



The Total Economic Impact™ of BMC Software's PATROL Performance Assurance Solutions

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Technology advice.
Business results.

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Executive Summary

Introduction

In November 2002, Giga Information Group commenced work on a research project commissioned by BMC Software that focused on examining the potential return on investment (ROI) enterprises might realize by adopting PATROL Performance Assurance solutions.

This report highlights the benefits and costs of deploying BMC Software PATROL Performance Assurance solutions across the enterprise of a sample organization (see Appendix A, Description of Sample Organization). The findings in this study are in large part based on interviews conducted with four organizations currently using BMC Software's Performance Assurance products. The report examines the estimated ROI for the sample organization and represents the aggregate findings derived from the interview and analysis process as well as the independent research of Giga Information Group.

PATROL Perform and Predict together support a comprehensive methodology called Performance Assurance, which encompasses capacity planning for the organization's investors, performance engineering for the application owner and performance management for the operations manager. PATROL Performance Assurance products help organizations more accurately measure, manage and improve system and application performance. Performance management improves the ability to understand how business applications are performing, identify and resolve issues and optimize performance to cost effectively meet service-level goals. This report focuses on PATROL Perform and Predict products for distributed systems, and does *not* address BMC's MAINVIEW Predict product, which is a tool for S/390 mainframe systems.

The findings in this study are based on interviews conducted with four organizations that use PATROL Perform and Predict, as well as the independent research of Giga Information Group. Industries represented by these four organizations include: retail, financial services and insurance. A brief description of each organization follows:

1. A large diversified financial services company with more than 100,000 employees worldwide
2. One of the largest food supermarket retailers with more than 1,500 stores in the United States and Canada
3. A Fortune 500 insurance and financial services organization with offices throughout the US and Europe
4. A leading auto and home insurance company with more than 50,000 employees in North America

About Total Economic Impact™

BMC Software selected Giga Information Group, a leading global IT advisory firm, for this project because of Giga's Total Economic Impact™ (TEI) analysis methodology, which not only measures costs and cost reduction (areas that are typically accounted for within IT) but also weighs the enabling value of a technology in increasing the effectiveness of overall business processes. Giga employed four fundamental elements of TEI (see Appendix B: Total Economic Impact™ Primer) in modeling the ROI of using PATROL Performance Assurance solutions:

1. Costs (TCO)
2. Benefits and cost reduction
3. Flexibility benefits
4. Risk

Given the increasing sophistication that enterprises have regarding cost analysis related to IT investments, Giga's TEI methodology serves an extremely useful purpose by providing a complete picture of the Total Economic Impact of purchase decisions.

Key Findings

Giga Information Group research shows that implementing PATROL Perform and Predict solutions can provide benefits to organizations. Productivity savings can be achieved by IT organizations in the area of performance management activities, as well as productivity improvements for interactive, transaction-oriented end users as a result of increased system availability and reliability and improved response times. However, each of the four organizations interviewed discovered the cost of deployment is fairly high. To portray all the costs and benefits, Giga built an ROI model based on a sample organization purchasing and implementing BMC Software's PATROL Perform and Predict solutions (see Table 1).

Giga's summary findings based on the model for our sample organization are as follows:

- The three-year ROI is calculated at 35 percent (risk-adjusted).
- The net present value (NPV) of the cash outflows or costs associated with this implementation over three years was \$6,120,385 (risk-adjusted) (see Figure 2 for details).
- The NPV of the cash inflows or benefits associated with this implementation over three years was \$7,978,155 (risk-adjusted) (see Figure 3 for details).
- The NPV of the flexibility options associated with this implementation over three years was \$303,006 (risk-adjusted) (see Flexibility of Performance Assurance Solutions section of this study).

Table 1: Financial Results — Sample Organization

Three-Year ROI Analysis	Unadjusted	Risk-Adjusted
TEI (return on investment)	46%	35%
Payback period	Within 17 months	Within 19 months
Net present value of costs	\$6,026,070	\$6,120,385
Net present value of benefits	\$8,423,296	\$7,978,155
Net present value — flexibility	\$351,779	\$303,006

Source: Giga Information Group

Our sample organization is a global financial institution with five major data centers and 400 remote branch offices. It has about 5,000 distributed system servers, of which it plans to apply performance management tools to 2,000 servers (approximately 400 per data center). These specific servers support applications that are predominately client/server and include firewalls, gateways, Web servers, RDBMSes and application middleware (see Appendix A for a more detailed description of our sample organization).

Prior to implementing PATROL Perform and Predict solutions, the sample organization had several strategic goals and objectives it was trying to achieve by implementing a performance management solution:

- Reduce IT hardware costs
- Enable system performance to be viewed and measured in business terms by improving system availability and response times for critical productivity and revenue applications
- Enhance the ability to identify, troubleshoot and diagnose abnormal behavior in the systems, applications and users' environment
- Reduce performance risk

For our sample company, the risk-adjusted payback period occurred 19 months after the initial deployment. ROI was 35 percent on a risk-adjusted basis. If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed since the risks that threaten the project have already been taken into consideration and quantified.

Flexibility benefits for our sample company during a three-year period were \$303,006 (risk-adjusted). The flexibility component of TEI captures that value using the industry standard Black-Scholes options valuation formula. Using BMC's Perform and Predict solution, our sample company discovered there was enough server capacity in the current infrastructure to support new applications and/or upgrades. Furthermore, this immediately available capacity gives the company the "option" to accelerate the implementation of the applications, enabling it to take earlier advantage of any productivity and/or revenue benefits. Without performance management tools, most companies would purchase an additional server to support the new application, thereby delaying implementation by the four- to eight-week procurement process, which includes vendor quotes, internal review and approval, vendor selection and purchase, delivery and installing a new server. Having the future ability to accelerate benefits has a present-day value that TEI includes in our ROI analysis.

For the purposes of the sample organization, these performance assurance products and services are priced at a common discount off BMC Software's list price as of October 2002 (see Appendix A, Vendor Pricing Assumptions for Sample Organization). Other organizations may incur different licensing and implementations costs; therefore, Giga makes no assumptions that other organizations will achieve results similar to those cited in this report.

ROI will vary significantly from one company to the next. Organizations should use Giga's research as a guide in their decision-making process when considering PATROL Perform and Predict solutions.

Giga Position on Infrastructure Performance Management Projects

In recent research, Jean-Pierre Garbani, Director at Giga Information Group, wrote:

“In a tight economy, infrastructure performance management projects get an ambivalent reception. On one hand, they are perceived as a way to optimize an existing investment and generate savings. On the other hand, the price tag is usually substantial and the amount of resources and effort needed to implement new process and organizational changes is significant.

“In organizations where IT is considered ‘just a cost center,’ the only way to justify such a project is through cost reduction, which will considerably limit its appeal, especially if current IT performance is considered either adequate or a non-issue.

“If IT is placed in its true context, as a way to improve business productivity, a simple cost analysis is no longer sufficient since it lacks the capability to evaluate all the potential benefits of undertaking such a project. Giga’s TEI model validates such an approach since it considers the value of doing the project in terms of IT and business benefits and the associated impact on the enterprise.

“Prices for performance management tools may vary considerably, depending on the nature of the infrastructure component and the range of options being considered. For example, monitoring a simple file and print server may cost \$500, while monitoring a complex database server may cost tens of thousands of dollars. Most products will also add the cost of the base product (framework, database, console) to the base price. Some performance products will require a client agent on the desktop, which will cost between \$200 and \$500, depending on the complexity of the monitoring. In all, the software costs can quickly reach anywhere from several hundreds of thousands of dollars at the low end, to several million dollars at the high end.

“Hardware costs are also a factor. While most of the deployment is done on existing infrastructure elements, some elements may require upgrades in memory and storage. Agents do take their toll in terms of resource consumption, and while a global number is also difficult to provide, CPU usage may vary from 3 percent to 25 percent, depending on the complexity and number of the processes to be monitored. [Giga believes that BMC Perform and Predict agents consume CPU usage at the low end of this range, i.e., between 3 percent and 5 percent.]

“Products will also need dedicated resources for management application processing, and, depending on the size of the infrastructure, this may require several tiers of management servers and databases.

“Implementation cost factors follow the life cycle of the infrastructure management project. Costs are associated at each step — planning, training, design, deployment, operation and maintenance:

- **Planning:** ‘Well-prepared is halfway done,’ as the maxim goes. Planning is one of the most crucial elements of a successful implementation and it all has to take place before even deciding on a product. Inventory of assets, applications, revision levels, etc. are part of what should be known beforehand. Most infrastructure management products use agents, either provided by the device vendor or deployed with the management application. The knowledge of what’s out there is vital. Understanding which parameters to watch and their critical levels is key. Should a given process generate an alert at 90 percent CPU usage or at 50 percent? This information will be needed during deployment — and the deployment stage will not be a good time to go looking for the answer.
- **Training:** People will have to be trained in the management disciplines being implemented. The impact of the change brought upon them by the new infrastructure management process should not be neglected. New

roles and responsibilities have to be communicated and explained and documents prepared, even before a product is bought.

- **Design:** Many products have a built-in capability to run scripts or other corrective action to respond to a problem, which also have to be decided on and written before deployment.
- **Deployment:** Eventually, there is the painful task of applying the right parameters for all agents and implementing the right scripts.
- **Operation:** Here, several cost factors are present. Staffing is, of course, the all-important cost and is strongly dependent on the efficiency and effectiveness of the product. Efficiency will manifest itself in terms of product integration and its capability to capture all data and events on the infrastructure. Effectiveness will be a factor of the product root-cause analysis capability and problem resolution. For example, two products can be equally as efficient when it comes to the granularity of data provided, while one may be more effective in its analysis of the problem's root cause and allowing for faster corrective action. Automation of corrective actions and the limitations of staff intervention are also factors. When it comes to capacity planning, specific skill sets — mostly in statistics and analysis — may be difficult to find.
- **Maintenance:** This consists mainly of making necessary updates to the product(s), but also of the continuous adaptation to the evolution of the infrastructure. This, depending on the enterprise, may require a significant share of resources.

The Infrastructure Management Project

“A full infrastructure management project includes three basic functions (management of events at the infrastructure component level, performance management and capacity planning), which can be classified into real-time and non-real-time activities. In real-time activities, availability and performance management tend to maintain service levels by alerting users to potential faults in the current infrastructure, while non-real-time actions tend to forecast future problems and plan the infrastructure evolution needed to sustain service levels for the long run. Management data can then be classified into two domains: a qualitative domain including real-time availability and the alerting part of performance management and a quantitative domain, capacity planning.

A full performance management implementation scenario includes the following functions:

- **The real-time management of events taking place at the infrastructure component level, the determination of their cause and their impact on users:** Events can include device status, reports on a device condition or the fact that a monitored parameter threshold has been reached. The number of packets dropped on a port is an event if it goes beyond a certain level, as is the memory-low status of a router or the amount of CPU used by a process on a server. A slow response time at a geographic location, or from a specific process, are also events. All these events come to a console, operated in constant contact with a call center where users report problems. Typically, these events are filtered to reduce their number and analyzed to determine their cause. Once the cause has been determined, a corrective action will take place to re-establish normal operation. Products used here vary in effectiveness (the capability to capture many events) and in efficiency (the capability to provide rapid problem identification and corrective action, therefore reducing the potential downtime). Corrective actions vary from the ability to automatically correct a problem, sometimes before it actually impacts users, to the simple forwarding of an alert to a person. Root-cause analysis works on top of event management and provides a rapid, real-time identification of problems and their source.
- **Performance management, which has two important roles:** It collects quantitative data, monitors its values against predefined thresholds and generates alerts when thresholds are reached. The data is stored in a time-aligned fashion for further use: either the real-time understanding of performance problems (‘drill-down’ function) or the statistical capacity planning process. Performance management products may be of different natures: from desktop agents monitoring response times (active or passive agents), to agents monitoring hardware performance, through agents monitoring a specific process or database.

- **Capacity planning, the true quantitative domain:** Products are expected to provide significant time-aligned parameters in terms of performance as seen by the end user, workload applied to the infrastructure and resulting usage levels for all components. Trending and simulation are the two statistical functions that can be applied to the data collected to provide forecasting information.”

Costs, Benefit Savings, Flexibility and Risk With BMC Performance Assurance

Costs to Implement Performance Assurance Solutions

Each of the four organizations interviewed discovered that the initial cost to deploy BMC Software's Performance Assurance solutions is fairly high — although when considered in conjunction with short- and long-term benefits and flexibility, the four organizations agreed that BMC Software Performance Assurance solutions have value. However, identifying and quantifying the costs, cost savings, benefits, flexibility options and associated risks can be a difficult task.

The software acquisition and maintenance expenses of this project are the main cost factors here and a function of the number of nodes being managed. In addition, to take full advantage of the performance assurance features of Perform and Predict, our sample company added eight capacity planning personnel who were proficient in statistics and analysis. This additional cost was more than offset by the significant IT staff productivity improvements from the Automated Performance Reporting features in Perform and Predict.

In Table 2, Giga has identified the major costs categories associated with deploying BMC Patrol Performance Assurance software at our sample organization.

Table 2: Total Implementation Costs Over Three Years — Sample Organization

Expenses	Unadjusted	Risk-Adjusted
Pre-implementation planning costs	\$170,000	\$170,000
Perform and Predict software licenses — 2,000 servers	\$3,017,000	\$3,017,000
BMC SureStart professional services	\$400,000	\$400,000
Unix servers to host software	\$75,000	\$75,000
BMC training for Perform and Predict (initial and ongoing)	\$50,000	\$56,667
Annual maintenance (\$603,400 each for years 2 and 3)	\$1,206,800	\$1,206,800
Annual BMC HealthCheck professional services (\$50,000 for years 2 and 3)	\$100,000	\$130,000
8 incremental capacity planning administrators	\$1,665,000	\$1,748,250
Total implementation costs over three years *	\$6,683,800	\$6,803,717

Source: Giga Information Group

* Data in Table 2 is not adjusted for NPV (Net Present Value)

Our sample organization embarked on a three-month, preplanning process involving four IT and Capacity Planning staff who spent 50 percent of their time (\$170,000 in labor costs) understanding the inventory of assets, applications and revision levels. BMC software expenses were \$3,017,000 for Perform and Predict licenses on 2,000 distributed system servers, of which 800 were Unix and 1,200 were Windows NT. Other initial implementation costs included: BMC's SureStart professional services at a cost of \$400,000 (\$80,000 for each of the five major data centers; five two- or four-way Unix servers to host Perform and Predict at a cost of \$15,000 for each data center (\$75,000 total); and Basic and Advanced Perform and Predict training for two people per data center initially, followed by annual training totaling \$56,667, including travel expenses for BMC's instructor.

Maintenance expenses totaled \$1,206,800 (\$603,400 in years two and three), and BMC HealthCheck professional services totaled \$100,000 (\$50,000 for years two and three). These above costs have been incorporated into this study's ROI analysis and where applicable have been risk adjusted as indicated in Table 2. (For more on how TEI assesses risk, see Appendix B, and the "Risks Associated With Performance Assurance Solutions" section of this report.)

For the purposes of the sample organization, BMC's products and services are priced at a common volume discount off BMC Software's list price as of October 2002.

Each of the four customers Giga interviewed experienced the above costs categories, although three of the organizations used existing servers and did not have to purchase additional servers.

Our four interviewed customers discovered that Perform and Predict implementation costs are strongly dependent on infrastructure size (number of nodes) and the experience and capabilities of their capacity planning staffs. Pre-implementation planning costs were dependent on how well the infrastructure and process running on top of it were already known and documented. Training costs varied widely depending on the capacity planning skill set of existing IT staff.

During deployment of Perform and Predict software, if the correct parameters are understood and documented, setting up collection on a server may take anywhere from 10 to 30 minutes. Setting up reports, databases, consoles, etc. will consume deployment time in addition to the basic agent setup. Tuning the reports for different constituencies represents another cost. Average representations of these costs were included for our sample company and are represented in Table 2.

Benefit and Savings Opportunities From Implementing Performance Assurance Solutions

In its research and interviews, Giga identified the following key cost savings associated with a quality implementation of Perform and Predict solutions (see Table 3):

- Reduced IT labor/staffing costs associated with problem avoidance/resolution of performance management issues
 - IT productivity labor gains from Automated Performance Reporting
 - Acceleration of Performance Analysis and Issue Resolution
 - Performance planning for future requirements
- Better server capacity utilization (as measured by hardware capital cost deferral and avoidance)
 - Gain a better understanding of current server requirements and defer near-term server purchases by reallocating excess server capacity (buy later)
 - Establish server consolidation savings by eliminating servers and their associated licensing and maintenance costs
 - Reduce longer-term hardware costs through improved server life-cycle management by having newfound timing flexibility and vendor negotiation leverage (purchasing power) to attain the best possible pricing for server hardware (buy less)
- Savings for both transaction- and batch-oriented end users due to increased system availability and reliability and improved response times

Table 3: Total Benefits and Savings Over Three Years — Sample Organization

Expenses	Unadjusted	Risk-Adjusted
IT productivity labor gains from Automated Performance Reporting	\$4,427,083	\$4,205,729
Acceleration of Performance Analysis and Issue Resolution	\$183,894	\$159,375
Productivity savings — performance planning for future requirements	\$343,269	\$337,548
Savings due to server consolidation	\$1,697,403	\$1,640,823
Savings due to deferred hardware purchase price reductions	\$900,000	\$825,000
Savings due to hardware and software purchase deferral	\$570,000	\$522,500
Initial performance tuning — response time improvements	\$60,000	\$57,000
End-user savings due to increased system availability and reliability and improved response times	\$2,265,260	\$2,151,997
Total benefits and savings *	\$10,446,909	\$9,899,972

Source: Giga Information Group

* Data in Table 3 is not adjusted for NPV (Net Present Value)

The four customers interviewed experienced operational savings as a result of the qualitative management being implemented with Perform and Predict products. Three-year direct productivity savings of \$4,205,729 (risk-adjusted) were based on a resource reduction of IT staff being used to track and correct problems. Perform and Predict's Automated Performance Reporting significantly decreased the time needed to collect, process, predict and publish performance information. BMC Perform and Predict solutions allow for significant reductions in IT labor by allowing troubleshooting and drill-down capability and discovery of performance bottlenecks, thereby relieving IT staff intervention in the performance management processes.

Using Perform and Predict, our sample company and the companies we interviewed gained a better understanding of their current server capacity requirements, resulting in savings from server consolidation. Giga believes that while server consolidation is not a guaranteed method of reducing IT expenses, it can be beneficial for many organizations and is worth evaluating. Server consolidation is particularly useful for companies that are underutilizing capacity (i.e., using less than 30 percent to 40 percent of server capacity), companies that are consolidating data centers (due to downsizing, mergers and acquisitions, etc.) or companies that are experiencing server sprawl and manageability problems. Server consolidation can result in savings from the reduction of internal IT staffing and from reduced software license and maintenance costs. For our sample company, server consolidation reduced the number of the existing 2,000 servers by 9 percent per year (a 25 percent cumulative reduction over three years), saving \$1,640,823 (risk-adjusted) in server support costs. Giga estimates that overall server support costs are 21 percent of server hardware costs per year. In addition, server consolidation saved our sample company a risk-adjusted \$522,500 by postponing hardware and associated software purchases, and an additional \$825,000 in future, lower server prices. Our sample company was also able to be more proactive in vendor negotiations, resulting in these price reduction savings. In addition to server support cost savings, some organizations interviewed were able to reduce their facilities space allocated to servers. However, because these facilities-related costs are fixed in the short term, Giga did not include any savings in this analysis.

Cost Savings Related to Increased System Availability, Reliability and Response Times

While cost efficiencies within IT have traditionally created a sound business case for deploying PATROL Performance Assurance solutions, other positive benefits for the organization as a whole can also be measured. Each of the customers Giga interviewed credited the Perform and Predict solution with a reduction in disruption or unplanned response time degradations, resulting in improved system availability in terms of not only failure prevention but also faster problem resolution. This resulted in cost avoidance and savings opportunities of \$2,151,997 over three years (risk-adjusted) for the sample company due to higher levels of system availability, reliability and improved response times for critical customer service and revenue applications.

For the purposes of illustrating these cost savings opportunities relating to performance improvements, we will use one of the call centers from our sample company, which handles both sales calls and customer service inquiries.

At the sample organization, the call center plays a central role in customer relationships and sales generation. We will assume a quality of service level where 80 percent of calls are answered in less than 20 seconds, and no more than 10 percent of the calls go unanswered. The call center receives 500 calls in its busiest hour and the average call lasts 15 minutes, requires 15 transactions with multiple applications with an average response time of six seconds per transaction. Our sample organization used Perform and Predict to fine-tune the applications that improved system response time by four seconds — from six seconds to two seconds — resulting in this call center requiring eight fewer operators (141 vs. 149) and thereby driving significant annual savings of \$403,200 (based on an operator's base salary of \$36,000 and a fully loaded cost of \$50,400).

Other benefit opportunities mentioned by the four customers Giga interviewed that related to increased system availability, reliability and response times were:

- **Manufacturing impact:** This is the cost (avoidance) to restart a production line, as well as any products that are spoiled due to production interruption.
- **Lost business avoidance:** This is the average amount of permanently lost sales for the duration of outage. Most companies can use historical sales and customer retention data to estimate their loss, which is calculated by taking the total revenue per hour multiplied by the percentage of revenue that is lost forever, and not merely deferred until the system is running again.

Below are other cost avoidance opportunities that Giga believes are difficult to predict or value and therefore are not included in the ROI of Perform and Predict solutions:

- **Customers lost:** This is the number of customers lost to competitors as a result of outages, which will be a longer-term function of both frequency of outages and duration.
- **Customer service premiums:** This is the number of customers upset enough to complain (i.e., cost to make them happy). This can include discounts, free shipping, lunches or other promotions as well as future additional marketing costs.
- **Public relations impact:** What will it cost to repair the damage in the press?
- **Regulatory impact:** Is there a fine or penalty that will need to be paid?

Flexibility of Performance Assurance Solutions

Flexibility, as defined by TEI, represents investing in additional capacity or agility that can for some *future* additional investment be turned into business benefit. Giga believes organizations that invest in Performance Assurance tools create the additional capacity and agility to allow for more cost-effective deployments of future applications. This flexibility does not promise benefit during the initial implementation phase of the project and must be captured later as a future benefit. The existence of the option to capture these savings has a present value that can

be estimated. The flexibility component of TEI captures that value using the industry standard Black-Scholes options valuation formula.

Flexibility benefits will occur from a quality implementation of an infrastructure management system. Essentially, Perform and Predict enables IT flexibility and agility through *infrastructure knowledge*. Knowing how much capacity is required by a new application (or the extension of an existing one), along with the capabilities of the existing infrastructure, allows one to avoid the potentially costly exercise of “tuning up” application performance during early deployment and negatively impacting end-user productivity.

The quantitative component of a full performance management project is an enabler of flexibility, which would be mostly lacking in an implementation limited to a qualitative (event management) implementation. The existence of quantitative infrastructure management data provides a baseline of capacity usage for all components and, through the implementation of capacity planning, the understanding of the capacity requirements of any new or upgraded application. It becomes possible to forecast which components can be reused and which should be improved or added to. This results not only in an optimization of the existing infrastructure but also in the capability to acquire new components in the best possible negotiating conditions, including purchase price.

Although one could argue that the value of excess capacity is in fact a positive risk that promotes agility, this becomes a specious argument if the amount of excess capacity is unknown. Quite simply, if it's not measured, it does not exist. Agility, the capability to quickly redirect some of the existing infrastructure to new tasks or to more quickly implement new IT functions, is directly linked to the level of knowledge of the infrastructure capacity, used and available.

Each of the four organizations interviewed by Giga indicated it had plans to add new productivity and/or revenue applications to its computing environment. All four organizations indicated that with BMC Software Performance Assurance solutions, their computing environments were more flexible and agile, allowing them to quickly deploy new or upgrade existing software applications. Giga believes there is quantifiable value in having the flexibility and agility to deploy new software *faster*, thereby gaining the benefits earlier. Using BMC Software's Perform and Predict solutions, each interviewed company was able to determine if there was enough server capacity in its current infrastructure to support a new application or upgrade. Furthermore, this immediately available capacity will give the companies the “option” to accelerate the implementation of the application, which will take advantage of productivity and/or revenue benefits earlier. In our sample company, Giga values these flexibility options at a risk-adjusted \$303,006 over three years.

Risks Associated With Performance Assurance Solutions

Risk-adjusted and non-risk-adjusted ROI are both discussed in this study. The assessment of risks provides a range of possible outcomes, based on the risks associated with IT projects in general and specific risks related to PATROL Performance Assurance solutions.

In our research, Giga discovered that implementing PATROL Performance Assurance solutions was not without risk. As shown by past failure rates of performance management implementations, there is quite an important risk of failure. This should justify taking many precautions to mitigate risks, including extensive preparation and planning.

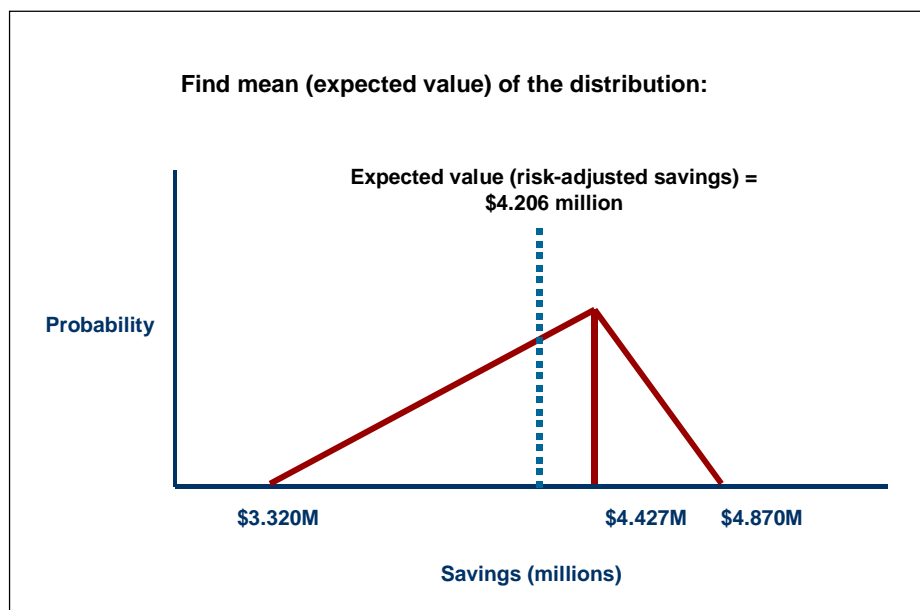
In addition, any discussion of risk must address the human nature of change. People and organizations tend to react negatively to change, and a project of this magnitude requires changes in process, organizational structure and ways of thinking. A skill set that was perfectly adequate for one level of management may not be the one needed for performance and capacity management. Significant internal selling, role and responsibility definitions and preparation are necessary for success.

Risks-to-benefits considers all possible risks to each benefit. Likewise, risks-to-costs considers all possible risks to each cost. Using probability density functions, we create a triangular distribution range of three values, including a low estimate, a most likely estimate and a high estimate. For example, in our sample organization, we included a risk adjustment for the benefit “IT productivity labor gains from Automated Performance Reporting,” which we valued at \$4.427 million (non-risk-adjusted). For this savings category, the risks-to-savings ranged from a low estimate of 75

percent of the \$4.427 million (\$3.320 million), suggesting an inability to realize 100 percent of the automated performance reporting savings, to a high of 110 percent (\$4.870 million), indicating a possible slight overachievement of the savings due to hiring and retaining experienced capacity planners. The 75 percent risk estimate considered the possibility of a learning curve delay in realizing the full benefits of Automated Performance Reporting as expected from the new Performance Assurance software.

Using triangular distribution, we sum the three possibilities of low, most likely and high and divide by three to get our mean (or risk-adjusted cost savings) of \$4.206 million ($\$3.320\text{M} + \$4.427\text{M} + \$4.870\text{M} = \$12.617\text{M} / 3 = \4.206M). Figure 1 illustrates the concept of triangular distribution, and the vertical line in the center represents the expected value of \$4.206 million. In our sample organization, costs for years two and three were adjusted for risk (see Tables 2 and 3). For year one, the BMC-quoted product and service costs (including years two and three maintenance) were not risk adjusted since they were viewed as fixed, guaranteed costs from BMC.

Figure 1: Risk Adjusting Productivity Labor Gains Cost Savings — Example



Source: Giga Information Group

The following *general* risks were considered in this report:

- Lack of corporate discipline in creating processes and procedures to best take advantage of performance management benefits
- Lack of appropriate training for IT personnel who will be responsible for optimizing the benefits from Performance Assurance solutions
- Failure to reduce, transfer or redeploy IT support headcount made redundant by implementing Performance Assurance tools
- Internal inertia, conflicting priorities and turnover, reducing the organization's ability to achieve the benefits

The following risks associated with PATROL Performance Assurance solutions were considered in this report:

- The inability of an organization to find, train and retain capacity planning staff who have the specific skill sets, mostly in statistics and analysis, to take full advantage of the benefits

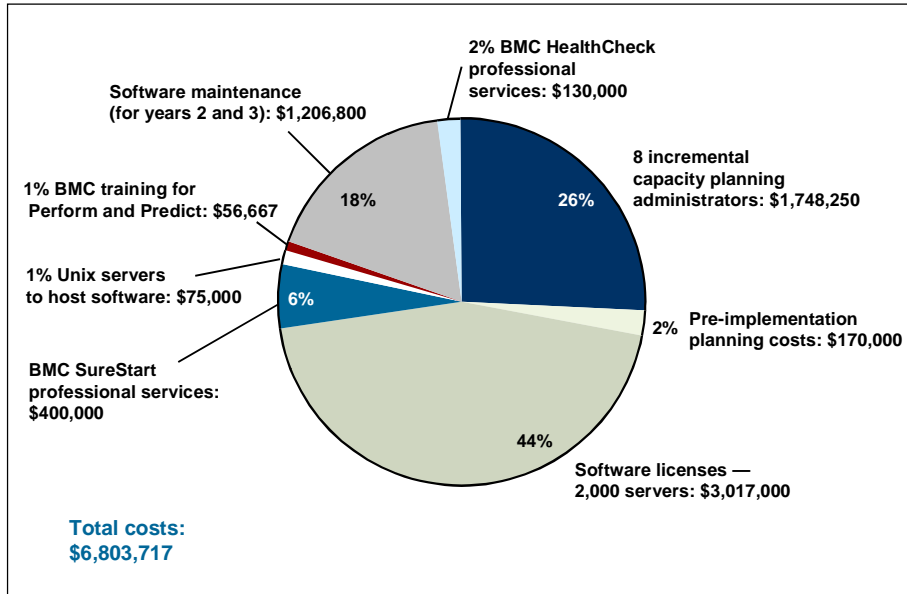
- The lack of adequate preplanning and well-thought-out requirements based on upfront research; mitigating this risk is critical to achieving the benefits of any performance management project
- The risk that people and organizations will react negatively to change, and a project of this magnitude requires changes in process, organizations and ways of thinking
- The risk that BMC Software will not upgrade subsequent versions with the latest Performance Assurance techniques that Performance Assurance competitors have subscribed to (although Giga believes that BMC's PATROL Perform and Predict product is currently the leader in server capacity planning and performance management)

This remains a moderate- to high-risk project, where the preparation time needed for ultimately successful implementations is strongly dependent on the knowledge of the installed infrastructure. Since this knowledge is precisely why the project is undertaken, this contradiction may necessitate a lot of tuning and trial-and-error before achieving 100 percent of the benefits. Organizations implementing any performance management software can expect time and effort to be more than anticipated, and time to success to take longer than anticipated. Giga has factored these appropriate risks into the ROI analysis of our sample company.

If a risk-adjusted ROI still demonstrates a compelling business case, that raises confidence that the investment is likely to succeed since the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as "realistic" expectations, since they represent the expected value considering risk. Assuming normal success at mitigating all risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

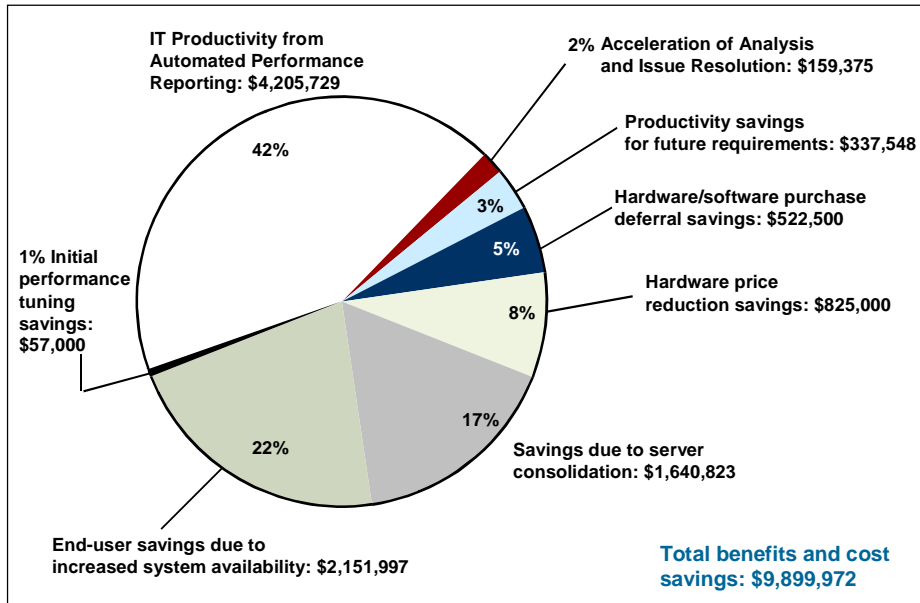
Costs, Benefits and Costs Savings — Sample Company

Figure 2: Three Years — Sample Company Costs (Risk-Adjusted)



Source: Giga Information Group

Figure 3: Three Years — Sample Company Benefits and Cost Savings (Risk-Adjusted)



Source: Giga Information Group

Summary

The magnitude of an infrastructure management project is such that a serious financial case should be presented before proceeding. Only a complete implementation, including qualitative and quantitative management, will yield an adequate level of potential benefits and provide flexibility. Benefits will come from savings at the IT operation level as well as business productivity improvements. Flexibility, or agility, will be enabled by the knowledge of the infrastructure usage and capacity, which opens the door to successful future application and infrastructure evolution.

Recommendations

The success of an infrastructure performance management project hinges on preparation and careful planning. Most of the work on requirements, management process, inventory of infrastructure and application and preparation for organizational change must be done in advance of implementation. A significant project like this requires justification, since the benefits of such a project will only be seen after implementation, which can take from six to 12 months before completion.

As the data in this study indicates, BMC Software's PATROL Performance Assurance solutions have the potential to provide a significant return on investment. In addition, the risk-adjusted ROI of 35 percent, along with a 19-month payback period, raises confidence that the investment is likely to succeed since the risks that may threaten the project have been taken into consideration and quantified. For most organizations, PATROL Performance Assurance product investments carry a moderate-to-high level of risk (mitigateable), a positive ROI and a reasonable amount of time to recoup the investment.

Appendix A: Sample Organization

Description of Sample Organization

Our sample organization is a global financial institution with five major data centers and 400 remote branch offices. It has about 5,000 distributed system servers, of which it plans to apply performance management tools to 2,000 servers (approximately 400 per data center). These specific servers support applications that are predominately client/server and include firewalls, gateways, Web servers, RDBMSes and application middleware.

Our sample organization is one year into its post-merger phase and, as a result of the merger, there is high redundancy in systems and applications. Its near-term challenge is to identify what applications are running where. It believes there is a minimum of 10 percent outright redundancy in applications (not to mention considerable opportunity for migration to common applications), and at least 15 percent of the current managed servers are significantly underutilized at less than 5 percent for most of the day.

The company has a significant number of mainframe, AS400 and OpenVMS applications as the result of past merger and acquisition activity. However, at this time they need to get control of the distributed system environment.

Prior to implementing PATROL Perform and Predict solutions, the sample organization had several strategic goals and objectives it was trying to achieve by implementing a performance management solution:

- Reduce IT hardware costs
- Enable system performance to be viewed and measured in business terms by improving system availability and response times for critical productivity and revenue applications
- Enhance the ability to identify, troubleshoot and diagnose abnormal behavior in the systems, applications and users' environment
- Reduce performance risk

The organization has approximately \$50 million budgeted annually for information technology. This budget has to cover technology refresh to replace aging and legacy systems, keep pace technically with competition and introduce new competitive services.

Vendor Pricing Assumptions for Sample Organization

Here are the major vendor cost components attributed to our sample organization:

- BMC Perform and Predict licenses on 2,000 distributed system servers ranging from E15k to NT Web servers (approximately 800 Unix and 1,200 NT servers) = **\$3,017,000**
- Maintenance: 20 percent after first year = **\$1,206,800** (\$603,400 per years two and three in this three-year ROI analysis)
- Initial basic and advanced Perform and Predict training: Two people trained per data center. On-site customer classes for two weeks = **\$30,000** (including travel expenses for instructor)
- Annual training after first year: Professional development, staff turnover or refresher = **\$20,000** (\$10,000 per year)
- BMC professional SureStart services for initial implementation, custom report and workload characterization, process establishment, and knowledge transfer = **\$400,000** (\$80,000 for each of five data centers)
- BMC Professional HealthCheck services = **\$100,000** (\$10,000 per data center, per years two and three)

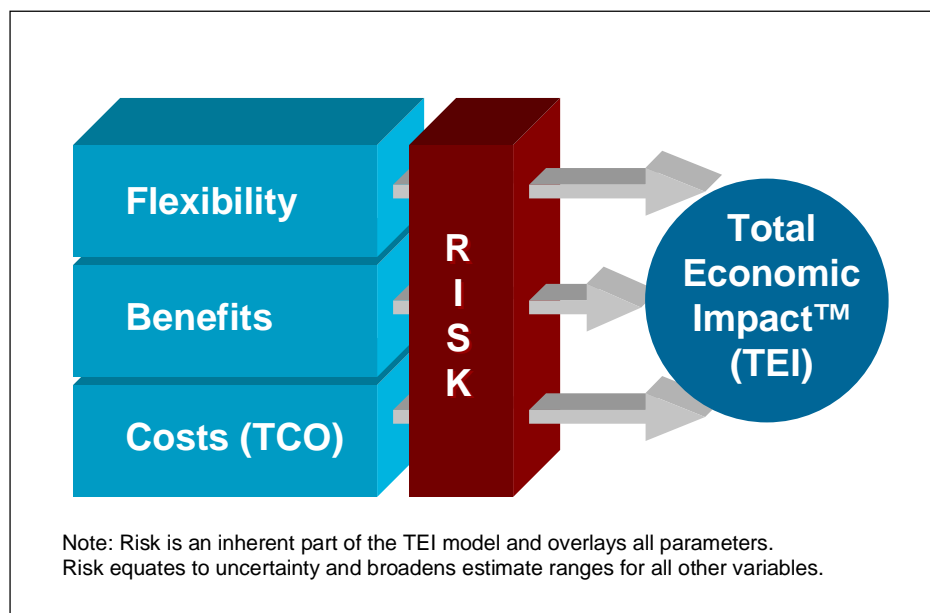
Appendix B: Total Economic Impact™ Primer

Total Economic Impact™ is primarily a common language tool, designed to capture and properly communicate the value of IT initiatives in a common business language. In so doing, TEI considers four elements of any initiative:

1. Benefits
2. Costs (sometimes referred to as total cost of ownership (TCO))
3. Flexibility
4. Risk

Figure 4 shows the TEI methodology conceptually. Benefits, flexibility and costs are considered, through the filter of risk assessment, in determining an expected ROI for any given initiative.

Figure 4: TEI Conceptual Diagram



Source: Giga Information Group

Benefits

Benefits represent the *value* delivered to the business by the proposed project. Oftentimes, IT project justification exercises focus on cost (e.g., TCO) and cost reductions. Among industry leaders, IT is deployed as an offensive weapon, with value expectations greater than simple cost reduction, especially when those cost reductions tend to focus within IT. TEI captures the value proposition of the proposed project by measuring the benefits against the incurred costs.

All benefits captured by TEI must be traceable back to one or more critical success factors (CSFs). These CSFs are directly linked to a higher-level business strategy. If a proposed technology investment generates benefits that cannot be satisfactorily linked to a CSF, it will not be included as a benefit for the organization in the model. In these cases, TEI requires that the benefit be discarded.

Under TEI, benefits may only accrue to the business units. “Benefits” derived through cost reductions within IT accrue as negative TCO to the IT budget, thereby showing a reduced TCO. (TCO is considered by TEI to be a single-dimension, cost-centric focus on the IT budget.)

The TEI process begins with a discovery of potential benefit areas. A representative from the organization under examination, who has the ability to capture the benefit in question, must validate each benefit captured during discovery. In other words, values cannot be arbitrarily assigned to a benefit if that person is not in a position to deliver that benefit should the project be approved. Additionally, projects that are expected to deliver business value require some effort on the part of the business to realize that value. That effort may be in the form of training, organizational change or a modification of extant business processes. Therefore, TEI requires dialog with the business leaders actually responsible for making the necessary changes, in order to capture the proposed benefit during the justification phase. TEI captures this dialog in the form of the names of the individuals, which validates the value calculation of each benefit.

Within TEI, each benefit entered has a specific capture date. Although the benefit may be captured over time, TEI requires the specification of a date when most of the benefit has been captured. TEI will then place the value delivered in the appropriate time frame within the project.

Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs. These may be in the form of fully burdened labor, subcontractors or materials. Additionally, costs consider all the investment and expenses necessary to deliver the value proposed.

Flexibility

Flexibility, as defined by TEI, represents investing in additional capacity that can, for some future additional investment, be turned into business benefit; for instance, an investment in an enterprise wide upgrade of the desktop word processor application where the primary driver may be standardization (to increase efficiency) and licensing (to decrease IT costs). However, a collaborative workgroup feature may translate into greater worker productivity when the organization is ready to absorb the discipline necessary to capture that benefit. The collaboration feature does not promise benefit during this phase of the project and must be captured later, incorporating additional investment, most likely in the form of training. However, the existence of the option has a present value that can be estimated. The flexibility component of TEI captures that value.

Flexibility can also be calculated by acknowledging that management has several decision points along the way for any given project. At each point, management can steer the project to a different outcome or cancel it altogether. Many NPV evaluations fail to take this *management flexibility* into account. Since TEI's flexibility component uses the industry standard Black-Scholes options formula, the management flexibility factor is taken into consideration.

TEI divides a project into multiple phases. The first phase is considered the "benefits" phase — it is the phase expected to deliver the primary benefits. The benefits phase is usually no more than one budget cycle long, and it is the primary reason the project is being considered. All other phases are "options" or "flexibility" phases. For additional investment at some point in the future, business benefit can be captured during these "options" phases. TEI applies the Black-Scholes options pricing equation to all phases other than the benefits phase. The Black-Scholes equation uses five inputs to calculate the present-day value of flexibility or options:

1. The value, or business benefit, that can be captured when the option is exercised; this value is expressed in present value terms
2. The time, to the date, at which point the option or flexibility expires; expiration could be due to business changes or technology obsolescence
3. The cost of the investment to exercise the option and capture benefit
4. The risk-free interest rate (typically, the interest rate of government securities is used)
5. The volatility of the industry or sector; TEI uses the volatility of the stock prices within the market sector as this input

Risk

Risks are used to widen the possible outcomes of the project. Since the future cannot be accurately predicted, there is risk inherent in any project. TEI captures risk in the form of risks-to-benefits and risks-to-costs.

Risks-to-benefits considers all possible risks to each possible benefit. Likewise, risks-to-costs considers all possible risks to each possible cost. Then, a range is chosen by applying best judgment for each cost and benefit, based on the set of risks assigned to each cost and benefit. The range is entered in the form of a low estimate, a most likely value and a high estimate. For example, the risks to a cost may result in a range, from the expected value as the low estimate to two times the expected value as the high for a particular cost (representing a potential two times cost overrun).

TEI applies a probability density function known as “triangular distribution” to the values entered. The expected value — the mean of the distribution — is used as the risk-adjusted cost or benefit number. The risk-adjusted costs and benefits are then summed to yield a complete risk-adjusted summary and ROI.

Typical project risk factors to consider include the following:

- **Vendors:** The risk that the vendor of a product or technology may need to be replaced at some point during the project duration
- **Products:** The risk that a product will not deliver the functionality expected
- **Architecture:** The risk that the current product architecture will not allow future infrastructure decisions and changes
- **Culture:** The risk that an organization will be unable to absorb the new technology or adapt to its implementation
- **Delays:** The impact on revenues of a project delay or cancellation
- **Size:** The direct correlation of project risk to the size of the project, as measured by application size or budget