

July 2007

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ROI CASE STUDY **SAS BUSINESS INTELLIGENCE** **IBM**

THE BOTTOM LINE

IBM deployed SAS BI for its 300mm semiconductor business to leverage existing Base SAS software data and provide users with direct access to reports, improving data consistency and visibility while avoiding IT costs.

ROI: 386%

Payback: 3.2 months

THE COMPANY

IBM is a global technology company with customers in 170 countries. The IBM 300mm semiconductor facility in East Fishkill, New York, combines IBM's array of leading-edge chip-making technologies with the economies of scale resulting from production of chips on larger, 300mm diameter silicon wafers.

THE CHALLENGE

The semiconductor facility makes frequent changes in operations as IBM invests in new technologies with different requirements, and making those changes rapidly is key to staying on the cutting edge in the semiconductor market. IBM had used Base SAS software at the facility for a number of years and a team of programmers was responsible for managing the code and generating custom reports on an as-needed basis. In 2005, IBM found that the reporting programming team was having difficulty keeping up with the reporting requirements for the engineering and manufacturing teams, and it wanted to make report creation easier so individual users would have more rapid access to the information they needed. IBM also wanted to ensure that it could maintain the integrity of the data even if many more users had access to it.

THE STRATEGY

IBM considered a number of options and chose SAS Business Intelligence largely because it had already had its foundation code in Base SAS software and SAS Business Intelligence would be easier to implement over Base SAS software than another solution. IBM installed the software in late 2005 and started to ramp up its use in 2006. IBM performed some minor customizations of SAS Business Intelligence to make it more appropriate for use at IBM, and deployed to 25 super users to test further customizations that were made to support the more than 100 data sources and 100 gigabytes of data supported by the environment. The report programming team worked with the initial power users to develop training materials and conduct the training for the engineering and manufacturing teams. Power users received a week of training; other users underwent between a

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few hours and a day of training depending on their skill and usage level, and IBM added 45 to 50 new users a month to reach its current deployment size.

Today, more than 600 users access SAS Business Intelligence on a regular basis to generate reports for managing day-to-day operations and decision making:

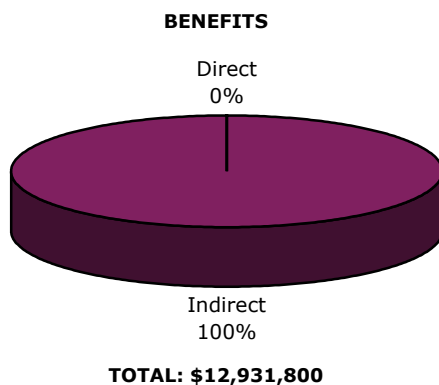
- The reporting programmer team develops basic reports that can then be reused and customized for individual users' needs.
- Power users have learned over time to build their own reports.
- Automated report and presentation generation on a daily basis ensures all managers have access to the information they need before the daily plant meeting.

IBM began with one processor on the server dedicated to SAS Business Intelligence and has now grown to devote five processors to the application to ensure it can support the volume of queries from its users.

KEY BENEFIT AREAS

Deploying SAS Business Intelligence has enabled IBM to put reporting tools directly into the hands of its end users, ensuring consistent access to information for better decision making. Key benefits from the solution include:

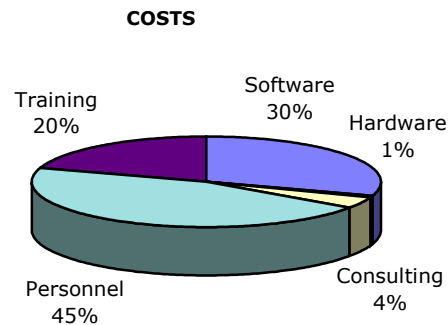
- Reduced daily presentation time. Now presentations for the daily executive meeting are automatically generated, eliminating the technician time so they can spend more time on higher-level tasks.
- Reduced report creation time. Managers can access the reports they need and make changes and updates as needed, reducing the amount of time spent developing reports and requesting data.
- Improved visibility. Because standard reports are updated daily in a dashboard for executives, they can quickly identify trends or problems.
- Improved data accuracy. Because users can access the data directly and automatically update key reports, they can ensure they always have access to the most up-to-date and accurate data.



- Avoided IT staff. Because users can develop and customize their own reports, IBM has been able to significantly grow its reporting capabilities without adding reporting programmers: since the deployment more than 1,000 new reports have been created without IT intervention.

KEY COST AREAS

Key cost areas for the deployment included personnel, software, and training. Both consulting and hardware made up less than 5 percent of overall project costs. Consulting costs were low because IBM was able to manage most of the implementation with its own internal staff. Hardware costs were low because another group at the facility was discarding a server so the project team was able to acquire it for minimal cost.



TOTAL: \$2,118,780

LESSONS LEARNED

As user adoption grew, IBM found that having a clear plan for the volume of data and the types of queries generated ensures users don't have problems with system performance. SAS has helped IBM over time to fine tune the delivery of the software through the java engine and Web applications on the IBM side to improve performance as super users ran more and more complex reports.

CALCULATING THE ROI

Nucleus calculated the costs of software, hardware, consulting, personnel, training, and other investments over a 3-year period to quantify IBM's total investment in SAS Business Intelligence.

Direct benefits quantified included the avoided cost of hiring additional IT staff that would have been needed to support IBM's volume of report generation without the new application. Indirect benefits included savings for engineering and manufacturing managers and other employees who save between 15 minutes and an hour per day by using the application. Productivity savings were quantified based on the time saved and the average fully loaded cost of each group of employees, using a correction factor to account for the inefficient transfer of time between time saved and additional time worked. Not quantified are the returns IBM receives from making better decisions through greater visibility into day-to-day operations.

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DETAILED FINANCIAL ANALYSIS

IBM

SUMMARY

Project:	SAS BI
Annual return on investment (ROI)	386%
Payback period (years)	0.27
Net present value (NPV)	3,823,740
Average yearly cost of ownership	706,260

ANNUAL BENEFITS	Pre-start	Year 1	Year 2	Year 3
Direct	0	0	0	0
Indirect	0	4,310,600	4,310,600	4,310,600
Total Benefits Per Period	0	4,310,600	4,310,600	4,310,600

DEPRECIATED ASSETS	Pre-start	Year 1	Year 2	Year 3
Software	211,000	211,000	211,000	0
Hardware	15,000	0	0	0
Total Per Period	226,000	211,000	211,000	0

DEPRECIATION SCHEDULE	Pre-start	Year 1	Year 2	Year 3
Software	0	42,200	84,400	126,600
Hardware	0	3,000	3,000	3,000
Total Per Period	0	45,200	87,400	129,600

EXPENSED COSTS	Pre-start	Year 1	Year 2	Year 3
Software	0	0	0	0
Hardware	0	0	0	0
Consulting	87,500	0	0	0
Personnel	26,000	312,000	312,000	312,000
Training	421,280	0	0	0
Other	0	0	0	0
Total Per Period	534,780	312,000	312,000	312,000

FINANCIAL ANALYSIS	Year 1	Year 2	Year 3
Net cash flow before taxes	3,787,600	3,787,600	3,998,600
Net cash flow after taxes	1,810,900	1,832,000	2,064,100
Annual ROI - direct and indirect benefits			386%
Annual ROI - direct benefits only			-51%
Net present value (NPV)			3,823,740
Payback (years)			0.27
Average annual cost of ownership			706,260
3-year IRR			366%

FINANCIAL ASSUMPTIONS

All government taxes	50%
Discount rate	15%