

APPENDIX III. IBM Business Consulting Services Executive Summary

EXCERPT FROM THE IBM BUSINESS CONSULTING SERVICES REPORT “*Government Performance and Results Act (GPRA) Performance Measurement Validation and Verification*” December, 2002

Executive Summary

“The National Science Foundation (NSF), as a Federal agency, is subject to the performance reporting requirements of the Government Performance and Results Act (GPRA). Accordingly, NSF developed a series of performance goals to help the agency meet its mission, goals, and objectives. The Foundation asked International Business Machines Corporation (IBM) Business Consulting Services (predecessor organization – PricewaterhouseCoopers Consulting) to assess whether the methods that NSF uses to compile and report selected FY 2002 performance results are verifiable and valid. This is the third consecutive year that we have performed this assessment.

We commend NSF for undertaking this third-year effort to confirm the reliability of its data and the processes to collect, process, maintain, and report this data. From our fiscal year (FY) 2002 review, we conclude that NSF has made a concerted effort to ensure that it reports its performance results accurately and has effective systems, policies, and procedures to ensure data quality. Overall, NSF relies on sound business practices, system and application controls, and manual checks of system queries to report performance. Further, our efforts to re-calculate the Foundation’s results based on these systems, processes and data were successful.

The United States General Accounting Office (GAO) has directed federal agencies to provide confidence that the policies and procedures that underlie GPRA performance reporting are complete, accurate and consistent. To address GAO’s mandate and past concerns, NSF asked us to conduct an independent verification and validation⁴⁰ review of selected 2002 quantitative and qualitative results contained in the FY 2002 NSF GPRA Performance and Accountability Report.

The FY 2002 performance goals we reviewed fall under four categories:

- Management goals being reviewed for the first time (7 goals)
- Management goals receiving an update review (8 goals)
- EHR performance goal receiving an update review (1 goal)
- Facilities Goals receiving a limited review, focused on data, results and FY 2002 improvement efforts (4 goals)

As part of our review of the processes and results for these selected performance goals, we:

- Assessed the accuracy of NSF’s performance data and reported outcomes of performance goals and indicators
- Described the reliability of the processes NSF uses to collect, process, maintain, and report data
- Reviewed system controls to confirm that quality input results in quality output
- Created detailed process descriptions and process maps for those goals being reviewed for the first time

⁴⁰ GAO defines “verification” as a means to check or test performance data in order to reduce the risk of using data that contains significant errors. GAO defines “validation” as a way to test data to ensure that no error creates significant bias.

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- Identified changes to processes and data for those goals receiving an update review

We applied GAO's *Guide to Assessing Agency Annual Performance Plans* (GAO/GCD-10.1.20) to guide our review. Based on GAO guidance, we assessed whether NSF's processes to collect, process, maintain and report data meet the following criteria:

- Does the process provide for periodic review of collection, maintenance, and processing procedures to ensure they are consistently applied and continue to be adequate?
- Does the process provide for periodic sampling and review of data to ensure completeness, accuracy, and consistency?
- Does the process rely on independent audits or other established procedures for verifying and validating financial information when performance measures require the use of financial information?
- Does NSF address problems, in verification and validation procedures, known to GAO or the agency?
- Does the agency recognize the potential impacts of data limitations should they exist?

We did not consider the appropriateness of NSF's performance goals or indicators in our assessment of the validity of NSF's reported results. Rather, our validation is based strictly on whether NSF achieved or did not achieve its performance goals based on the indicators established by NSF in the FY 2002 Performance Plan or other appropriate NSF citations.

Results and Recommendations

We determined that NSF has reported on all 19 management goals and one EHR performance goal under review in a manner such that any errors, should they exist, would not be significant enough to change the reader's interpretation of the Foundation's reported outcome in meeting the supporting performance goal. Overall, NSF relies on sound business processes, system and application controls, and manual checks of system queries to report performance. We believe that these processes are valid and verifiable.

We summarize the results of our review for each performance goal in Table 1. We indicate the results of each goal as reported by NSF in the "NSF Result" column. In the "Process Check" column, a check symbol (✓) indicates that we were able to verify the reliability of NSF's processes to collect, process, maintain and report data. In the "Result Check" column, a check symbol indicates that we were able to validate the accuracy of the NSF's reported result for the corresponding performance goal. Where appropriate, we also include comments with respect to "Areas for Improvement" and "Recommendations."⁴¹ These areas for improvement and recommendations are discussed in greater detail in the balance of this report."

⁴¹ "The areas of improvement" and "Recommendations" are not included in the reproduced table presented on the following pages.

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FY 2002 Performance Goal	NSF Result	Process Check	Result Check
Management goals reviewed for the first time in FY 2002			
IV-3: Program Officers will consider elements of both generic review criteria in making decisions to fund or decline proposals.	Achieved	✓ - ⁴²	✓
IV-6: Establish a baseline for participation of members of underrepresented groups in NSF proposal review activities.	Not Achieved	✓	✓
IV-8: NSF will develop and initiate a risk assessment / risk management plan for awards.	Achieved	✓	✓
IV-12: NSF will implement an agency-wide security program in response to the Government Information Security Reform Act.	Achieved	✓	✓
IV-14: NSF will establish an internal NSF Academy to promote continuous learning for NSF staff.	Achieved	✓	✓
IV-15: NSF will initiate a strategic business analysis to provide a comprehensive perspective on its future workforce requirements.	Achieved	✓	✓
IV-16: NSF will establish various baselines that will enable management to better assess the quality of work life and work environment within the Foundation.	Achieved	NA ⁴³	✓
Management goals receiving an update review			
IV-1: At least 85% of basic and applied research funds will be allocated to projects that undergo merit review.	Achieved	✓	✓
IV-2: Reviewers will address the elements of both generic review criteria at a level above that of FY 2002.	Achieved	✓	✓
IV-4: Ninety-five percent of NSF program announcements will be available to relevant individuals and organizations at least three months prior to the proposal deadline or target date.	Not Achieved	✓	✓
IV-5: For 70 percent of proposals, be able to inform applicants whether their proposals have been declined or recommended for funding within six months of receipt.	Achieved	✓	✓
IV-7a: NSF will increase the average annualized award	Achieved	✓	✓

⁴² We provide a check minus for this goal because of the number of areas for process improvement we have identified.

⁴³ NSF was not able to implement this goal because the Office of Personnel Management (OPM) did not provide the necessary survey data by the end of FY 2002. Consequently, we are not able to verify NSF's processes, since they were not completed. However, we can validate NSF's reported result that it did not meet this goal for FY 2002.

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FY 2002 Performance Goal	NSF Result	Process Check	Result Check
size for research projects to a level of \$113,000, compared to a goal of \$110,000 in FY 2001.			
IV-7b: NSF will maintain the FY 2002 goal of 3.0 years for the average duration of awards for research projects.	Not Achieved	✓	✓
IV-11: NSF will continue to advance the role of "e-business" in review, award, and management processes.	Achieved	✓	✓
IV-13: NSF will show an increase over FY 2000 in the total number of hires to NSF science and engineering positions from underrepresented groups.	Achieved	✓	✓
III-1b: After three years of NSF support, over 80 percent of schools participating in systemic initiative programs will: Implement a standards-based curriculum in science and mathematics with at least one-third of their teachers; Provide professional development for at least one-third of their teachers; and Improve student achievement on a selected battery of math and science tests at one or more of three educational levels (elementary, middle and high school).	Achieved	✓	✓
IV-9a: For 90% of facilities, keep construction and upgrades within annual expenditure plan, not to exceed 110% of estimates.	Achieved	NA ⁴⁴	✓
IV-9b: Ninety percent of facilities will meet all major annual schedule milestones.	Not Achieved	NA	✓
IV-9c: For all construction and upgrade projects initiated after 1996, when current planning processes were put in place, keep total cost within 110% of estimates made at the initiation of construction	Achieved	NA	✓
IV-10: For 90 percent of facilities, keep operating time lost due to unscheduled downtime to less than 10 percent of the total scheduled operating time.	Not Achieved	NA	✓

⁴⁴ We reviewed NSF's processes for its management facilities goals in FY 2001. This year's process review focused on the status of select NSF process improvement initiatives, resulting from our FY 2001 recommendations. Because we did not do a full process review this year, we have inserted "NA" in the process check column. We did test the results of the facilities goals for FY 2002 and have noted our results in the result check column. Please see Section 5 for further details.