A Forrester Total Economic Impact™ Study Prepared For Oracle

The Total Economic Impact of Oracle Exadata and Oracle Exalogic

Project Director: Jonathan Lipsitz

Contributors: Michael Speyer

September 2013

FORRESTER®

Headquarters | Forrester Research, Inc.
60 Acorn Park Drive, Cambridge, MA 02140 USA
Tel: +1 617.613.6000 | www.forrester.com

Forrester Consulting
Making Leaders Successful Every Day

TABLE OF CONTENTS

Executive Summary 2
Combined Benefits Of Oracle Exadata And Oracle Exalogic Are Greater Than The Sum Of The Parts 2
Factors Affecting Benefits And Costs 4
Disclosures 4
TEI Framework And Methodology 6
Analysis 8
Interview Highlights 8
Costs 10
Benefits 13
Flexibility 16
Risk 17
Financial Summary 19
Oracle Exadata And Oracle Exalogic: Overview 21
Appendix A: Total Economic Impact™ Overview 22
Appendix B: Glossary 23
Appendix C: Endnotes 24

About Forrester Consulting
Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit www.forrester.com/consulting.

Executive Summary

In January 2013, Oracle and Intel commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying Oracle Exadata Database Machine ("Oracle Exadata") and Oracle Exalogic Elastic Cloud ("Oracle Exalogic") together. Oracle Exadata and Oracle Exalogic are two key members of the Oracle Engineered Systems family. Oracle Engineered Systems are preconfigured, optimized systems consisting of Oracle's latest software and hardware engineered to work together. They are designed for maximum interoperability and performance.

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Oracle Exadata and Oracle Exalogic on their organizations.

The Combined Benefits Of Oracle Exadata And Oracle Exalogic Are Greater Than The Sum Of The Parts

Our interview with Square Two Financial, an existing financial services customer and subsequent financial analysis found that the organization we interviewed experienced the risk-adjusted ROI, costs, and benefits shown in Table 1. Square Two Financial migrated their proprietary eAGLE application, which helps law firms liquidate consumer debt, to Oracle Exadata/Exalogic.

Table 1
Three-Year Risk-Adjusted ROI[1]

ROI	Payback period	Total benefits (PV)	Total costs (PV)	Net present value
105%	14 months	$6,011,813	($2,933,971)	$3,077,842

Source: Forrester Research, Inc.

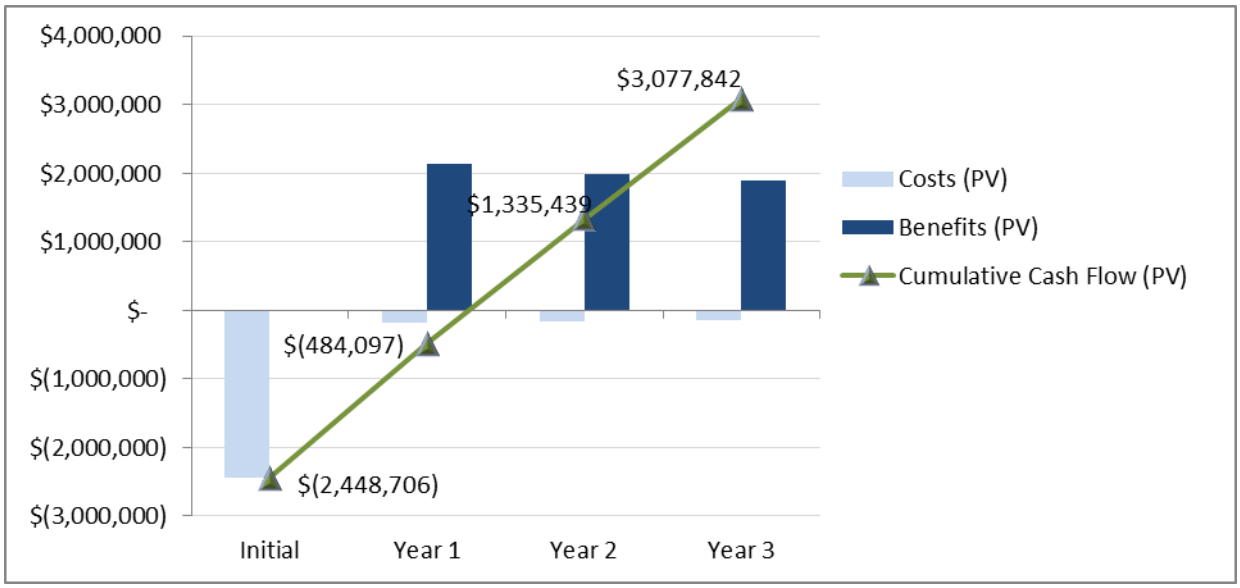
- **Benefits.** The organization we interviewed experienced the following benefits:
    - **Eliminated hardware and maintenance.** At the time of migrating to Oracle Exadata/Exalogic, the existing hardware was due for a regular life-cycle replacement in both the production and test/development environments. The eliminated database and application servers would have cost $198,400 in year one of the study, with ongoing maintenance of $35,000 per year. The three-year savings totaled $305,000.
    - **Revenue protection.** The company's eAGLE application, which now resides on the Oracle Exadata/Exalogic infrastructure, is the primary application for revenue generation. If the application is down, no revenue can be generated. Moving to Oracle Exadata/Exalogic has

reduced downtime by 16 hours per year. This translates into $1.85 million per year in revenue protection that would otherwise be lost.

- **Reduced IT operations team size.** The previous hardware infrastructure that hosted the company's primary application, eAGLE, was manually intensive to maintain and to expand. This increased the level of effort required to maintain and improve eAGLE. Previously, the company had six FTEs working on support and upgrades. It forecast that the team would have grown to 10 by year three of the study, a net increase of four IT professionals. Instead, the team shrank to two FTEs by year three, with four FTEs reassigned to other areas. The net savings by the end of year three was eight IT FTEs, resulting in a three-year total benefit of $2.5 million.
- **Improved system performance (unquantified).** One of the main benefits of Oracle Exadata and Oracle Exalogic used together is the significant improvement in application performance that can be achieved. The interviewed company saw a very large improvement in terms of transactions processed while reducing latency and peak loads. For example, application load times have decreased by 60% and database access times have decreased more than 70%.
- **Improved analytics (unquantified).** The Oracle Exadata/Exalogic solution provided the company and customers with more timely access to information and the ability to perform more robust data analytics. This has contributed to the company's increased revenue by helping find new business opportunities.

- **Costs.** The organization we interviewed experienced the following costs:
  - **Implementation internal labor.** The organization completed a proof of concept (POC), followed by a full migration of the eAGLE application to Oracle Exadata/Exalogic. Between the two phases, five months were spent on the project. There were 6.5 FTEs during the POC; this decreased to five FTEs for the deployment to production. These efforts included data transformation and migration. Internal implementation labor costs during the initial period totaled $307,000.
  - **Professional services.** The company used Oracle professional services throughout the initial deployment. Three full-time consultants worked on the project throughout the five-month life of the project. This equates to $495,000 in professional services costs.
  - **Oracle hardware, software licenses, and support.** The company installed two Oracle Exadata ¼ racks and two Oracle Exalogic ¼ racks, one each for production and test/development environments. The company also purchased ongoing software license, support, and maintenance for all four ¼ racks. The three-year total cost for the hardware, licenses, and support comes out to approximately $2.2 million.

Figure 1
Three-Year Risk-Adjusted Cash Flow



Source: Forrester Research, Inc.

Factors Affecting Benefits And Costs

Table 1 illustrates the risk-adjusted financial results that were achieved by the organization. The risk-adjusted values take into account any potential uncertainty or variance that exists in estimating the costs and benefits, which produces more conservative estimates. The following factors may affect the financial results that an organization may experience:

- **The size of the hardware being replaced and the size of the deployment**. The size of the hardware estate being replaced affects multiple cost and benefit categories. These include the cost of server life-cycle replacement along with the amount of labor required to maintain and update the solutions. The size of the deployment also directly correlates to the cost of the Oracle Exadata/Exalogic solution that is replacing the legacy systems.
- **The value of the applications deployed on Oracle Exadata/Exalogic**. The Oracle Exadata and Oracle Exalogic Engineered Systems are highly reliable and provide excellent performance improvements. These characteristics can be more valuable for systems that are linked to revenue generation or are mission-critical.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Oracle and delivered by the Forrester Consulting group.

- Forrester makes no assumptions as to the potential return on investment that other organizations will achieve. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Oracle Exadata and Oracle Exalogic.
- Oracle reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- The customer name for the interview was provided by Oracle.

TEI Framework And Methodology

Introduction

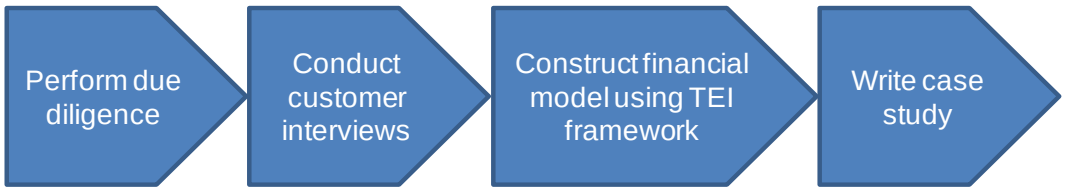
From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ framework for those organizations considering implementing Oracle Exadata and Oracle Exalogic. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Approach And Methodology

Forrester took a multistep approach to evaluate the impact that Oracle Exadata and Oracle Exalogic can have on an organization (see Figure 2). Specifically, we:

- Interviewed Oracle development, marketing and sales personnel as well as Forrester analysts to gather data relative to Oracle Exadata/Exalogic and the related marketplace.
- Interviewed one organization currently using Oracle Exadata and Oracle Exalogic to obtain data with respect to costs, benefits, and risks.
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite organization.

Figure 2
TEI Approach



Source: Forrester Research, Inc.

Forrester employed four fundamental elements of TEI in modeling Oracle Exadata and Oracle Exalogic solution:

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

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

Analysis

Interview Highlights

The company interviewed for this study was Square Two Financial. Square Two Financial created a sophisticated and proprietary system to analyze, distribute, and manage the data required to successfully purchase and liquidate consumer debt. Square Two Financial provides this data to its customers, law firms, who then work to collect payment on the debt.

The company is headquartered in Denver (Colorado); the primary data center is in Denver with a backup facility in Illinois. The company currently has approximately 275 employees. The interview was conducted with the CTO, who is also responsible for eAGLE application development.

For the Oracle Exadata/Exalogic implementation, Square Two Financial implemented a ¼ rack Oracle Exadata Engineered System and a ¼ rack Oracle Exalogic Engineered System in both the production and test/development environments. For middleware, it has the following Oracle software: Oracle Weblogic Server; Oracle Coherence; Oracle SOA Suite/Oracle B2B (beginning to use); and Oracle ADF. At the time of the interview, it was not using server virtualization because its (older) version of Oracle Exalogic does not support it. Virtualization is something that the firm will add in the future after upgrading to the latest version of Oracle Exalogic.

The interview with Square Two Financial uncovered the following salient points:

- The main reasons given for selecting Oracle Exadata/Exalogic were to support increased data growth, improve system performance, and simplify the infrastructure through automation.
    - "Our business has been growing at 15% per year, and our previous infrastructure could not keep up with our growth. We are expecting a lot more users and [products] to be loaded into the system. So we really needed a solution that could scale."
    - "Our performance was not good enough. Our goal was to get from a 4-second response time down to a 2-second response time for the application. To achieve this, we needed a single platform to host both the eAGLE application and all of the data."
    - "We needed a better handle on maintenance and operations. With our solution scattered across various vendor products, things were getting out of control. Oracle Exadata and Exalogic were a great way for us to simplify and consolidate our data."
- Oracle was chosen because of its integrated solution and the total cost of ownership was lower when overall performance was taken into consideration.
    - "There is an advantage to having a single IT provider. It eliminates finger-pointing between the software and hardware providers."

  - "Oracle is an all-in-one platform. In addition to the application layer, it provides the middleware and database layers of the stack."
  - "We looked at building our own solution that would deliver the performance of Exadata and Exalogic but quickly abandoned that idea. It was too expensive and would have taken much too long."

- Oracle Exadata and Oracle Exalogic work great together and are more than the sum of their parts.
  - "Exalogic by itself is a very good application server. When you pair it with Exadata, the benefits are huge."
  - "The optimizations that Oracle as built into Exadata and Exalogic are enormous."
- The option to use Oracle Exadata/Exalogic in cloud environments may prove very beneficial in the near future.
  - "We are starting to look at private clouds as a deployment option. If we go this route, Exadata and Exalogic will fit nicely into this strategy."
- The IT operations team can now focus on growth and future opportunities instead of fighting fires.
  - "The Oracle Exadata/Exalogic solution allowed us to start looking at more strategic technology issues and the future, not just quick fixes. It gave us the headroom needed to look at bigger topics."
  - "We were spending a lot of time trying to fix what we had. We didn't have time to make strategic changes for the future."
  - "We were spending so much time working on performance that we did not have enough time to bring new features to market as quickly as we wanted."
- eAGLE performance has improved significantly (discussed further in the benefits section of this study).
  - "From an IT perspective, eAGLE performance was my biggest concern in 2010. Today it is not an issue at all, and we don't worry about it."
  - "We created an eAGLE performance Index to track how well the system in performing. The Oracle Exadata/Exalogic solution has more than doubled this key performance indicator."

Framework Assumptions

Table 2 provides the model assumptions that Forrester used in this analysis.

Table 2
Model Assumptions

Ref.	Metric	Value
A1	IT employee annual fully burdened cost*	$125,000
*Fully burdened cost includes insurance, paid vacation, and any other costs borne by the organization.		

Source: Forrester Research, Inc.

The discount rate used in the PV and NPV calculations is 10% and the time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

Some dollar values presented in this study have been rounded to the nearest whole cent or dollar. Therefore, some of the calculation results in the subsequent tables may not exactly match the results if the reader follows the formulas and values presented.

Costs

This section describes the costs associated with the implementation and ongoing management of Oracle Exadata and Oracle Exalogic.

Implementation Internal Labor Costs

Square Two Financial undertook a three-month POC under a "try and buy" arrangement. As part of this, it implemented a full solution and then did performance testing to identify any improvements. There were 6.5 internal FTEs involved in the POC coming from the application, infrastructure, architecture, and storage teams. According to the company, "Through methodical analysis we isolated the benefits attributable Exadata or Exalogic. We concluded that the combination was significantly more valuable than either one alone." At the end of the POC, Square Two Financial decided to purchase Oracle Exadata/Exalogic.

The rollout into production was shorter and required fewer resources than the POC because so much had already been accomplished. Both phases included needed data transformation and migration. This phase took two months and consisted of five FTEs from the same teams as described above. For the purpose of ROI analysis, any subsequent deployment related costs and benefits are excluded.

Table 3
Implementation Internal Labor Costs

Ref.	Metric	Calculation	Initial
B1	Number of FTEs for the POC		6.5
B2	Number of months for the POC		3
B3	Number of FTEs for the rollout		5
B4	Number of months for the rollout		2
B5	IT monthly fully burdened cost	=A1/12 months	$10,417
Bt	Implementation internal labor costs	(B1*B2+B3*B4)*B5	$307,292

Source: Forrester Research, Inc.

Professional Services Costs

Square Two Financial was a very early adopter of Oracle Exadata/Exalogic, so its professional services experience was different than a typical deployment completed today. Forrester estimates that a current deployment of this size would require three full-time consultants for the duration of the implementation. Professional services included training for Square Two Financial's internal IT team. Consulting fees can vary widely depending on the service provider and any existing agreements for broader services. Readers are encouraged to discuss the likely costs with Oracle or their systems integrator.

Table 4
Professional Services Costs

Ref.	Metric	Calculation	Initial
C1	Number of consultant FTEs		3
C2	Number of months	B2+B4	5
C3	Monthly rate	$1,500/day*22 workdays	$33,000
Ct	Professional services costs	C1*C2*C3	$495,000

Source: Forrester Research, Inc.

Oracle Hardware, Software Licenses, And Support Costs

Square Two Financial deployed a ¼ rack Oracle Exadata and ¼ rack Oracle Exalogic in both the production and test/development environments. Forrester has used Oracle's published price list to calculate what a similar deployment might cost today. The reader's organization may be eligible for discounts, so Forrester recommends consulting with their Oracle account manager.

In addition to the upfront hardware and software purchase price, there is also an annually recurring ongoing support contract cost. This includes all of the necessary patches and updates.

Table 5

Oracle Hardware, Software Licenses, And Support Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Number of Oracle Exalogic ¼ racks added		2			
D2	Oracle Exalogic costs – hardware and software	D1*$475,000	$950,000			
D3	Oracle Exalogic ongoing support contract costs	D1*$57,000		$114,000	$114,000	$114,000
D4	Number of Oracle Exadata ¼ racks added		2			
D5	Oracle Exadata costs – hardware and software	D1*$330,000	$660,000			
D6	Oracle Exadata ongoing support contract costs	D2*$39,600		$79,200	$79,200	$79,200
Dt	Oracle hardware, software licenses, and support costs	D2+D3+D5+D6	$1,610,000	$193,200	$193,200	$193,200

Source: Forrester Research, Inc.

Total Costs

Table 6 shows the total costs associated with implementing and operating Oracle Exadata/Exalogic.

Table 6
Total Costs, Non-Risk-Adjusted

Ref.	Costs	Initial	Year 1	Year 2	Year 3	Total
Bt	Implementation internal labor costs	($307,292)				($307,292)
Ct	Professional services costs	($495,000)				($495,000)
Dt	Oracle hardware, software licenses, and support costs	($1,610,000)	($193,200)	($193,200)	($193,200)	($2,189,600)
	Total	($2,412,292)	($193,200)	($193,200)	($193,200)	($2,991,892)

Source: Forrester Research, Inc.

Benefits

The first half of this section looks at the benefits that could be quantified for this study. The second half of the Benefits section describes the qualitative benefits that the interviewed customer experienced from adopting Oracle Exadata and Oracle Exalogic but which could not be fully quantified in the financial model.

Eliminated Hardware And Maintenance Costs

The previous infrastructure for eAGLE was at the end of its life cycle and due for replacement. There were eight blades for the application servers and a large database server in both the production and test/development environments. This benefit only looks at the purchase and maintenance costs for the hardware. It addition, there is the implementation time savings as well as power and space savings. Readers should take these additional cost savings into consideration when evaluating the complete ROI for Oracle Exadata and for Oracle Exalogic.

Table 8
Eliminated Hardware And Maintenance Costs

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
E1	Eliminated database servers		$134,400		
E2	Eliminated application servers		$64,000		
E3	Eliminated maintenance costs	(E1+E2)*18%	$35,712	$35,712	$35,712
Et	Eliminated hardware and maintenance costs	E1+E2+E3	$234,112	$35,712	$35,712

Source: Forrester Research, Inc.

Revenue Protection

eAGLE is the company's primary system for revenue generation. If eAGLE is not working, no revenue is possible; as Square Two Financial said, "if eAGLE is down, we're not collecting any money." If it is performing slowly, revenue generation may be reduced. Prior to redeploying eAGLE to Oracle Exadata/Exalogic, there had been outages and performance problems. For the purposes of this study, this benefit only looks at revenue put at risk during full outages.

The number of unplanned downtime events has been cut in half since deploying to Oracle Exadata/Exalogic. This is expected to decrease further once virtualization is put in place. Forrester estimated the potentially lost revenue per hour based on publicly available financial information. Additionally, Forrester only recognized 85% of the potential loss because the transaction may complete at another time or the benefit might not be attributed to the increased performance and reliability of Oracle Exadata/Exalogic.

Table 9
Revenue Protection

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
F1	Reduction in the number of outages per year		8	8	8
F2	Hours per event		2	2	2
F3	Revenue per hour		$136,364	$136,364	$136,364
F4	Total reduced at risk revenue	F1*F2*F3	$2,181,818	$2,181,818	$2,181,818
F5	Percentage attributable to Oracle Exadata/Exalogic		85%	85%	85%
Ft	Revenue protection	F4*F5	$1,854,545	$1,854,545	$1,854,545

Source: Forrester Research, Inc.

Reduced IT Operations Team Size

The size of the team required to maintain the infrastructure hosting eAGLE, as well as application support, has decreased significantly since adopting Oracle Exadata/Exalogic. Previously, six FTEs were responsible for support and upgrades, and Square Two Financial estimated that the team would have grown to 10 to support the growth taking place. Team responsibilities included system maintenance, Linux administration, database administration, and application administration. Now, just two FTEs are responsible for keeping eAGLE and Oracle Exadata/Exalogic running. The four reassigned FTEs are working on other value-adding projects that would have otherwise required new hires.

Table 7
Reduced IT Operations Team Size

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
G1	Cumulative number of IT FTEs reassigned		3	4	4
G2	Cumulative number of avoided FTE additions		2	3	4
G3	Annual fully burdened cost	=A1	$125,000	$125,000	$125,000
Gt	Reduced IT operations team size	(G1+G2)*G3	$625,000	$875,000	$1,000,000

Source: Forrester Research, Inc.

Total Benefits
Table 10 shows the total quantified benefits realized by implementing Oracle Exadata/Exalogic.

Table 10
Total Benefits, Non-Risk-Adjusted

Ref.	Benefits	Year 1	Year 2	Year 3	Total
Et	Eliminated hardware and maintenance costs	$234,112	$35,712	$35,712	$305,536
Ft	Revenue protection	$1,854,545	$1,854,545	$1,854,545	$5,563,636
Gt	Reduced IT operations team size	$625,000	$875,000	$1,000,000	$2,500,000
	Total	$2,713,657	$2,765,257	$2,890,257	$8,369,172

Source: Forrester Research, Inc.

Improved System Performance (Unquantified)
The revenue protection benefit described above is partly a byproduct of increased system performance. The improved system performance delivered by Oracle Exadata/Exalogic also has many other tangible benefits that could not be quantified for this study. These include increased business user productivity, new revenue opportunities, deferred hardware upgrades, and IT operations team peace of mind, to name a few.

Square Two Financial spoke at length about how eAGLE system performance has improved. Observations included:

- "When we began the project, our eAGLE Performance Index (EPI) — a weighted average of the top 13 screens' performance — was in the 60s and the load time was 3.7 seconds. Since implementing Exadata and Exalogic, system performance has more than doubled. Our EPI has increased to 130 and load time has decreased by more than 60%. All this was accomplished while more than doubling the number of users."
- "Database access times have dramatically improved, from an average of 700 milliseconds to 200 milliseconds."
- "From a revenue creation standpoint, we look at collectors' performance in clicks per day. This has increased from 200 to 400, meaning that workers at the law firms are able to liquidate more debt."

Readers are strongly encouraged to consider how improved system performance can affect business processes, revenue generation, and other business benefits. These should be factored into any cost benefit analysis on implementing Oracle Exadata and Oracle Exalogic.

Improved Analytics (Unquantified)

Implementing Oracle Exadata and Oracle Exalogic provides business users with much better and more timely access to critical information. This information has been used to identify new business opportunities, improve sales closure rates, and operate more efficiently. "Our analytics has substantially improved. This is core to what we do as a company and is an enormous benefit. Some of our projects have looked at how we pursue certain debt classes and resulted in a closure lift from 23% to 28% in some areas. This directly results in increased revenue."

Flexibility

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement Oracle Exadata and Oracle Exalogic and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Deploying eAGLE on Oracle Exadata and Oracle Exalogic has provided greater business flexibility to Square Two Financial as described in the benefits section above. The flexibility improvements include providing the IT team more time to focus on accretive activities, bringing new and improved services to market more quickly, and easily supporting rapid growth.

Square Two Financial is planning to upgrade its deployment of Oracle Exalogic from X2 to X3. This will provide additional benefits such as reduced development costs, more rapid refresh of development environments, and the ability to use virtualization. Virtualization will further improve the eAGLE system performance. None of these flexibility benefits were included in the ROI analysis.

Risk

Forrester defines two types of risk associated with this analysis: implementation risk and impact risk. "Implementation risk" is the risk that a proposed investment in Oracle Exadata and Oracle Exalogic may deviate from the original or expected requirements, 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 investment in Oracle Exadata and Oracle Exalogic, 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 and impact risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as "realistic" expectations, as they represent the expected values considering risk.

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

- **Size of the deployment.** A larger deployment can take more time to implement increasing internal labor costs and professional services.
- **Breadth of Oracle usage.** A company that uses a range of Oracle products may be able to negotiate better prices as part of a wide-ranging enterprise agreement than a company using only Oracle Exadata/Exalogic.

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

- **IT operations team size.** Depending on the previous size of the IT operations team and the anticipated growth, the number of FTEs saved may be larger or smaller than the savings depicted in this study.
- **Revenue protection.** If the systems being deployed on Oracle Exadata and Oracle Exalogic are not related to revenue generation, this benefit may not apply. Readers are encouraged to identify other business benefits derived from deploying their mission-critical application on Oracle Exadata/Exalogic.

Table 11 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first estimate the low, most likely, and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Table 11
Cost And Benefit Risk Adjustments

Costs	Low	Most likely	High	Mean
Implementation internal labor costs: medium risk	100%	100%	115%	105%
Professional services costs: low risk	98%	100%	105%	101%
Oracle hardware, software licenses, and support costs: low risk	98%	100%	105%	101%
Benefits	**Low**	**Most likely**	**High**	**Mean**
Eliminated hardware and maintenance costs: low risk	90%	100%	105%	98%
Revenue protection: high risk	50%	100%	100%	83%
Reduced IT operations team size: medium risk	80%	100%	103%	94%

Source: Forrester Research, Inc.

Square Two Financial felt that using Oracle Exadata and Oracle Exalogic actually reduced risk. This is because of better uptime and the ability to complete all business analytics before the next work day.

Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the return on investment, net present value, and payback period for the organization's investment in Oracle Exadata and Oracle Exalogic. These are shown in Table 12 below.

Table 12
Cash Flow — Non-Risk-Adjusted

Cash flow — Original estimates						
	Initial	Year 1	Year 2	Year 3	Total	Present value
Costs	($2,412,292)	($193,200)	($193,200)	($193,200)	($2,991,892)	($2,892,751)
Benefits		$2,713,657	$2,765,257	$2,890,257	$8,369,172	$6,923,791
Net benefits	($2,412,292)	$2,520,457	$2,572,057	$2,697,057	$5,377,281	$4,031,040
ROI	139%					
Payback period	12 months					

Source: Forrester Research, Inc.

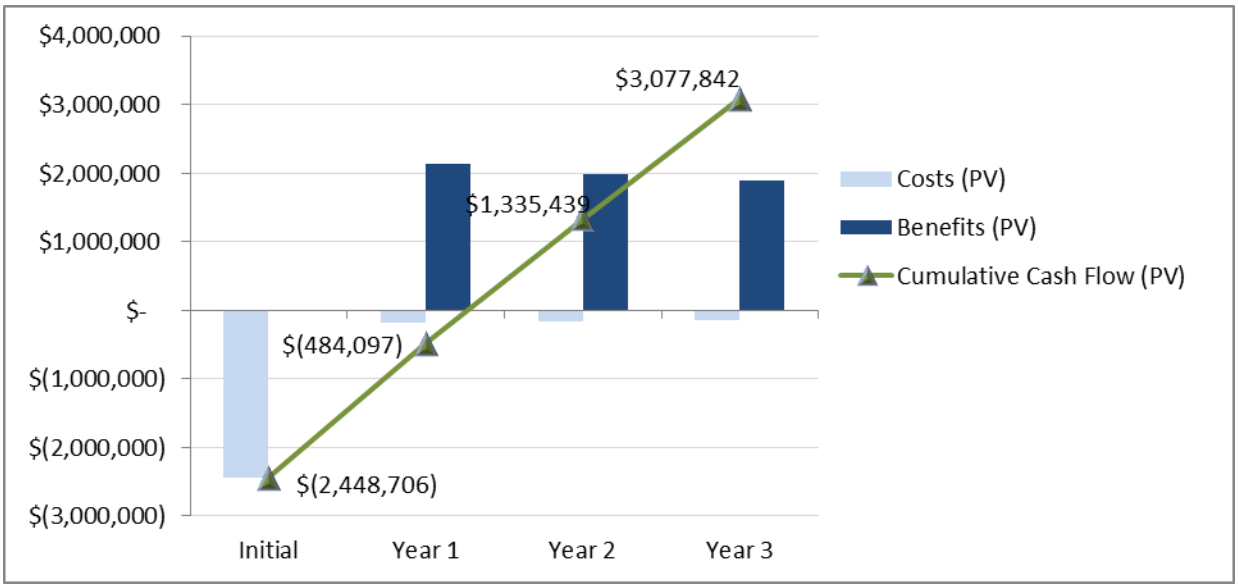
Table 13 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 11 in the Risk section to the cost and benefits numbers in Tables 6 and 10.

Table 13
Cash Flow — Risk-Adjusted

Cash flow — Risk-adjusted estimates						
	Initial	Year 1	Year 2	Year 3	Total	Present value
Costs	($2,448,706)	($195,132)	($195,132)	($195,132)	($3,034,102)	($2,933,971)
Benefits		$2,356,202	$2,396,770	$2,514,270	$7,267,243	$6,011,813
Net benefits	($2,448,706)	$2,161,070	$2,201,638	$2,319,138	$4,233,141	$3,077,842
ROI	105%					
Payback period	14 months					

Source: Forrester Research, Inc.

Figure 3
Three-Year Risk-Adjusted Cash Flow



Source: Forrester Research, Inc.

Oracle Exadata And Oracle Exalogic: Overview

Oracle Exadata and Oracle Exalogic are two key members of the Oracle Engineered Systems family. Oracle Engineered Systems are preconfigured, optimized systems consisting of Oracle's latest software and hardware engineered to work together. They are designed for maximum interoperability and performance.

Oracle Exadata

According to Oracle, Oracle Exadata combines massive memory and low-cost disks to deliver high performance and scalability at the low cost. It is a database platform well suited for the varied and unpredictable workloads of cloud computing. Oracle Exadata systems leverage next-generation technologies to deliver significant improvements, including up to 40% faster response times, up to 30% reduction in power and cooling, and the ability to store and manage hundreds of terabytes of data entirely in flash memory.

Features & Benefits include:

- Oracle Database
- Oracle Exadata Smart Scan
- Oracle Exadata Smart Flash Cache
- Oracle Exadata Hybrid Columnar Compression
- InfiniBand network
- Petabyte scalability

Oracle Exalogic

Oracle describes Oracle Exalogic as hardware and software engineered together to provide extreme performance, reliability, and scalability for Oracle, Java, and other applications, while delivering lower total cost of ownership, reduced risk, higher user productivity, and one-stop support. It is designed, optimized, and certified for running Oracle and third-party applications.

Oracle Exalogic provides:

- Fully integrated compute nodes, storage and networking
- Mission-critical virtualization for true application isolation
- Complete management from applications to disk
- Automated application deployment process
- Load balancing via a built-in application delivery controller

Appendix A: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research 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: benefits, costs, risks, and flexibility.

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 form 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 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 B: 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 respective organization 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. The point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's 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 Years 1 through 3 are discounted using the discount rate (shown in Framework Assumptions section) 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.

Table [Example]
Example Table

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

Source: Forrester Research, Inc.

Appendix C: Endnotes

[1] Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates.