

Forrester Consulting

HELPING BUSINESS THRIVE ON TECHNOLOGY CHANGE

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

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Table Of Contents

| | |
|---|----|
| Introduction | 3 |
| Sun Enterprise Consolidation Solutions | 4 |
| Sun's Overall Consolidation Offering | 5 |
| Sun's Consolidation Methodology | 5 |
| Enterprise Consolidation Workshop | 6 |
| Enterprise Consolidation Justification Review | 6 |
| Sun Enterprise Consolidation Architecture Service | 6 |
| Sun Implementation Service | 7 |
| Sun Enterprise Consolidation Management Service | 8 |
| Forrester's Assessment | 8 |
| Anonymous' Challenges, Goals, And Objectives | 9 |
| Using Sun's Enterprise Consolidation Methodology | 10 |
| Costs And Benefit Savings | 11 |
| Risks | 12 |
| Flexibility Options | 12 |
| Summary | 13 |

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Introduction

In January 2004, Forrester Research, Inc. commenced work on an enterprise consolidation research project commissioned by Sun Microsystems 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, LLP is a large US-based law firm bringing legal, economic, and financial expertise to clients around the globe. Table 1 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.

Table 1: Summary Financial Results — Anonymous

| Summary Financial Results | Unadjusted (Best Case) | Risk-Adjusted |
|---|------------------------|---------------|
| ROI | 144% | 129% |
| Total three-year costs (NPV) | (\$3,382,499) | (\$3,382,499) |
| Total three-year cost savings and flexibility options (NPV) | \$8,252,721 | \$7,750,580 |
| Total three-year net savings (NPV) | \$4,870,221 | \$4,368,080 |

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 that readers should 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. Anonymous is a large US-based law firm with a global reach. The 500 lawyers and staff at Anonymous spend thousands of hours preparing for their client meetings and courtroom appearances. Their success depends to a large extent on the consistent and prompt availability of reliable documents.

Prior to consolidation, Anonymous' documents were distributed across 170 Microsoft Windows servers and four direct-attached HP storage systems and departmental storage area networks (SANs) in 11 locations throughout the world. Its IT environment was growing increasingly difficult and expensive to maintain.

Anonymous envisioned creating a central document archive, which would do the following: 1) improve information accessibility, 2) reduce hardware costs, 3) foster greater success and productivity among its legal staff, and 4) reduce the burden on the IT organization. Anonymous indicated it had the following challenges and issues prior to taking advantage of Sun Enterprise Consolidation solutions:

- It had a complex, decentralized, and stressed network.
- There was a proliferation of servers and applications across nine remote sites.
- It was experiencing performance and reliability issues.
- It needed to downsize its IT staff.
- There were inadequate security/access controls.
- It had a poor disaster recovery plan.

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

- Dependable, efficient, secure network
- Centralized applications, data storage and maintenance
- Increased communications capability (wireless, videoconferencing, secure systemwide access)
- Antispam, antiworm, antivirus protection
- New attorney interface

Using Sun's Enterprise Consolidation Methodology

Already a Sun hardware customer, Anonymous started its initial planning efforts with Sun in January 2003. It had about 50 business applications distributed across seven remote offices. This multi-office environment consisted of a Sun 9980 SAN and 170 Microsoft Windows-based servers. It had eight Sun Solaris servers and four AIX RS6000 servers running a legacy accounting system. Each office had application servers and its own mini-SAN. Anonymous did not have a central data center.

During early 2003, Sun Services provided architecture design, development, system configuration, and implementation support in helping Anonymous consolidate its Microsoft Windows-based servers onto Sun Fire V880 and V480 servers running the Solaris 8 Operating System in a centralized, outsourced data center near its headquarters.

The resulting plan called for the following initial activities:

- Shift to an enterprise approach
- Move from Windows to Unix
- Outsource:
 - Labor- and knowledge-intensive activities
 - Single and central data center
 - Maintenance for the SAN, servers, and network
- Develop key vendor relationships including Sun for:
 - Network architecture
 - SAN and servers
 - Security
 - Desktop/Sunrays
 - Professional services

Consolidation activities began in June 2003 and Anonymous' data center now consists of Sun Fire V880 systems using Oracle8i databases and Sun Fire V480 servers powering the firm's document management system. The Sun Fire V480 servers are clustered using Sun Cluster 3.0 software in a Sun Fire B1600 Intelligent Shelf to support its development, test, and production environments. It has also deployed Sun Fire B100s Blade Servers, all running the Solaris 8 Operating System, to power its Web applications.

Costs And Benefit Savings

Anonymous made a significant initial investment in its new data center environment in support of its consolidation goals, as follows:

Data Center Setup (one-time costs)

| | |
|--------------------------------|--------------------|
| San 9980 | \$1,800,000 |
| Switches | 187,500 |
| Servers | 46,000 |
| Routers, firewall | 30,000 |
| IDX, IMUX | 10,000 |
| Total | \$2,073,500 |
| Less: server upgrade avoidance | (\$390,000) |
| Net capital investment | \$1,683,500 |

In addition, *annual* operating expenses increased as follows:

Annual Cost Increases

| | |
|-----------------------|------------------|
| Data center contract | \$209,760 |
| Bandwidth | 80,832 |
| System admin/support | 122,400 |
| Data backup | 60,000 |
| Maintenance contract | 48,672 |
| Additional data lines | 4,704 |
| Total | \$526,368 |

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 predicts the following *annual* expense reductions related to its consolidation efforts:

Annual IT Cost Savings And Benefits

| | |
|---|--------------------|
| Reduction in system engineers (4) | \$440,000 |
| Reduction in applications engineers (4) | 440,000 |
| Licensing fees | 320,000 |
| Local loop | 17,258 |
| Switching to SunRays | 240,000 |
| SAN maintenance | 190,574 |
| Network savings | 395,000 |
| Total | \$2,042,832 |

Anonymous reported considerable end user (attorney) productivity losses prior to consolidation due to system interruptions, downtime, maintenance issues, access problems, viruses and worms, server crashes, etc. Anonymous estimates that after consolidation, its new IT environment will be more reliable and have higher performance, which will significantly improve staff productivity (i.e., reduce lost billable time and reduce staff overtime costs). Although difficult to quantify, Anonymous estimates that annual savings could be in the \$2 million to \$4 million range, or \$4,000 to \$8,000 per attorney.

Although the consolidation has created a more productive end user environment at Anonymous, it is difficult for Forrester to quantify the actual value of this added productivity. Technology can drive productivity improvements only if there is a balance between IT, business processes/controls, and accountability for the investment's actual productivity impact. New technologies only work when employees change how they work so that the new technology gets incorporated into daily activities, and they use their future, new-found available time to actually be more productive.

Based on our interviews with Anonymous, it did not have a plan or method to value the "actual" productivity increases, i.e., to monitor and measure the increase in productivity and subsequently hold stakeholders accountable for acting to either downsize the organization (savings), or to have a plan to adjust attorney revenue goals as a result of increased productivity (billings).

Although unwilling to use Anonymous' estimate of \$2 million to \$4 million in savings, Forrester feels it is prudent, practical, and conservative to include 30% of the average of the range of these reported productivity benefits in our ROI calculations. (The calculation is 30% of the range average of \$3 million, or \$900,000 annually, equating to \$1,800 per attorney in productivity improvements.). Note that approximately 50% of the risk-adjusted ROI is attributed to these productivity benefits.

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. The only risk cited was cultural, i.e., the attorneys perceived a risk in moving data that had always been "safely" collocated in the same building to a "remote" data center. Finally, 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 has plans to add new productivity and/or revenue applications to its computing environment during the next two years. Specifically, it plans to implement a portal that will allow each lawyer to use one device to access all applications remotely and wirelessly, increasing attorney productivity. In addition, once the consolidation effort is complete and it has migrated from Windows to Solaris, the new environment will allow them to use Linux in 2005 for back-office 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, including the planned portal. We believe 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 **\$461,042** 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 **129%** (**144%** non risk-adjusted). The three-year NPV of savings is **\$4,368,080** (risk-adjusted) and **\$4,870,221** (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.