

# Forrester Consulting

HELPING BUSINESS THRIVE ON TECHNOLOGY CHANGE

*Prepared for Sun Microsystems*

July 2, 2004

## **The Total Economic Impact™ of Sun Microsystems' Enterprise Consolidation Solutions**

**Project Directors:**

**Bob Cormier, Senior Consulting Advisor, TEI  
Richard Fichera, Vice President**

FORRESTER®

FORRESTER®

**Headquarters**

Forrester Research, Inc., 400 Technology Square, Cambridge, MA 02139 USA  
Tel: +1 617/613-6000 • Fax: +1 617/613-5000 • [www.forrester.com](http://www.forrester.com)

## **Table Of Contents**

|  |    |
|--|----|
| Introduction.....                                      | 3  |
| Sun Enterprise Consolidation Solutions.....            | 4  |
| Sun's Overall Consolidation Offering .....             | 5  |
| Sun's Consolidation Methodology .....                  | 5  |
| Forrester's Assessment .....                           | 8  |
| Anonymous' Challenges, Goals, and Objectives.....      | 8  |
| Using Sun's Enterprise Consolidation Methodology ..... | 9  |
| Costs And Benefit Savings .....                        | 10 |
| Risks.....   | 11 |
| Flexibility Options .....                              | 11 |
| Summary.....   | 12 |

© 2004 Forrester Research, Inc. Circulation or disclosure in whole or in part of this report outside the authorized recipient organization is expressly forbidden without the prior written permission of Forrester Research, Inc. Forrester, Forrester Oval Program, Forrester Wave, ForrTel, WholeView 2, Technographics, TechRankings, Total Economic Impact, and TEI are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies. Information is based on best available resources. Opinions reflect judgment at the time and are subject to change.

## Introduction

In January 2004, Forrester Research, Inc. commenced work on an enterprise consolidation research project commissioned by Sun Microsystems that focused on examining the potential return on investment (ROI) organizations might realize by adopting Sun's Enterprise Consolidation solutions.

This study focuses on the benefits and costs experienced by one of Sun's customers that deployed its products using Sun's Enterprise Consolidation methodology. This customer has chosen to remain anonymous, although Forrester's specific findings in this study are in large part based on interviews conducted with representatives of this organization. The study examines the estimated ROI and represents the findings derived from the customer interview and analysis process, as well as Forrester's independent research.

Anonymous, Inc. is an integrated communications provider offering broadband services, including advanced voice and video and enhanced data and communications management services to medium-sized and large businesses in more than 20 US markets. The table below represents a summary of the ROI that *Anonymous* projects to achieve during a three-year period by deploying Sun's Enterprise Consolidation products and methodology.

### Summary Financial Results — Anonymous

| Summary Financial Results                                   | Unadjusted (Best Case) | Risk-Adjusted |
|---|------------------------|---------------|
| ROI   | 83%                    | 71%           |
| Total three-year costs (NPV)                                | (\$1,068,744)          | (\$1,068,744) |
| Total three-year cost savings and flexibility options (NPV) | \$1,960,367            | \$1,829,952   |
| Total three-year net savings (NPV)                          | \$891,623              | \$761,209     |

Source: Forrester Research, Inc.

Sun selected Forrester for this project because of its 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. The four fundamental elements of TEI employed in modeling the ROI of Sun's Enterprise consolidation solutions are:

1. Cost and cost reduction
2. Benefits to the entire organization
3. Flexibility
4. Risk

Given the increasing sophistication that enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves an extremely useful purpose by providing a complete picture of the total economic impact of purchase decisions.

Forrester discloses the following:

- The study is commissioned by Sun and delivered by the Forrester Consulting group.
- Sun reviewed and provided feedback to Forrester, but Forrester maintained editorial control over the study and its findings and did not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- The customer names for the interviews were provided by Sun.
- Forrester makes no assumptions regarding the potential return on investment that other organizations will receive within their own environment. Forrester strongly advises readers use their own estimates within the framework provided in this study to determine the appropriateness of an investment in Sun products.

## Sun Enterprise Consolidation Solutions

Based on our research and interviews, Forrester found Sun's consolidation methodology to be a sound set of business and technically oriented processes designed to deliver incremental value to clients in a progressive manner — from initial feasibility and technical architecture design, through application and business architecture, and actual implementation either directly or through partners.

Each type of consolidation delivers its own benefits, typically with a rolling nine- to 12-month payback period. Taken together, the benefits of the different types of consolidation projects build on each other. Users can proceed at their own pace, starting with the simplest projects, such as device and platform consolidation, then move to application architecture and business architecture consolidation projects. The compelling attraction of a structured methodology such as this is that users begin realizing value in the early stages and can make incremental decisions about later stages without feeling compelled to commit to a “grand design” project in order to get any benefits.

The various types of consolidation efforts include:

- **Systems and infrastructure consolidation:** Types of systems and infrastructure consolidation include server and data center consolidation, network consolidation, workload consolidation, and storage consolidation. Within each of these categories there are many nuances of approach, but all are characterized by an attempt to lower operating costs by reducing the number of managed elements, simplifying management, and minimizing the overall complexity of the environment.
- **Application architectural consolidation:** Types of application architecture consolidation include database consolidation, application consolidation, and interface consolidation, as well as selective rearchitecting of entire applications.
- **Business architecture and consolidation:** The pinnacle of the consolidation chain involves the joint engineering of business process and technology for optimum impact and cost reduction. It is obviously the most time-consuming and expensive part of the consolidation, but for those enterprises with the discipline and desire, it can yield fundamental changes in the way that technology is brought to bear on business processes. It is important to remember that this is the final stage of a multistage effort, and customers are almost never advised to start here; rather, this is the point at which efficiencies that cannot be gained by the earlier methods are realized.

## **Sun's Overall Consolidation Offering**

While the focus of this paper is on Sun's consolidation methodology, the services component of Sun's consolidation offerings, there are additional components to Sun's overall consolidation program, including:

- **iForce Centers** — For consolidation, it is critical to test how applications react when they are combined with other applications on a single server. Sometimes there are issues, sometimes there are not. iForce Centers can be used to do proof-of-concept testing for consolidation, ensuring that the applications customers are planning to put together in the same O/S environment are friendly to each other.
- **Datacenter Reference Architecture** — The Datacenter Reference Architecture is a preconfigured IT environment for hosting applications. The servers, storage, tape libraries, network and Solaris are preconfigured. This preconfigured environment can then be customized to a particular customer's needs. Often, 80% of the solution does not change; the customer will likely only need to change 20% of the configuration. This reduces time to solution and professional service costs, and improves quality. This can be done at an iForce Center or on the customer's premises as the project dictates. Forrester believes that reference architectures help customers standardize their environment, thus improving quality and increasing manageability and reliability.
- **Technology** — Selective Sun technologies for consolidation can help customers reduce cost. Technologies like N1 Grid Containers, Solaris Containers, Dynamic System Domains, QFS file system and SAM-FS Hierarchical file system are technologies that help customers achieve their consolidation business goals.
- **Products** — Sun Fire servers, StorEdge storage devices and Sun's software (Solaris and middleware stack, JDS) are ideal for consolidation customers.
- **Financing** — Sun offers a number of different financing options to help customers with consolidation, including leasing programs, leasing programs with deferred payments, leasing programs with built-in technology refresh, COD programs, utility computing programs, and trade-in, upgrade programs.

## **Sun's Consolidation Methodology**

Sun's formal consolidation methodology has been in use and refined on projects since 1996 and is based on the conceptual life-cycle model of assess, architect, implement, and manage. The engagements are usually front-ended by an overall business and technical assessment: Justifying the overall business agenda and goals, success criteria (factors that Forrester has identified many times as being critical to the success of such projects), and technical aspects of the target environment, and a rough-cut assessment of possible costs and ROI.

The detailed phases of the methodology include:

- Sun Enterprise Consolidation Workshop
- Sun Enterprise Consolidation Justification Review
- Sun Enterprise Consolidation Architecture Service

- Sun Enterprise Consolidation Management Service

### **Enterprise Consolidation Workshop**

The workshop is a two-day working session to address the customer's high-level issues and requirements and is intended to be a session to gather customer's requirement for their solution.

The workshop is designed to help the customer understand Sun's architectural vision and to provide them with a road map for getting there. Sun consultants meet with the customer to understand the state of their architectural efforts and to identify actionable next steps. Recommendations are based on the methodology, which emphasizes the importance of building architectures with service-level requirements such as reliability, availability, scalability, and security. Information on the current architecture and inventory are gathered to provide input into a high-level cost analysis.

The output of the Sun Enterprise Consolidation Workshop is an initial high-level business case that documents the assumptions made, the areas of risk, and the areas needing investigation in order to improve accuracy.

### **Enterprise Consolidation Justification Review**

This is a more in-depth justification and cost analysis than is offered in the two-day Sun Enterprise Consolidation Workshop. The focus is to assist customers in determining whether consolidation of their IT environment will deliver solid business benefits, as well as to quantify that improvement in financial terms such as ROI and return on assets (ROA). Areas of potential risk are identified, helping to reduce the overall cost of developing a new technology solution.

Sun identifies target servers and storage systems for consolidation, defines success factors, identifies potential cost improvements and business advantages, and develops a preliminary cost/ROI report and solution proposal for the customer. Interviews may continue in the workshop format with key IT staff responsible for maintaining the current environment and business managers responsible for platform/infrastructure initiatives.

### **Sun Enterprise Consolidation Architecture Service**

The focus of the architect phase is to begin planning and building the architectural foundation of the customer's enterprise consolidation solution.

This service is intended to define the architecture and configuration plan for the consolidation solution. Sun consultants use the results of the existing architecture and operations assessment as a basis for defining the new consolidation architecture for systems, network, and storage. Sun works with the customer and develops a detailed design plan that itemizes and prioritizes specific actions your customer should take to build a fundamentally sound, standards-based framework for its IT organization. As part of the design process, the finished plan presents key IT strategies, policies and practices; metrics and methodologies drawn from industry-leading practices; and a migration plan.

For customers desiring an additional level of assurance prior to deployment, the iForce Ready Centers are available for Proof of Concept (POC) deployment of Reference Architectures with all lab facilities, hardware, and software provided by Sun and its partners. Sun Reference Architectures deliver key proof points and complete integration of Sun and third-party products

into a tested, documented Sun Business Ready Infrastructure architecture. Sun Reference Architectures provide an architectural overview, implementation guide, and sizing guide for specific product or solution deployments. The customer is provided a higher level of assurance prior to purchase and deployment since the configurations have already been tested in a lab at Sun and system sizing information is readily available.

The implementation phase activity focuses on the deployment of the chosen architecture into the customer's data center environment. Once the architecture has been defined, and agreed to, the implementation utilizes Sun services like the CRS (Customer Ready Systems). The Sun CRS program is a delivery mechanism that simplifies and speeds deployment of Sun and third-party products. The Sun CRS program offers customers flexible factory integration capabilities and a wide range of services that deliver enhanced reliability, reduced risk, and lower total cost of ownership.

### **Sun Implementation Service**

In the implementation phase, Sun actually implements the target consolidation architecture with a combination of its own and customer resources. Sun will selectively draw on multiple internal resources, and will use the appropriate combination of customized designs and modifications of its predefined reference architectures.

### **Sun Enterprise Consolidation Management Service**

Once the new consolidated environment is running, it needs to be managed, and Sun regards the design of the management environment as an integral part of the consolidation project, regardless of who actually ends up managing it in the end. A proper management environment includes both reactive (respond to problems) and proactive (monitor and predict failures) monitoring, along with the basic device and application management functions and update/patch capabilities.

Sun's policies regarding the management of the final environment are flexible, and the resulting management environment may be exclusively the customer's own personnel, an outsourcing partner, Sun, or a combination of any/all of these teams.

The management environment includes some or all of the following:

- Infrastructure optimization
- Site operation and support from Sun Managed Services
- Availability and security assessment and management
- Performance analysis, capacity management and planning
- Data center learning solutions including ongoing skills analysis and employee development planning
- Utility computing options
- Customized service models

## **Forrester's Assessment**

There are many models for infrastructure, application, and business process optimization, and while Sun's is a sound model, it is not so much the model itself but the organizational support behind it that drives its value. The fundamentals of Sun's engagement model represent a very pragmatic approach supported by accumulated corporate knowledge of how business-critical infrastructures are built and a detailed understanding of the real costs underlying both their operation as well as their acquisition.

The core value of any professional services engagement model, especially for vendors such as Sun that have long-term strategic relationships with their customers, is that it must be a consistent, longitudinal win for all parties. Judged by this measure, Sun succeeds. It is important to note that success in delivering value to customers does not in any way imply vendor neutrality, nor is it necessarily required. Sun makes no pretense of being vendor neutral — it is unabashedly applying its expertise to an infrastructure that is predominately Sun technology, but within this model, based on feedback we have received from its clients, Sun appears to make an honest effort to balance acquisition and ongoing management costs to deliver high-value systems to its customers.

Sun's reference architectures are worth noting, inasmuch as Sun's reference architecture program appears to be the best documented and developed reference architecture program in the industry, with a comprehensive set of documents, sizing tools, and customer-ready system configuration tools available for a wide range of application scenarios.

Based both on the data we collected during this particular project and on anecdotal comments from Sun users over many years, we would not hesitate to recommend Sun's consolidation methodology to any client with a commitment to a Sun infrastructure.

## **Anonymous' Challenges, Goals, and Objectives**

One of Sun's customers that deployed its products using portions of Sun's Enterprise Consolidation methodology is Anonymous, Inc. During the last four years, Anonymous grew its data center to more than 20 Sun servers supporting a variety of employee and customer applications. Oracle is used for all applications that require a database, including its mission-critical billing and operational support applications. Prior to consolidation these key applications were running at full capacity on three Sun Enterprise 6500 servers and a Sun Enterprise 450 server with the Oracle8i Database. Its success depended to a large extent on the ability to acquire the capacity to take on additional customers; prior to consolidation it took almost 24 hours to process a day's worth of customer bills.

A Sun customer since the company's inception four years ago, Anonymous purchased a SunFire 12K server in the summer of 2002 and has since consolidated four existing Sun servers and installed Oracle Financials, Billing and OSS (operational support applications) into separate domains. It has since upgraded to the Oracle9i Database and Oracle Financials.

Anonymous migrated from three Sun Enterprise 6500 servers plus an Enterprise 450 server to a SunFire 12K server plus two Enterprise V480 servers. The new SunFire server had enough built-in redundancy that Anonymous felt comfortable choosing SunSpectrum Gold level of service instead of the premium SunSpectrum Platinum service it had previously secured on the replaced servers. Anonymous found that having one SunFire server on SunSpectrum Gold service is less

expensive than having four servers on SunSpectrum Platinum service. The end result was significantly more performance at the same cost.

Anonymous feels its new scaleable IT infrastructure has been key to the company's successful explosive growth. In the near future (and not part of this financial analysis) Anonymous will be adding further capacity in the form of another SunFire 20K server for further consolidation of eight more Sun servers in its testing environment, plus failover capacity for its three production domains (Oracle Financials, Billing and OSS applications) currently residing on the existing SunFire 12K.

Anonymous, Inc. indicated it had the following challenges and issues prior to taking advantage of Sun Enterprise Consolidation solutions:

- Highly successful business conditions forced the company to re-examine its IT infrastructure
- Customer base is growing by 50% a year, and the demand on its billing system was growing exponentially as related to the customer base
- Needed to expand capacity in a way that would make scalability easier for continued growth
- Wanted to save IT-related costs
- Data center floor space was at a premium and Anonymous wanted a solution that would reduce the footprint in its data center, thereby contributing to a delay in data center expansion

## Using Sun's Enterprise Consolidation Methodology

Already a Sun hardware customer, Anonymous started its initial planning efforts with Sun in early 2002 as follows:

1. An initial assessment between Anonymous and Sun to collect high-level data for a potential engagement. Sun's output from this was a high-level assessment of whether the engagement has potential for substantial customer savings, and a high-level identification of the major areas for further analysis.
2. Sun submitted a consolidation design and proposal after a multi-day engagement requiring participation from Sun's senior consulting talent. The result of this process is a detailed proposal for a consolidation project and a cost model detailing the proposed savings.
3. The actual consolidation project was a joint effort with Sun providing installation, sizing, and tuning assistance. Anonymous was able to do most of the application migration, which consisted of transferring file systems and testing. No software changes were needed, although there were some changes to scripts.
4. Sun conducted a "train the trainer" exercise with Sun transferring needed knowledge to Anonymous' staff.

Anonymous had the following long-term goals and objectives after its initial assessment using Sun Enterprise Consolidation methodology:

- Take advantage of the scalability of its existing Sun and Oracle architecture to meet future growth demands
- Achieve the capacity to take on additional customers and grow revenues
- Significantly increase performance at existing cost levels

## Costs And Benefit Savings

Anonymous made a significant initial investment in new hardware in support of its consolidation goals, as follows.

In mid-2002 Anonymous leased the Sun (and EMC enterprise storage) solution through SunFinance and the total cost for the following hardware was \$1,113,000:

- SunFire 12K server (includes three years of SunSpectrum Gold support)
- (2) Sun V480 Servers (includes three years of SunSpectrum Gold support)
- Sun local storage hardware
- EMC Enterprise Storage
- Upgraded its SunFire 12K system boards (later in mid-2003)

Note on pricing: The financial results in this study assume Anonymous purchased and deployed Sun and other vendors' products/services at a normal discount off of list price. Other organizations may incur different prices; therefore, we make no assumptions that other organizations will achieve results similar to those cited in this report.

Anonymous reports and predicts the following **benefits** related to its consolidation efforts:

Anonymous' business is in significant growth mode which requires an IT infrastructure that can handle surges in demand for its services. According to Anonymous, while it was completing its server consolidation, it unexpectedly won the business of a large, new customer. Without the extra capacity and performance from the SunFire 12K server it would not have been able to support the billing demands of this new opportunity.

Anonymous also reports that its overall billing process is back under control because of the extra capacity and performance of the SunFire 12K, allowing Anonymous to perform billing on a daily basis instead of weekly. Anonymous states that for every day's delay in billing it cost them \$14,000, or a one-time benefit of \$70,000 for the first week of accelerated billing.

Anonymous reports a significant performance improvement with the SunFire 12K, and in conjunction with the benefits of dynamic resource allocation, the overall performance improvement (over the preconsolidated environment) is about 150%. This benefit is best measured by calculating the cost of Anonymous' next best alternative, which was to not consolidate. Instead of purchasing the SunFire 12K for consolidation, it could have continued to

replenish and incrementally add mid-level servers to its current environment. By purchasing the SunFire 12K server, Anonymous avoided replacing the three Sun Enterprise 6500 servers and the Enterprise 450 server in their normal life cycle, saving approximately \$165,000 annually. In addition, to support its significant growth rate, Anonymous would have to add two mid-level servers in year one, three servers in year two, and four in year three (of our three-year financial analysis), saving another \$1,485,000 over three years (including hardware, licenses and support costs).

It also reported a significant savings on Sun maintenance contracts. Having one SunFire server on SunSpectrum Gold service is less expensive than having four servers on SunSpectrum Platinum service. The end result was significantly more performance at the same cost.

Data center floor space was at a premium for Anonymous' growing environment and the SunFire 12K took up 35% of the space of the four servers it replaced. Although there are no cash savings associated with this benefit, it contributes to allowing Anonymous to delay a costly data center expansion in the future. There were also minor savings in power consumption, HVAC requirements, and cabling.

Anonymous spoke highly of the quality of Sun's support staff — for example, it called on Sun consultants to do some performance tuning on one of its servers. Sun's support staff identified the deficiencies in the configuration, explained the situation, and counseled Anonymous' IT staff as to how to fix the problem if it occurred again in the future.

As a minor offset to these benefits, Anonymous reported increases in software licensing costs from Oracle and VERITAS based on its new Sun server configuration. These offset some of the savings from the migration, however Anonymous was unable to quantify the additional costs.

## **Risks**

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 relative to Sun's enterprise consolidation products and methodology. In our research, we discovered that data center consolidation using Sun products was a relatively low to moderate risk endeavor if done in phases using Sun's consolidation methodology.

Anonymous could not identify any technical risks associated with a Sun enterprise consolidation implementation. Our interviewee at Anonymous supported Sun's future technical and marketing direction for its enterprise consolidation solutions.

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting ROI) associated with a 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.

## **Flexibility Options**

Flexibility, as defined by TEI, represents investing in capacity or agility that can be turned into business benefit for some *future* additional investment. We believe organizations that invest in Sun's Enterprise consolidation solutions may create the additional capacity and agility to allow for *faster and more beneficial* deployments of future applications.

Anonymous believes using Sun's Enterprise consolidation solution allows its computing environment to be more flexible and agile, enabling it to more quickly deploy future software

applications. Forrester believes there is quantifiable value in having the flexibility to deploy new software *faster*, giving Anonymous the option to *accelerate* the implementation of the new application, to take advantage of productivity and/or revenue benefits earlier. For Anonymous, we value these flexibility options at a risk adjusted \$251,440 using the Black-Scholes options pricing model.

## Summary

Based on our in-depth discussions with Anonymous, Forrester projects that its three-year ROI in Sun's enterprise consolidation products will be a risk-adjusted **71%** (**83%** non risk-adjusted). The three-year NPV of savings is **\$761,209** (risk-adjusted) and **\$891,623** (non risk-adjusted).

If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that Anonymous' 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 the risks, the risk-adjusted numbers should more closely reflect the expected outcome of Anonymous' investment.