched Project EPIC to address this situation within the Consumer and Small Business loss forecasting process. This unit has about 30 million customers with about 60 to 90 million accounts, and $358 billion in outstanding debt. Success here would show the potential efficiencies, and with this win, the project could expand.

The primary goal of Project EPIC was to make the necessary process changes to improve the end-to-end loss forecasting workflow/reporting efficiency. Using Six Sigma methodology, the team began first by listening to the internal customers—the business leaders at Bank of America—who voiced their "critical to quality" requirements for the target process. Next, it documented the current environment and provided a diagnosis and business case for specific improvement projects. One of the spin-off projects, to examine the Information Technology systems and applications with the objective of developing a long-term, 'multi-generation' solution, has begun. This spin-off effort, known as Project Octopus, looks at the enterprise level end-to-end loss forecasting process.

Project objective

The project aimed to deliver an infrastructure that would turn the Loss Forecasting process from 'core competency' to 'competitive advantage.' It would fulfill this goal through process improvements and a dynamic performance measurement system. A more reliable process, one that could be properly governed, audited, and measured, would deliver a "single, reliable version of the truth" to the business.

The development and use of forecasting models was not included in this initial scope. However, the goal of achieving this "single, reliable version of truth" that would be transparent to management and external review was deemed to be sufficient justification to proceed.

THE SOLUTION

Objectives

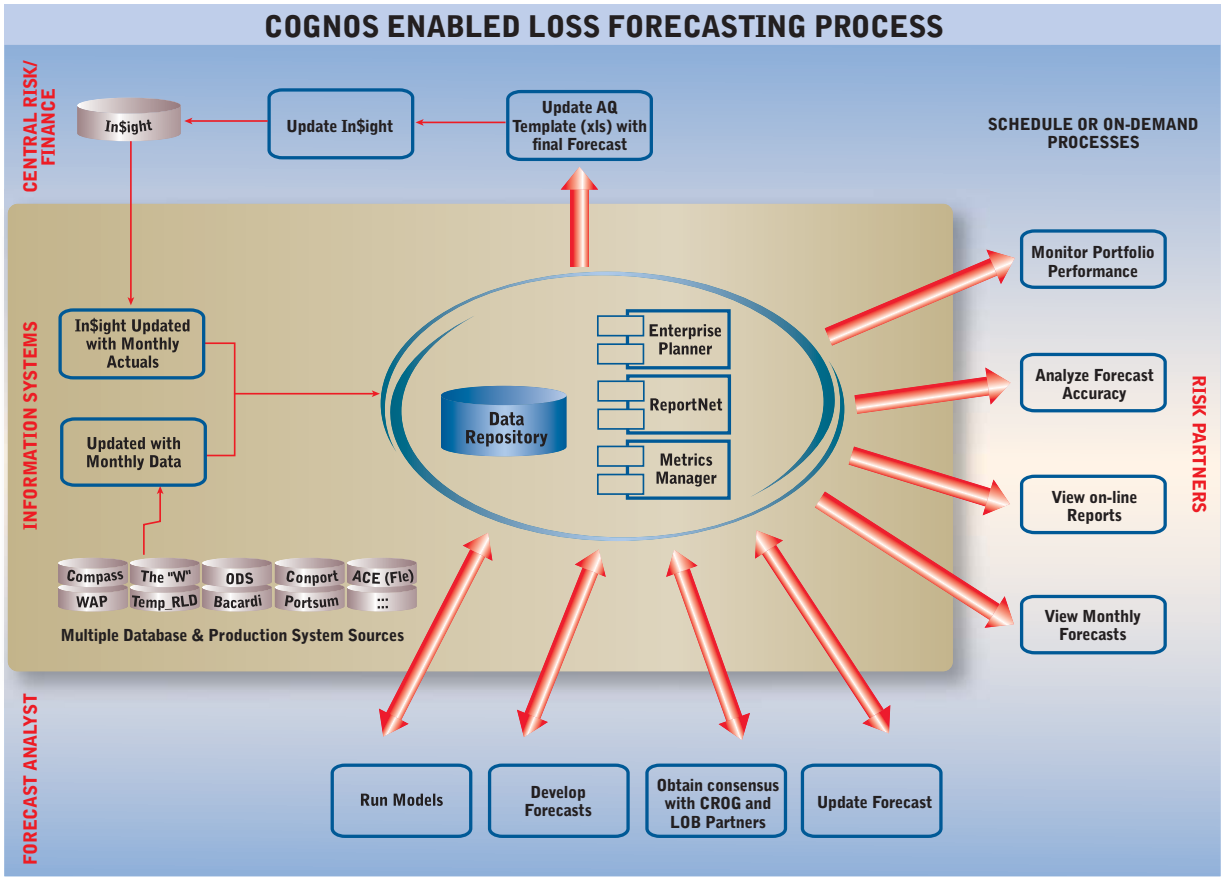
Bank of America has set three key objectives as it improves planning and forecasting with Project EPIC:

- Enable and drive the performance management cycle for Loss Forecasting by:
  - Integrating planning, budgeting, forecasting, reporting, and financial analytics into a single end-to-end process.
  - Providing transparency for the links between Asset Quality forecast and the provision for Reserves and other expenses based on Loss Forecasting.
  - Closing the loop between planning and performance management within the Loss Forecasting process.
  - Delivering an accurate, effective and efficient process to align planning activities across Risk Solutions.
  - Supporting quick turnaround and multiple analyses / scenarios, including sensitivity analyses.
- Ensure integrity, accountability / ownership and timeliness of financial reports, forecasts and plans.
- Design and develop a scalable technology solution. This is especially important because the Bank is currently in the trough of the current cycle.

The solution architecture

Bank of America's solution for Consumer and Small Business is EPIC, the Enterprise Planning Information Center. It is an integrated suite of planning, reporting, and analytic tools that are connected to a single data store repository. This repository is itself fed by a number of different source systems, data marts and individual contributors located within each line of business. The Bank of America data warehouse, called "The W", is the largest of these. Built on a Teradata-platform, "The W" consists of many different data models and data marts. The number and diversity of these marts and models has grown over time because of the Bank's growth through acquisition. Another major source for EPIC's data repository is BACARDI, the Bank of America Card Database. Other sources include the Corporate Treasury Data Mart (CTDM), the dealer financial system, and In$ight, the financial system.

The former process, which EPIC is currently addressing, was exceedingly complex. The Bank had to transfer the actual accounting data (itself in a variety of formats) from multiple systems. For example, complexity increases because of the necessary negotiating and adjudicating of various versions of loss forecasts and asset quality estimates among the constituents of the process. In the previous process, this was time consuming, cumbersome, and prone to error because it was based on spreadsheets and email. The new, automated system turns this into a reliable and efficient process. Perhaps more importantly, it also supports appropriate governance processes for the various versions of models. This means it can manage and measure quality.



Implementation approach

There are two major aspects to the Bank's approach for implementing Project Octopus:

- Start small and build the new capabilities gradually.
- Leverage initial process improvement activities and insights. The Bank had first attempted to improve its processes with existing technology (manual processes based upon standard Microsoft Office tools). The Bank concluded that it would receive limited benefits; it required new technology to achieve its competitive advantage goal. However, the initial exercise generated a better understanding of the issues.

Project EPIC is developing new capabilities for the Loss Forecasting process. Lessons learned from this effort will expand to the other groups within Asset Quality. Further expansion to other business partners in the end-to-end forecasting process, including CROG (Consumer Risk Operations Group), Enterprise Risk, and Finance is currently being planned for rollout late 2006. Each group has unique needs: the Bank realizes that common processes are just the beginning of an end-to-end process that is shared, reliable, and consistent. For each new expansion, it must gather the full set of business requirements, analyze them, and then plan for the full solution.

Even with the initial rollout, Loss Forecasting, the new process was implemented in two stages. The Bank first tackled the full-year planning process, and then, the monthly forecasting process.

In developing the new business processes for Loss Forecasting, the Project followed Six Sigma methodology, specifically:

- Clearly identify, size, and frame the current process flow.
- Define, prioritize, and build the new process flow.
- Assign resources and ownership.
- Identify and develop the sample business cases.
- Create the new environment.
- Build the first application.

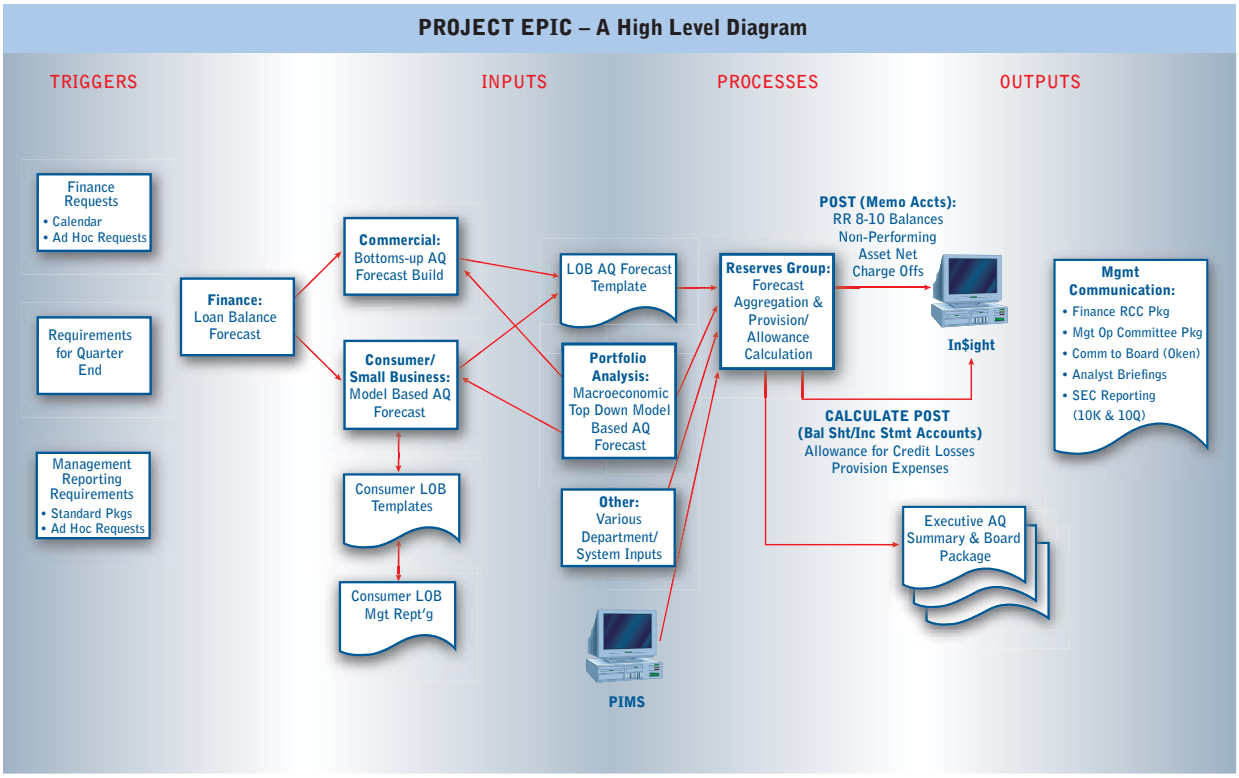
As is the case with virtually all successful Information Technology projects, the more time and care put into business process design—before you even start building an application—pays dividends in quality, efficiency, and alignment.

Scope and timing

The Bank completed its Loss Forecasting project in six months, from a start in March 2005, and delivery of the first forecasts took place September 6, 2005. The Bank prepared the annual plan using the new tools in October. With this annual process in place, the monthly application went live in October 2005, and the first full evaluation of that capability will be in the third quarter of 2006.

There are several dozen users of this system. Four are 'contributors', who develop the forecasts, and the others are 'users' of the reports and data cubes.

Systems and technical architecture integration



BUSINESS IMPACT

Encouraging results to-date

Project EPIC is a tactical initiative with long term potential. Its primary objectives are important to the Bank as a means for creating competitive advantage in core business processes. The results to date are encouraging.

- **Higher quality:** The improved output accuracy means less re-works and resends, less duplicative manpower and therefore, an increase in capacity. Fewer people can now accomplish the process, enabling the Bank to redeploy resources to other functions that were unaddressed previously, such as additional analyses of trends. The result: overall quality goes up.
- **Speed of execution:** The project speed and speed of forecast preparation are impressive. Business executives are "astonished at the speed at which we delivered," said David Schultz. What had taken as much as a week can now be done in about an hour. The timeliness of the analysis allows executives to know where you are, at any point in time.

- **Increased process effectiveness:** Increased quality and speed enhances the Bank's ability to mitigate credit risks. The earlier management is aware of new, risky situations, the faster it can set and implement its response plan. Although the actual process cycle time has not changed, there is a greater ability and intent to run ad hoc cycles to assess the impact of new events in the middle of the month. The Hurricane Katrina disaster is a clear example of how important this can be.
- **Impact on Bank reserves:** As a related benefit, the Bank has a greater understanding and insight into Reserve levels, although the Reserve computations themselves have not been affected. This enables sharper hedging strategies to reduce operational risk.
- **Improved transparency:** Sarbanes-Oxley requirements mandate greater transparency for key internal processes, including Loss Forecasting. Centralizing the staging process for Loss Forecasting results creates one place for executives to see the data, improving transparency and ease of access.
- **Improved audit trail:** The overall governance and auditability of the new process raises confidence in the forecasts. For example, the new process supports the ability to track data versioning.
- **Vastly improved flexibility:** The system can react quickly to organizational changes, new lines of business, new market segmentations, and more. These modifications can all be accomplished within the system. For example, it will be far simpler to perform restatements of historical data automatically after reorganizations. Previously, the Bank had to painstakingly update a host of linked spreadsheets for each such change.

Performance metrics for the loss forecasting process

The Loss Forecasting process is essential to the process of establishing Reserves for the Bank. As a result, the Bank has developed specific metrics to understand progress in this area as the project continues to roll out. These include:

- Number of staff-hours to produce the forecasts and the various steps involved.
- Timeliness of submissions of deliverables and inter-departmental communication of results.
- Number of scenarios produced (e.g. monthly high/low scenarios, forward-loss sensitivity, back-testing).
- Customer satisfaction.

ROI

Quantitative return on investment has not been computed as yet. However, the Bank has measured its baseline state, so it can make comparisons with the new processes and systems once it has steady-state operation.

In terms of staff efficiency, the initial estimate is that the process can now be performed with 20 percent fewer full-time equivalent staff.

LESSONS LEARNED

While Project EPIC was a tactical approach, Project Octopus is a long-term, complex undertaking. Recognizing this, the Bank chose to address the business issues first and bite off small pieces. It draws out three important lessons from its efforts to date.

Define the underlying processes before implementing tools.

Considerable time was taken to improve and define the underlying processes involved in Loss Forecasting before commencing with the EPIC Project. In the Bank's mind, this was the single most important contributing factor to the success of the effort.

Choose a relatively small scope to prove the concept.

By getting started small, the EPIC Project was able to get funding without major effort. Nevertheless, they captured management attention with their success because of the dramatic impact on the business process of Loss Forecasting.

Identify and engage an executive sponsor.

Project Octopus and the EPIC Project identified and benefited from the oversight and support of Leslie Fitzgerald, Senior Vice President of Bank of America, responsible for Loss Reserves.

These lessons learned will help as the EPIC Project expands to deliver on the vision of Project Octopus.

WHY COGNOS?

Bank of America chose Cognos tools because they were a "perfect fit" for supporting the planning process for Loss Forecasting as defined in the process improvement stage that preceded the EPIC effort. These requirements included the following:

- Ability to deploy a multi-user, flexible forecasting and planning platform.
- Ease of implementation for the development team.
- Ability to deliver ad hoc reporting capability.

In addition, Cognos demonstrated a willingness to work within the business organization to refine the process as the system development effort continued.

Specifically, Bank of America chose these elements of Cognos performance management technologies: PowerPlay®, ReportNet®, Enterprise Planning, and Metrics Manager. All of these elements are working together to support Bank of America's new Loss Forecasting process.

GOING FORWARD

More comprehensive utilization of the new automated process

The Bank is already working to expand the use of Cognos performance management software and the associated processes beyond the Loss Forecasting unit to the other groups within Risk Solutions. There are business process differences in these areas that will require adapting the processes now running in Consumer and Small Business.

These requirements include the following:

Within the Loss Forecasting process

- Generating reserves forecasts.
- Supporting name-by-name bottom-up forecasting.
- Support for Present Value calculations required by FASB 414.

Outside of Loss Forecasting

- Centralized reporting/analysis for Acquisitions Scorecard Monitoring.
- Portal for Market Risk and Reward reporting/analytics
- Additional requirements for supporting the manipulation of reports.

The Bank is working on detailing these requirements and guiding the expanded use of the technology developed in the EPIC Project as it pursues the full objectives of Project Octopus.

Printed in Canada
(06/07)

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