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## **The Total Economic Impact Of Sybase Adaptive Server Enterprise 15**

Multicompany Analysis

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## The Total Economic Impact™ Of Sybase Adaptive Server Enterprise 15

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## Executive Summary

In April 2007, Sybase commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that Sybase customers may realize by upgrading their existing Adaptive Server Enterprise (ASE) platform to Adaptive Server Enterprise 15 (ASE 15). ASE 15 is the latest generation of database management system (DBMS) software from Sybase. ASE 15 adds increased manageability, availability, security, and performance features not found in previous versions of ASE. These features include the use of improved query optimization and database partitioning.

In conducting in-depth interviews with four existing customers, Forrester confirmed customers experienced the benefits of improved IT and operational efficiency, higher capital efficiency through IT hardware cost avoidance, and improved availability and continuity for internal and external applications. These benefits contributed to positive ROI's for interviewed customers.

### Purpose

The purpose of this study is to provide readers with a framework to evaluate the financial impact of migrating to ASE 15 within their organizations. Forrester's aim is to clearly show all calculations and assumptions used in the analysis. Readers should use this study to better understand and communicate a business case for migrating to ASE 15.

### Methodology

Sybase selected Forrester for this project because of its industry expertise in database management and Forrester's Total Economic Impact™ (TEI) methodology. TEI 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.

For this study, Forrester employed four fundamental elements of TEI in modeling the migration to ASE 15:

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

Given the increasing sophistication that enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves a useful purpose by providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

### Approach

Forrester used a five-step approach for this study.

1. Forrester gathered data from existing Forrester research relative to ASE 15 and the database management market in general.

2. Forrester interviewed ASE 15 subject matter personnel to fully understand the potential (or intended) value proposition of Sybase database solutions.
3. Forrester conducted a series of in-depth interviews with four organizations currently using ASE 15.
4. Forrester constructed a financial model representative of the interviews. The financial model contains a set of common costs and benefits provided by the interviewees. This model can be found in the TEI Framework section below.
5. Forrester created a composite organization based on the interviews and populated the framework using data from the interviews as applied to the composite organization. The composite organization is meant to be representative of the common characteristics among the interviewees and is used as a basis for driving the analysis.

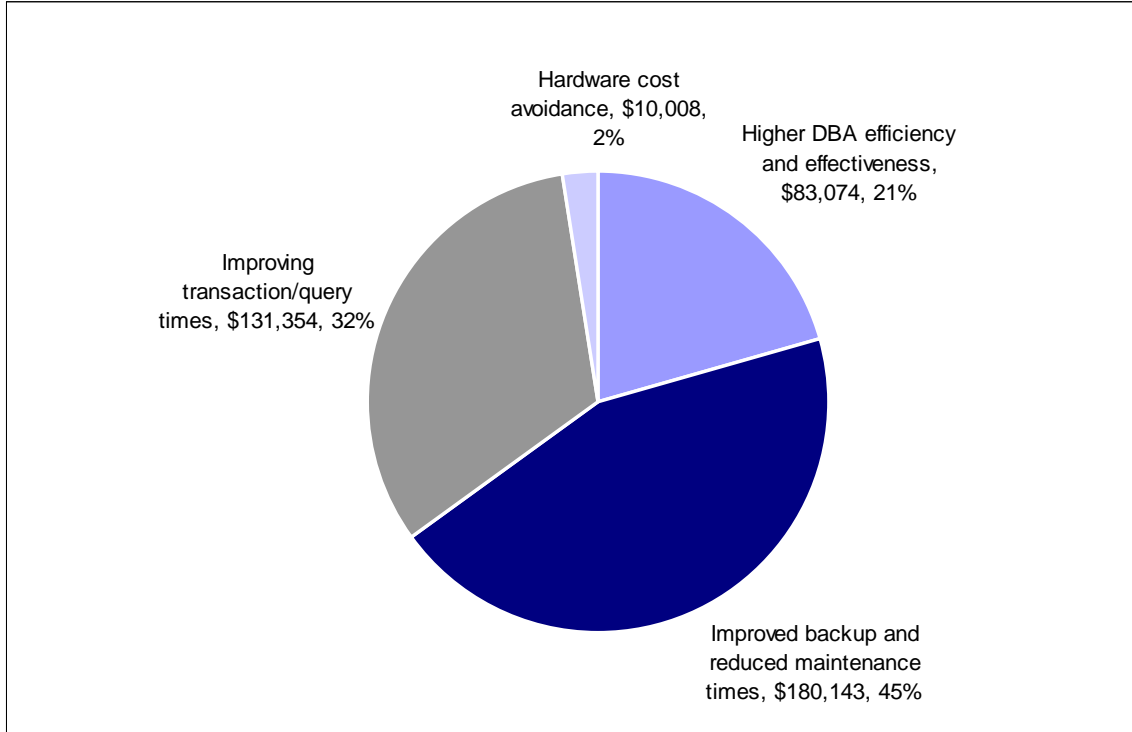
## Key Findings

Forrester's study yielded several key findings:

- **ROI.** Based on the customer interviews, Forrester constructed a TEI framework for a composite organization (see Appendix A) and the associated ROI analysis illustrating the financial impact areas. A risk adjusted ROI takes into account the variability of original cost and benefit estimates. Key highlights include:
  - Three year risk adjusted ROI of 73%
  - Positive financial payback within 1.28 years
- **Benefits.** Benefits identified by the interviewees included
  - Improved DBA productivity and operational efficiency. Organizations noted the additional features found in ASE 15 allowed them to control the growth of IT staff while at the same time make existing IT staff more efficient. The composite organization constructed to represent those customers interviewed assumes a 30% reduction in annual growth of staff.
  - Improved availability and continuity for internal and external applications. Organizations noted the use of ASE partitions provided the ability to scale up and provide greater control over database operations and allowed for higher levels of availability and reliability within their ASE environment. As a result, the composite organization assumes a 15% reduction in the number of maintenance windows impacting end users and a 20% reduction in the number of stalled or lost queries.
  - Higher capital efficiency through IT hardware cost avoidance. Organizations stressed the requirement to maintain high levels of application performance while anticipating continued growth in total amounts data and numbers of transactions. Several organizations found the performance improvements provided by ASE 15 reduced the need to purchase additional processing power in order to achieve high levels of performance. As a result, the composite organization assumes a 30% reduction in hardware growth as a result of the migration to ASE 15.

Figure 1 illustrates a breakdown in the three year present value benefits attributable to the composite organization:

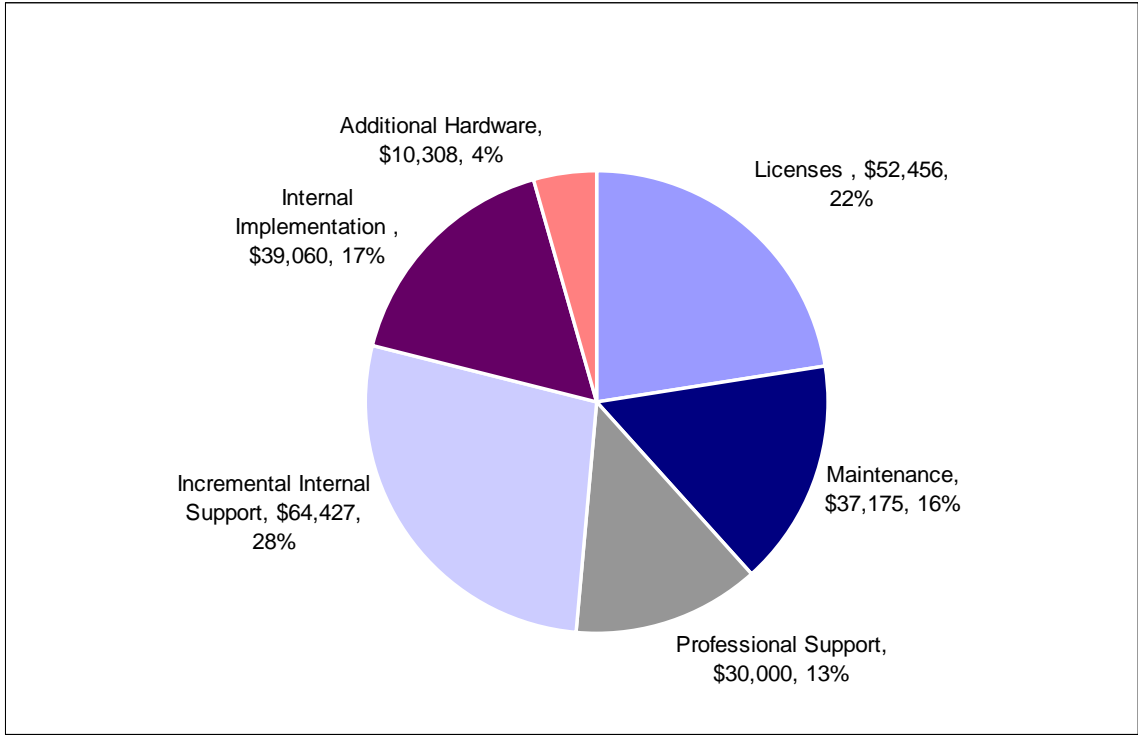
**Figure 1: Total 3 Year Risk Adjusted Benefit (PV)**



Source: Forrester Research, Inc.

- **Costs.** Costs to migrate to ASE 15 from a previous version of ASE included the cost of additional licenses, maintenance, implementation and planning, changes in ongoing administration, and server hardware. Figure 2 illustrates the three year costs attributable to the composite organization:

Figure 2: Total 3 Year Risk Adjusted Cost (PV)



Source: Forrester Research, Inc.

Table 1 provides the risk-adjusted cash flow for the composite organization, based on data and characteristics obtained during the interview process. Forrester risk-adjusts these values to take into account the potential uncertainty that exists in estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimation, incorporating any potential risk factors that may later impact the original cost and benefit estimates. For a more in-depth explanation of risk and risk adjustments used in this study, please see the Risk section of this document.

**Table 1: Summary Financial Metrics, Composite Organization**

Summary financial results	Original estimate	Risk-adjusted
ROI	90%	73%
Payback period (years)	1.16	1.28
Total costs (present value)	\$233,426	\$233,426
Total benefits (PV)	\$442,618	\$404,579
Total (net present value)	\$209,192	\$171,153
Internal rate of return (IRR)	82%	70%

Source: Forrester Research, Inc.

Forrester found higher ROIs were associated with organizations that had a greater number of database applications, the growth and complexity of the database environment, as well as the scalability requirements of the database applications.

## Disclosures

The reader should be cognizant of the following:

- The study is commissioned by Sybase and delivered by the Forrester Consulting group.
- Sybase 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 contradicted Forrester’s findings or obscured the meaning of the study.
- The customer names for the interviews were provided by Sybase.
- Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of a migration to Sybase ASE 15.
- This study is not meant to be used as a competitive product analysis.

## Sybase Adaptive Server Enterprise 15: Overview

According to Sybase, it released ASE 15 to meet the increasing demands of large databases and high transaction volumes, while providing a cost effective database management system.

Sybase ASE 15 substantially enhances a database platform already known for its superior performance, reliability and low total cost of ownership (TCO), adding unique security options and a host of new features that boost performance while reducing operational cost and risk.

Some highlights of these new features included the following:

- On-disk encryption is a unique, patent pending encryption system that does not require application modifications, thus keeping down the cost of implementation. Using column-based encryption, organizations have the option of encrypting selective parts of databases and tables.
- Smart Partitions make large databases easy to manage and more efficient by allowing users to divide tables into smaller partitions that can be individually managed. Maintenance tasks can be run on selected partitions to avoid slowing overall performance, and queries run faster because ASE 15's smart query optimizer bypasses partitions that don't contain relevant data.
- Next Generation Query Engine dramatically enhances the reporting of complex information through a patented query optimizer, which speeds query performance by supporting new techniques to optimize performance such as improved star-joins, join histograms, partition elimination, and goals-based optimization.

## Analysis

As stated in the Executive Summary, Forrester took a multistep approach to evaluate the impact that migrating to ASE 15 can have on an organization:

- Interviews with Sybase subject matter personnel.
- In-depth interviews of four organizations that had migrated to ASE 15.
- Construction of a common financial framework for the migration of ASE 15.
- Construction of a composite organization based on characteristics of the interviewees.

## Interview Highlights

A total of four interviews were conducted for this study involving representatives from the following companies:

1. A national lending and financial services organization with a total of five databases running on ASE with an average database size of 924GB. Applications accessing the database include both internal analytical and external transactional systems.
2. A national health services organization with roughly 20 databases, 90% of which under ASE management, the largest ASE database being 160GB. Major applications that access these

databases included laboratory control and analysis as well as medicine control logistical systems.

3. A 750,000 member US-based non-profit organization using Sybase to manage multiple databases across the organization. Applications that access the individual databases included membership management and packaged travel tools.
4. A US-based online retail organization with databases ranging in size from 50GB to 5TB. Major applications that access the ASE supported databases include applications that provide merchants with the ability to analyze customer buying behavior as well as providing customers with comparison shopping tools for a variety of products.

A composite organization created from the results of the customer interviews represents a US-based financial services organization with roughly 3,000 employees and a total of eight databases each managed by Sybase ASE 15 ( see Appendix A).

The four in-depth interviews discovered instances in which organizations were able to improve DBA and support efficiency, higher capital efficiency through IT hardware cost avoidance, and improved business continuity for internal and external applications. In particular, these organizations shared a set of common challenges that drove the calculations of benefits for the composite organization:

- **Rapid growth of data.** All organizations noted that demand for greater and greater database resources were a key driver in their decision to upgrade to ASE 15 from previous versions of ASE through the use of query optimization and database partitioning. Several of the organizations interviewed noted that anticipated data growth upwards of 50% annually.
- **Need to control and manage IT costs.** As their database environments grew in size and complexity, these organizations also experienced pressure to control the labor and capital costs associated with data administration. The migration to ASE 15 allowed these organizations to increase the efficiency and control over their data environment through query optimization and data portioning, reducing the expected capital and labor cost.
- **Maintain high levels of availability and scalability.** Another common theme among the interviewees was the need to maintain high levels of application availability as their environments grew more complex and the size of the individual databases increased. Organizations noted ASE 15 provided the flexibility to reduce the impact of changes to the database on internal and external users while at the same time optimizing database performance.

## TEI Framework

### Introduction

From the information provided in the in-depth interviews, Forrester has constructed a TEI framework for those organizations considering the migration to ASE 15. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that impact the investment decision.

### Framework Assumptions

Table 2 lists the discount rate used in the PV and NPV calculations and the time horizon used for the financial modeling.

**Table 2: General Assumptions**

Ref.	General assumptions	Value
	Discount rate	8%
	Length of analysis	Three years

Source: Forrester Research, Inc.

Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their finance departments to determine the most appropriate discount rate to use within their own organizations.

In addition to the financial assumptions used to construct the cash-flow analysis, Table 3 provides salary assumptions used within this analysis.

**Table 3: Salary Assumptions**

Metric	Calculation	Value
Hours per week		40
Weeks per year		50
Working hours per year (M-F, 9-5)		2,000
Hours per year (24x7)		8,736
DBA administrator		\$125,000
Hourly	(A5/A3)	\$63

Source: Forrester Research, Inc.

## Costs

Costs around the migration to ASE 15 include cost of additional licenses, maintenance, implementation and planning, changes in ongoing administration, and server hardware. The actual

cost of the migration will vary depending on the number and size of databases migrated as well as existing labor and hardware resources.

*License Cost*

In general, organizations were able to reuse their existing licenses for the upgrade to ASE 15. However, in some cases, several organizations purchased additional licenses specifically for partitions features as part of ASE 15. Having partitions in place was a key driver for several organizations in improving the flexibility and scalability of their environment.

In the case of the composite organization, we assume the organization purchases 14 additional licenses, six CPU-based licenses for partitions, four standby licenses, and four licenses for development and testing. For the purpose of this analysis, the list price of the CPU licenses is \$7,995 for primary, \$2,000 for standby licenses, and \$2,400 for development and testing. To construct the total cost of licenses, we also assume a standard 20% discount for each of the license types. Table 4 provides an illustration of the calculation used.

**Table 4: ASE 15 Licensing**

Ref.	Metric	Calculation	Initial cost
A1	Number of licenses — Partitions		6
A2	List price		\$7,995
A3	Net price	A1*A2	\$47,970
A4	Number of licenses — Standby		4
A5	List price		\$2,000
A6	Net price	A4*A5	\$8,000
A7	Number of licenses — Development and testing		4
A8	List price		\$2,400
A9	Net price	A7*A8	\$9,600
A10	Estimated discount	20%	
A11	Total cost	(A3+A6+A9)*(1-A10)	\$52,456

Source: Forrester Research, Inc.

*Annual Maintenance*

The composite organization will also incur maintenance cost on the additional ASE licenses purchased. Sybase prices support and maintenance either by a fixed price per CPU or as a percentage off of list CPU pricing. For the purpose of this analysis, Forrester assumes the organization pays a yearly percentage, equivalent to 22% off of list pricing. Table 5 illustrates the equation that was used.

**Table 5: Annual Maintenance**

Ref.	Metric	Calculation	Initial cost
B1	Total license cost — List price	A3+A6+A9	\$65,570
B2	Annual maintenance — Percentage	22%	
B3	Total annual cost		\$14,425

Source: Forrester Research, Inc.

*Implementation Cost*

The interviewees indicated that the implementation cost to migrate to ASE 15 was also a component of the overall investment cost. Most interviewees relied on either their own internal staff for implementation or their staff in combination with external professional services. The initial implementation time to pilot stage was relatively quick. The time to get into production was between three and six months. Implementation costs include the cost to server provisioning, system administration team to load the offering system and patch it, the cost for the networking team to hook that into the network and with the networking gear if it needs certain ports, and the cost of a DBA installing the software and patching. The cost of professional services included the additional cost to tune, test and implement to the organization’s environment. For the purpose of this analysis, two internal staff will be involved in implementation and training. The staff will spend an estimated 310 hours each on implementation at a fully-burdened hourly cost of \$63. In addition, we estimate the organization spends \$30,000 over the four to six months on professional services. Table 6 details the total implementation cost.

**Table 6: Implementation Cost**

Ref.	Metric	Calculation	Initial cost
C1	Number of FTE's	2	
C2	Hourly Salary	\$63	
C3	Total number of hours	310	
C4	Internal implementation cost	C1*C2*C3	\$39,060
C5	Professional support		\$30,000
C6	Total implementation cost	C4+C5	\$69,060

Source: Forrester Research, Inc.

*Administrative And Support Costs*

In addition to initial implementation costs, Forrester assumes that the incremental change in ongoing support costs is minimal relative to the overall efficiency savings resulting from the switch to ASE 15. Ongoing maintenance costs include the change in labor necessary to support and manage the new ASE partitioned environment. The composite organization will increase their allocation of one staff member on average one-fifth of his time to support and manage the ASE 15

environment from the previous ASE environment. Assuming a fully-burdened cost of \$125,000, we can calculate the total yearly cost of administration and support equates to \$25,000. Table 7 shows the equation used.

**Table 7: Administration And Support Costs**

Ref.	Metric	Calculation	Initial cost
D1	Number of FTEs		0.2
D2	Salary		\$125,000
D3	Total cost	D1*D2	\$25,000

Source: Forrester Research, Inc.

### Hardware Costs

In addition, some organizations needed to purchase additional hardware components for the upgrade to ASE 15. This cost includes the basic cost of CPU and memory upgrades as well as any additional network connectivity upgrades. Generally organizations interviewed indicated they had to upgrade their hardware as they moved to ASE 15 as part of an overall refresh of their hardware infrastructure. While several organizations stated there was no incremental cost of additional hardware due to reuse of existing hardware, we assume the possibility a representative organization may need to purchase additional hardware to run ASE 15. For the purpose of this analysis, we assume the average cost to upgrade the basic hardware is \$20,000. We also assume a standard straight line depreciation of 5 years. Table 8 shows the incremental cost of hardware.

**Table 8: Hardware Costs**

Ref.	Metric	Calculation	Initial cost
E1	Additional hardware		\$20,000
E2	Refresh rate (years)		5
E3	Annual depreciation	E1/E2	\$4,000

Source: Forrester Research, Inc.

### Total Costs

The total cost for the composite organization for the migration to ASE 15 is illustrated in Table 9. We assume the total incremental costs include both the upfront costs incurred during the migration as well as any additional incremental costs to maintenance, support and administration resulting from the migration.

Table 9: Total Costs — Non-Risk-Adjusted

Cash-Flow Analysis (Original Estimates)						
Costs	Initial	Year 1	Year 2	Year 3	Total	Present value
Incremental Licenses	\$52,456				\$52,456	\$52,456
Maintenance		\$14,425	\$14,425	\$14,425	\$43,275	\$37,175
Professional support	\$30,000				\$30,000	\$30,000
Incremental internal support		\$25,000	\$25,000	\$25,000	\$75,000	\$64,427
Internal implementation	\$39,060				\$39,060	\$39,060
Additional hardware		\$4,000	\$4,000	\$4,000	\$12,000	\$10,308
<b>Total cost</b>	<b>\$121,516</b>	<b>\$43,425</b>	<b>\$43,425</b>	<b>\$43,425</b>	<b>\$251,791</b>	<b>\$233,426</b>

Source: Forrester Research, Inc.

## Benefits

The second component of this analysis considers the potential benefits associated migrating to ASE 15. Among the ASE 15 customers interviewed, benefits included improved DBA and support efficiency, higher capital efficiency through IT hardware cost avoidance, and improved availability and continuity for internal and external applications.

### *Higher DBA Efficiency And Effectiveness*

A common theme among the interviewees was whether migrating to ASE 15 provided additional capability to manage their expanding database environments more effectively without having to significantly increase DBA staff. Typical tasks impacted by the migration included scheduled and unscheduled maintenance of the database, running backups, and upgrading new hardware and software.

ASE 15 customers said the impact of improved administration efficiency was realized through either a transfer of existing staff away from administration to more strategic functions or an anticipated reduction in the growth of DBA staff with the anticipated growth of data. Based upon the findings of the interviewees, the composite organization had a staff of three FTEs at a fully-burdened salary of \$125,000. Through the use of ASE 15 and the use of partitions, the organization was able to reduce the time taken during many of the tasks in previous versions of ASE thus reducing the annual growth of staff by 30%. Table 10 shows the calculation used.

**Table 10: Higher DBA Efficiency And Effectiveness**

Ref		Calculation	Metric
A1	Baseline number of DBAs		3
A2	Estimated annual growth of FTE		1
A3	Estimated reduction in annual growth		30%
A4	Fully DBA burdened cost		\$125,000
A5	Total savings	$A2 * A3 * A4$	\$37,500

Source: Forrester Research, Inc.

*Improved Backup And Reduced Maintenance Times*

The impact of reduced maintenance times and higher query performance also has an effect on internal and external users of database applications. In the case of internal users, several organizations note that having reduced maintenance windows had the effect of maintaining high levels of availability for internal users who may access the application. The use of partitions allows the organization to narrow time windows for scheduled maintenance on individual databases, allowing part of the database to be maintained without eliminating availability to the end-user population.

One customer experienced a “5x to 10x improvement in maintenance times.” Another customer experienced “a 75% reduction in the time it took to perform backups.”

To calculate this benefit, we assume the organization performs two scheduled backups per month. The average length of these backups is 16 hours and is typically performed during non-business hours. Of the total number of maintenance windows, roughly 15% go past their scheduled time and impact end-user working hours. On average, if maintenance windows are extended to normal working hours, we assume the disruption typically lasts on average 2 hours and results in a 20% improvement in productivity for the end user. Table 11 shows the calculation used.

**Table 11: Improved Backup And Reduced Maintenance Times**

Ref		Calculation	Metric
B1	Monthly number of backups/scheduled maintenance		2
B2	Months per year		12
B3	Average length of maintenance window (hrs)		16
B4	% of maintenance windows impacting end users		15%
B5	Hours impacting business process		2
B6	Number of concurrent users		1,000
B7	Hourly salary		60
B8	Productivity factor		20%
B9	Total savings	$B1*B2*B4*B5*B6*B7*B8$	\$86,400

Source: Forrester Research, Inc.

*Improving Transaction/Query Times*

In addition to improving the availability to internal users of the database, another goal of migrating to ASE 15 was the requirement to improve performance, reduce query response times and reduce disruptions to external users. Several of the organizations interviews noted with the growth in external queries and transactions, the need to minimize the length of maintenance windows and backups while at the same time maintaining high levels of performance was a key factor in migrating to ASE 15.

One customer noted their “query response times have been reduced by 40%” Another customer calculated the “value lost from failed external queries ranged from \$50 to \$800.”

To calculate this benefit, we assume the organization currently has on average 10,000 transactions per month. Of these 10,000 transactions, we assume that roughly 5% are not completed due to the database not being available, with 20% of lost transactions irrecoverable. Based on results of the interviews, we assume that the number of incomplete queries can be reduced by 25%. Assuming and average transaction value of \$200, we can calculate the total value regained from improved system availability. Table 12 shows the calculation used.

**Table 12: Improving Transaction/Query Times**

Ref		Calculation	Metric
C1	Average number of concurrent users (external)		10,000
C2	% of complex queries lost		5%
C3	Estimated reduction lost or stalled queries		25%
C4	Average transaction value		\$200
C5	Value lost		20%
C6	Number of months		12
C7	Total savings	$C1 * C2 * C3 * C4 * C5 * C6$	\$60,000

Source: Forrester Research, Inc.

**Hardware Cost Avoidance**

One additional benefit mentioned by the interviewed organization was the ability to reduce its hardware spending through increase in performance offered by ASE 15. One organization noted in the past to improve transaction performance required the purchase of commodity CPU and memory. With the migration to ASE 15, the organization saw they could reduce their projected growth of hardware by 20% resulting in cost savings by reducing the need to buy additional CPU and memory to improve performance.

One organization in particular stated “If I only get 10% performance boost, we’re still talking dozens of servers I don’t need to buy. And it’s still real estate and the data center and power and cooling and system of the administration and networking.”

To calculate this benefit, we assume the organization prior to ASE migration increases their hardware footprint by 20% per year to meet performance requirements with the growth in data resulting in an annual hardware spend of \$16,000. With ASE 15, the organization expected to reduce that spend by 30% or \$4,800 per year. Table 13 shows the calculation used.

**Table 13: Hardware Cost Avoidance**

Ref		Calculation	Metric
D1	Projected growth of hardware		20%
D2	Average annual hardware spend		\$16,000
D3	Reduction in growth		30%
D4	Total Savings	$D2 * D3$	\$4,800

Source: Forrester Research, Inc.

**Total Benefits**

Table 14 shows the total benefits over a three-year period. Savings were reduced by 25% in Year 1 to take into account the time to migrate to ASE 15.

Table 14: Total Benefits — Non-Risk-Adjusted

Benefits	Year 1	Year 2	Year 3	Total	Present value
Higher DBA efficiency and effectiveness	\$28,125	\$37,500	\$37,500	\$103,125	\$87,961
Improved backup and reduced maintenance times	\$64,800	\$86,400	\$86,400	\$237,600	\$202,661
Improving transaction/query times	\$45,000	\$60,000	\$60,000	\$165,000	\$140,737
Hardware cost avoidance	\$3,600	\$4,800	\$4,800	\$13,200	\$11,259
Total savings	\$141,525	\$188,700	\$188,700	\$518,925	\$442,618

Source: Forrester Research, Inc.

## Risk

Forrester defines two types of investment risk associated with this analysis: implementation and impact risk. **Implementation risk** is the risk that a proposed technology investment may deviate from original resource requirements needed to implement and integrate the investment, resulting in higher costs than anticipated. **Impact risk** refers to the risk that the business or technology needs of the organization may not be met by the technology investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates. Quantitatively capturing investment risk, by directly adjusting the financial estimates, results in more meaningful and accurate estimates and a more accurate projection of the return on an investment.

The following implementation risks are identified as part of this analysis:

- Installation and testing could demand more time and take longer than originally anticipated.
- Hardware and software costs could be higher than originally anticipated.
- The administrative cost to support the environment could be higher than originally anticipated.

The following impact risks are identified as part of the analysis:

- Administration cost savings could be lower than originally anticipated.
- Backup reduction times and maintenance windows could be less than originally anticipated.
- Hardware cost reduction could be less than originally anticipated
- Downtime reduction could be lower than originally anticipated.

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. TEI applies a probability density function known as triangular distribution to the values entered. At a minimum, three values are calculated to estimate the

underlying range around each cost and benefit estimate. 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. In this study, Forrester discovered that engaging with Sybase was a relatively low-risk endeavor, as expressed by the interviewed organization, and applied a risk factor of 100% to the costs and between 94% and 89% to the benefits to arrive at a risk-adjusted number. Table 15 provides a risk-adjusted breakdown of the benefits received.

**Table 15: Risk Adjustment — Benefit**

Benefits	Year 1	Year 2	Year 3	Total	Present value
Higher DBA efficiency and effectiveness	\$26,563	\$35,417	\$35,417	\$97,396	\$83,074
Improved backup and reduced maintenance times	\$57,600	\$76,800	\$76,800	\$211,200	\$180,143
Improving transaction/query times	\$42,000	\$56,000	\$56,000	\$154,000	\$131,354
Hardware cost avoidance	\$3,200	\$4,267	\$4,267	\$11,733	\$10,008
<b>Total savings</b>	<b>\$129,363</b>	<b>\$172,483</b>	<b>\$172,483</b>	<b>\$474,329</b>	<b>\$404,579</b>

Source: Forrester Research, Inc.

## Flexibility

Flexibility, as defined by Forrester’s TEI methodology, represents an investment in additional capacity or agility today that can be turned into *future* business benefits at some additional cost. Flexibility benefits typically increase with the scalability of the technology investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so. In the case of this investment, there are multiple scenarios in which a customer might choose to migrate to ASE 15 with the intention of using additional components such as encryption and computed columns to further drive benefit throughout the organization. Database encryption provides an additional layer of security at the database, reducing the vulnerability of threats to the database. Computed columns provide additional efficiencies within the database environment by reducing the time it takes to run repetitive queries.

While Forrester believes organizations who migrate to ASE 15 can take advantage of these flexibility options, quantification (using the financial industry standard Black-Scholes or the binomial option pricing models) of the additional value associated with these options for this customer would require scenario development and forward-looking analysis that is not available at this time.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company (see Appendix B for additional information regarding the flexibility calculation).

## TEI Framework: Summary

Considering the financial framework constructed above, the results of the costs, benefits, flexibility, and risk sections using the representative numbers can be used to determine a return on investment, net present value, and payback period. Table 16 shows the consolidation of the numbers for the composite organization.

**Table 16: Cash Flow Summary — Non-Risk-Adjusted**

<b>Cash-Flow Analysis (Non-Risk-Adjusted)</b>						
<b>Project cash flow</b>	<b>Initial</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total</b>	<b>Present value</b>
Total costs	\$121,516	\$43,425	\$43,425	\$43,425	\$251,791	\$233,426
Total benefits	\$0	\$141,525	\$188,700	\$188,700	\$518,925	\$442,618
Net savings	-\$121,516	\$98,100	\$145,275	\$145,275	\$267,134	\$209,192
ROI	90%					
Payback period (years)	1.16					

Source: Forrester Research, Inc.

Table 17 below shows the risk-adjusted values, applying the risk adjustment method indicated in the Risk section and the values from Table 15 to the numbers in Tables 9 and 16.

**Table 17: Cash Flow Summary — Risk-Adjusted**

<b>Cash flow analysis (risk-adjusted)</b>						
<b>Project cash flow</b>	<b>Initial</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total</b>	<b>Present value</b>
Total costs	\$121,516	\$43,425	\$43,425	\$43,425	\$251,791	\$233,426
Total benefits		\$129,363	\$172,483	\$172,483	\$474,329	\$404,579
Net savings	-\$121,516	\$85,937	\$129,058	\$129,058	\$222,538	\$171,153
ROI	73%					
Payback period (years)	1.28					

Source: Forrester Research, Inc.

It is important to note that values used throughout the TEI Framework are based on in-depth interviews with four organizations and the resulting composite organization built by Forrester. Forrester makes no assumptions as to the potential return that other organizations will receive within their own environment. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of migrating to ASE 15.

## Study Conclusions

Forrester's in-depth interviews with ASE 15 customers yielded several important observations:

- Based on information collected in, Forrester found cases of improved DBA and support efficiency, higher capital efficiency through IT hardware cost avoidance, and improved availability and continuity for internal and external applications.
- Of the customers interviewed, several factors contributed to the difference in ROIs. Forrester found higher ROIs were associated with organizations that had a greater number of database applications, the growth and complexity of their database environment, as well as the scalability requirements of the database applications.

The financial analysis provided in this study provides a set of practical metrics an organization can use to evaluate the value proposition of migrating to ASE 15 from previous versions of ASE. Forrester calculated a three-year risk-adjusted ROI of 73% for the composite organization with a payback period of 1.28 years, based on this study. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

Based on these findings, companies looking to migrate to ASE 15 can realize quantitative benefits within their database environments. Using the TEI framework, many companies may find the potential for a compelling business case to make such an investment, or construct their own hypothetical ROI model.

## Appendix A: Composite Organization Description

The composite organization created from the results of the customer interviews represents a US-based financial services organization with roughly 3,000 employees and a total of eight Sybase databases managed by Sybase ASE 15. The average size of the ASE managed databases is 550 GB per database with database size ranging from 100GB to 1TB. Internal and external applications access the database. Internal applications include loan and mortgage scoring and analytical applications. External applications allow customers to check the status of their account, perform loan and mortgage analysis, and provide real-time transaction information. The organization decided to migrate to ASE 15 as a result of a need to control the IT costs associated with database management coupled with the need to maintain high levels of performance and availability to internal and external customers with the growth in transactional queries and database complexity.

The four in-depth interviews uncovered cases where the interviewees were able to improve DBA and support efficiency, higher capital efficiency through IT hardware cost avoidance, and improved availability and continuity for internal and external applications. In particular, the organizations interviewed shared a set of common challenges that drove the calculations of benefits for the composite organization:

- **Rapid growth of data.** All organizations noted that demand for greater and greater data resources were a key driver in making the move toward upgrading to ASE 15 from previous versions of ASE. Several of the organizations interviewed noted that anticipated data growth is expected upwards of 50% annually.
- **Need to control and manage IT costs.** As their database environments grew in size and complexity, interviewees also felt pressure to control labor and capital costs associated with data administration. The migration to ASE 15 allowed organizations to increase the efficiency and control over their data environment, reducing the expected capital and labor cost.
- **Maintain high levels of availability and scalability.** Another common theme among the interviewees was the need to maintain high levels of application availability as the environment grows more complex and the size of the individual database increases. Organizations noted ASE 15 provided the flexibility to reduce the impact of changes to the database on internal and external users while at the same time optimizing database performance.

## Appendix B: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research, Inc. that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

The TEI methodology consists of four components to evaluate investment value: 1) benefits; 2) costs; 3) risks; and 4) flexibility. For the purpose of this analysis, the impact of flexibility was not quantified.

### Benefits

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

### Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the forms of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

### Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

### Flexibility

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

## Appendix C: Glossary

**Discount rate:** The interest rate used in cash-flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set a discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their organizations to determine the most appropriate discount rate to use in their own environment.

**Net present value (NPV):** The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

**Present value (PV):** The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total net present value of cash flows.

**Payback period:** The breakeven point for an investment. This is the point in time when net benefits (benefits minus costs) equal initial investment or cost.

**Return on investment (ROI):** A measure of a project expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

### *A Note On Cash-Flow Tables*

The following is a note on the cash-flow tables used in this study (see the example table below). The initial investment column contains costs incurred at “time 0” or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Year 1 through Year 3 are discounted using the discount rate shown in Table 2 at the end of the year. Present value (PV) calculations are calculated for each total cost and benefit estimate. Net present value (NPV) calculations are not calculated until the summary tables and are the sum of the initial investment and the discounted cash flows in each year.

### **Example Table**

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.