A Forrester Total Economic Impact™ Study Prepared For Oracle

The Total Economic Impact Of Oracle Data Masking

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# TABLE OF CONTENTS

Executive Summary.................................................................................................................. 2

Oracle Data Masking Pack Improves IT Productivity And Enterprise Security......................... 2

Factors Affecting Benefits And Costs...................................................................................... 4

Disclosures.................................................................................................................................. 4

TEI Framework And Methodology............................................................................................ 5

Analysis..................................................................................................................................... 6

Interview Highlights................................................................................................................. 6

Costs.......................................................................................................................................... 7

Benefits...................................................................................................................................... 10

Unquantified Benefits............................................................................................................... 14

Flexibility.................................................................................................................................. 15

Risk........................................................................................................................................... 16

Financial Summary.................................................................................................................. 18

Oracle Data Masking: Overview.............................................................................................. 20

Benefits...................................................................................................................................... 20

Appendix A: Composite Organization Description.................................................................. 21

Appendix B: Total Economic Impact™ Overview.................................................................... 22

Appendix C: Glossary................................................................................................................ 23

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Executive Summary

In June 2013, Oracle commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) that enterprises may realize by implementing Oracle Data Masking Pack, part of Oracle’s portfolio of database security and application quality management solutions. Oracle Data Masking Pack is shipped with Oracle Enterprise Manager 12c.

Forrester conducted in-depth interviews with executives from four customers that implemented Oracle Data Masking Pack in their organizations. The purpose of this study is to give readers a framework to evaluate the potential financial impact of using Oracle Data Masking Pack.

Oracle Data Masking Pack helps organizations comply with data privacy and protection mandates and laws that restrict the use of personally-identifiable or other protected customer data. With Oracle Data Masking Pack, sensitive information such as credit card or social security numbers can be replaced with realistic values, allowing production data to be safely used in application development, testing, or sharing with outsourced or offshore partners for other nonproduction purposes.

Oracle Data Masking Pack Improves IT Productivity And Enterprise Security

Total Economic Impact (TEI) is a standard methodology developed by Forrester Research that captures and quantifies the voice of the customer relative to technology investments. In this study, we interviewed four Oracle customers individually about each organization’s experience in implementing Oracle Data Masking Pack solutions. These organizations needed an enterprise-level data solution and were challenged by the volume of data and level of decentralization that characterized their organizations. One interviewed organization evaluating the option to develop in-house found that Oracle Data Masking Pack provided the simplest and most cost-effective solution. Another organization with internally-developed scripts found that their existing solutions could not provide the level of consistency and efficiency that Oracle Data Masking Pack brought.

Forrester’s interviews and subsequent financial analysis determined that a composite organization based on the organizations we interviewed would expect to experience a risk-adjusted ROI of 242% with a payback period of 5.4 months, based on the costs and benefits summarized in Table 1. For non-risk adjusted ROI figures, see Table 11. See Appendix A for a description of the composite organization.

<table>
<thead>
<tr>
<th>ROI</th>
<th>Payback period</th>
<th>Total benefits (PV)</th>
<th>Total costs (PV)</th>
<th>Net present value (NPV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>242%</td>
<td>5.4 months</td>
<td>$1,616,709</td>
<td>($472,618)</td>
<td>$1,144,091</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
• **Benefits.** The composite organization achieved the following benefits that represent those experienced by the interviewed companies:

  - Increased productivity of IT staff by 40% through automating the discovery and masking of sensitive data. This automation of manual processes saved the composite organization $1,235,520 (risk-adjusted over three years) in DBA productivity.
  - Reduction in internal development, testing, and maintenance costs by a factor of 10%. This represents productivity savings of $498,960 (risk-adjusted over three years) for the composite organization.
  - Cost avoidance savings of $9,653 (risk-adjusted over three years for troubleshooting a legacy masking solution.
  - Improved security and direct cost avoidance in the event of a security breach.
  - Increased ability to meet business needs and customer requirements by reducing the time it takes to mask data by at least 86%.
  - Improved compliance with consistent and automatic enforcement of policies across all enterprise data.
  - Improved reliability of data masking processes

**Figure 1**
Benefits of Oracle Data Masking

![Benefits by Category (Risk-Adjusted)](chart)

Source: Forrester Research, Inc.
• **Costs.** The organizations we interviewed incurred the following costs:
  
  - Oracle Data Masking Pack software and maintenance fees.
  - Internal labor costs for implementation.
  - Training costs.

**Factors Affecting Benefits And Costs**

Table 1 above illustrates the risk-adjusted financial results that the composite organization described in Appendix A would expect. The risk-adjusted values take into account 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 environment prior to engaging Oracle Data Masking. Organizations in a greenfield environment that had no homegrown legacy masking solution should expect to see higher ROI from an Oracle Data Masking Pack investment. This higher benefit will come from avoiding the cost of developing and maintaining an internal data masking solution.

- The variability in the size of deployment and the level of assessed impact of a security breach to the organization.

**Disclosures**

The reader should be aware of the following:

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

- Forrester makes no assumptions as to the potential ROI that other organizations will receive. 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 Data Masking Pack software.

- 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.

- Oracle provided the customers for the interviews.
TEI Framework And Methodology

Introduction
From the information provided in the interviews, Forrester has constructed a TEI framework for those organizations considering engaging Oracle Data Masking. The objective of the framework is to identify the costs, benefits, flexibility, and risk factors that affect the investment decision. TEI is a standard methodology developed by Forrester Research that enhances an organization’s technology decision-making processes.

Approach And Methodology
Forrester took a multistep approach to evaluate the economic impact that Oracle Data Masking Pack can have on an organization (see Figure 1). Specifically, we:

- Interviewed Oracle product management and marketing executives and Forrester Research analysts to gather data relative to data security and the database management system (DBMS) market in general.
- Interviewed four organizations currently using Oracle Data Masking Pack to obtain data with respect to costs, benefits, risks, and flexibility.
- Designed a composite organization based on characteristics of the interviewed organizations (see Appendix A).
- 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

Forrester employed four fundamental elements of TEI in modeling the financial implications of using Oracle Data Masking:

1. Costs.
2. Benefits to the entire organization.
3. Flexibility.
4. Risk.
Forrester’s TEI methodology provides a complete picture of the total economic impact of technology investment decisions. Please see Appendix B for additional information on the TEI methodology.

**Analysis**

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

1. A leading provider of consumer products and services over the Internet.
2. A North American financial services firm supporting a large partner network of financial firms.
3. A major university in the US with more than 14 colleges.
4. A Fortune 500 multinational corporation in the technology industry.

These interviews uncovered a number of important insights about customer organizations’ experience with Oracle Data Masking:

- Among the organizations interviewed, different factors drove the investment in Oracle Data Masking. One organization had expanded its application development team into India and needed to provide QA and development environments that did not contain sensitive HR data to these remote teams. Another organization had experienced a data breach that initiated a data masking and laptop encryption initiative to contain sensitive information in its decentralized environment. The manager for IT security and compliance at one financial services firm stated, “Our goal with working with Oracle Data Masking Pack was to supply enough resources to provide fluent transactions for our platform.”

- Common themes among the interviewees were the need for an enterprise-level data solution and the challenge of volume and decentralization across these large organizations.

- Organizations that were contemplating building a data masking solution in-house found that, after evaluation, this would be too costly as an alternative to working with Oracle. One company also added, “We looked at doing it in-house, but when it came down to what the business was asking us to do, Oracle Data Masking Pack was the simplest solution.” Those that had a legacy internally-developed solution, or were relying on manual scripts, found that their existing solutions could not provide the consistency or efficiency that they needed for their requirements.

- Companies interviewed also touched on the ease of implementation, with change management and the establishment of processes making up the bulk of the work versus the actual implementation. They also talked about the ease of use of Oracle Data Masking Pack software, with one data operations manager stating that “it was all hands-off once we were there.”
• One company touched on the strategic partnership it had with Oracle as a factor in its decision saying, “We knew that we had an existing relationship that we could leverage.” Oracle worked closely with them and came on site for the implementation. Their manager for IT security and compliance stated, “Oracle’s familiarity with our environment really helped make it a more turnkey implementation.”

**Composite Organization**

Based on interviews with four Oracle Data Masking Pack customers, Forrester constructed a TEI framework, a composite organization, *Nedcan Solutions*, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results is a global provider of consumer products and services over the Internet with 5,000 employees and more than $1 billion in annual revenue. The composite organization is managing over 2,500 database instances. The composite organization had a legacy masking solution; scripts were developed internally. This solution was neither complete nor efficient enough to meet the application development requirements for its growing customer base. *Nedcan Solutions* implemented Oracle Data Masking Pack with a goal of rolling out an enterprise-level data solution to meet its needs. Please see Appendix A for a more detailed description of the composite organization.

**Framework Assumptions**

The discount rate used in the present value (PV) and net present value (NPV) calculations is 10%; 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. Other assumptions are shown in later tables.

**Costs**

The main costs associated with a deployment of Oracle Data Masking Pack are: 1) software license and maintenance fees; 2) implementation costs; and 3) training costs. The following are the cost inputs to the financial analysis:

**Oracle Data Masking Pack license fees and maintenance.**

*Nedcan Solutions* deployed Oracle Data Masking Pack software to 30 processors at a cost of $276,000 in software license fees. Maintenance fees starting from Year 1 are $60,720 annually.


Table 2
License Fees And Maintenance

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Oracle Data Masking Pack license fees</td>
<td></td>
<td>$276,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Maintenance fees</td>
<td>A1*22%</td>
<td>$60,720</td>
<td>$60,720</td>
<td>$60,720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At</td>
<td>Oracle Data Masking Pack license and fees</td>
<td></td>
<td>$276,000</td>
<td>$60,720</td>
<td>$60,720</td>
<td>$60,720</td>
<td>$458,160</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

The license and maintenance fees in this study assume that the sample Organization purchased and deployed Oracle Data Masking Pack at a normal discount from Oracle as of June 2013. Other organizations may incur different prices; therefore, they should contact their Oracle sales representative or the Oracle Store http://shop.oracle.com. Forrester makes no assumption that other organizations will achieve similar results as those cited in the study.

Implementation Costs: Internal Labor Costs

Organizations interviewed that lacked standard processes for data masking, relying instead on decentralized scripting methods, reported longer implementation times for Oracle Data Masking. One organization built a brand-new process to determine responsibilities for management and ownership of the database as well as to address risk management concerns. Another organization with a very decentralized structure had to ask nine functional leads to commit 220 hours each to the effort, apart from the full-time work of three database administrators (DBAs). This educational institution estimated that total cost for their Oracle Data Masking implementation was $170,000. Each organization, at whatever level of pre-Oracle Data Masking Pack environment, worked with a team of two to three dedicated resources.

Nedcan Solutions deployed two resources from its DBA team with part-time assistance from its data architects. Over the course of three months, these resources spent 40% of their time on the project. The majority of the work involved building the data models, testing, and change management. Actual installation took one day. At a fully-loaded annual compensation of $130,000, the total implementation cost to the composite organization is $32,500. Table 3 summarizes these results.
Table 3
Oracle Data Masking Pack Implementation Costs: Internal Labor

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Per period</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Number of people</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>A2</td>
<td>Fully-loaded hourly rate per person</td>
<td>$130,000/2,080 hours</td>
<td>$62.50</td>
</tr>
<tr>
<td>A3</td>
<td>Hours</td>
<td>(3/12)<em>2,080 hrs</em>40%</td>
<td>208</td>
</tr>
<tr>
<td>At</td>
<td>Implementation costs: internal labor</td>
<td>A1<em>A2</em>A3</td>
<td>$32,500</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Training Costs
Half of the organizations interviewed had their teams undergo training around the new data masking processes. The composite organization’s 48-person team of DBAs and developers spent 2.5 hours each in training. Nine hours were also spent to develop training for the team. At a fully loaded blended hourly rate of $54.49, the total training cost to the organization is $7,029.

Total Costs
Total costs for the composite organization’s deployment of Oracle Data Masking Pack are shown in the following table.

Table 4
Total Costs (Non-Risk-Adjusted)

<table>
<thead>
<tr>
<th>Costs</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software license fees</td>
<td>($276,000)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>($276,000)</td>
</tr>
<tr>
<td>Software maintenance fees</td>
<td>$0</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($182,160)</td>
</tr>
<tr>
<td>Implementation costs: internal labor</td>
<td>($32,500)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>($32,500)</td>
</tr>
<tr>
<td>Training fees</td>
<td>($7,029)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>($7,029)</td>
</tr>
<tr>
<td>Total</td>
<td>($315,529)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($497,689)</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
Benefits

“We have an upstream and downstream system which makes it very hard to mask data. And the question you then have to ask is who is managing these scripts for 3,000 or 4,000 systems. Who has ownership?” (Database administrator, Fortune 500 technology organization)

In interviews with Oracle customers, Forrester identified several benefits of implementing Oracle Data Masking. These quantified benefits include: 1) increased productivity by automating the discovery and masking of sensitive data; 2) reduction in internal development, testing and maintenance costs; 3) cost avoidance of troubleshooting a legacy solution; and 4) improved security and direct cost avoidance in the event of a security breach.

Other benefits noted by the customers but not quantified in the study include: 1) increased flexibility to meet business needs 2) improved compliance with consistent and automatic enforcement of policies across all enterprise data; and 3) improved reliability.

*Increased DBA Productivity Through Automating The Discovery And Masking Of Sensitive Data*

“We’ve removed the old process and replaced it with the standardized data process today. Before Oracle Data Masking, there were a lot of man-hours because of nonstandard data masking. Now those man-hours are gone and the efficiency is higher.” (Database administrator, Fortune 500 technology organization)

The organizations interviewed turned to Oracle Data Masking Pack in their search for an enterprise-level data solution. For some, the management and maintenance of thousands of scripts in disparate systems throughout their organization was burdensome and ineffective. For others, building a data masking system in-house was too expensive; even if one was built, it could not address the volume of demand from their organization’s growth.

Organizations with an internally developed solution reported that automating the discovery and masking of sensitive data through Oracle Data Masking Pack improved the productivity of their DBAs by 20%. Organizations without internally-developed masking systems could stand to save between 50% to 70% of their time writing and maintaining masking scripts and providing data for compliance reporting through the automation provided through data masking software. One organization that had no internally developed solution in place estimated that setting up a manual system would have cost it at least $400,000 for development and implementation, not including system maintenance or the lost opportunity cost of their IT staff focusing on this project instead of other business initiatives.

By implementing Oracle Data Masking, the composite organization realized productivity savings of 40% for 16 DBAs, including those from business intelligence and data management and integration systems, as well as data warehouse and enterprise architects. *Nedcan Solutions* was replacing its internally-developed solution based on algorithms that shifted data to the more precise data masking and scrubbing provided through the Oracle Data Masking Pack solution. The average fully loaded compensation per DBA FTE at *Nedcan Solutions* is estimated at $130,000 per year. Forrester conservatively estimates that 40% of that time savings is captured for productive work. The total productivity gains through automation are approximately $1,248,000 over a three-year period.
Table 5
Improved DBA Productivity Through Automation

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Number of database administrators</td>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>Annual fully-loaded rate per person</td>
<td>$130,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>Productivity improvement</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B4</td>
<td>Percentage of time savings converted into productive work</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bt</td>
<td>Productivity savings</td>
<td>B1<em>B2</em>B3*B4</td>
<td>$416,000</td>
<td>$416,000</td>
<td>$416,000</td>
<td>$1,248,000</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Reduction In Internal Development, Testing, And Maintenance Costs By A Factor Of 10%

“We’ve seen improved overall time, not just for the DBA team but also for the development and testing teams. Oracle Data Masking Pack is an invaluable piece of the platform from that perspective.” (Manager of IT security and compliance, financial services firm)

From the data gathered from the interviewed organizations, IT cost reduction through Oracle Data Masking Pack can be viewed through two categories: DBA cost savings and developer cost savings. Organizations that had developed masking scripts internally all cited the burden of the hours spent maintaining these scripts, especially when there were script changes and management policy changes. As one organization stated, “you can’t overemphasize the efficiency of the product itself. With our previous system, data relationships could not be maintained. Oracle Data Masking Pack makes it a whole lot easier for our testing teams. Now we have all that time saved from replicating environments.”

IT cost savings from Oracle Data Masking Pack also included application development cost savings. For one organization, the time it took to create scrubbed and masked data for development environments was reduced from two weeks to two days. This organization reported that the speed to provide development environments with Oracle Data Masking Pack improved productivity in its development and testing teams by 10%. This was especially critical to the organization, as it had shifted to an Agile development model with a release every two weeks as opposed to every six months. Another organization reported that it could now produce dev and QA instances overnight with Oracle Data Masking, compared with three or four weeks in a manual environment.

DBA productivity savings for Nedcan Solutions were quantified in the previous benefit category. Apart from DBA cost savings, Nedcan Solutions was able to provide development environments faster to its development and testing teams, thus saving these workers time and improving their productivity by 10%. Forrester conservatively estimates that 50% of that time savings is captured for productive work. There are 22 people in the development team and 10 people in testing. At an average fully-loaded compensation of $105,000 per year, the reduction in internal development, testing, and maintenance costs for the composite organization are valued at $504,000 over three years.
Table 6
Reduction In Internal Development, Testing, And Maintenance Costs

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Number of workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Annual fully-loaded rate per person</td>
<td>$105,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>Productivity improvement</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td>Percentage of time savings converted into productive work</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ct</td>
<td>IT productivity savings</td>
<td>C1<em>C2</em>C3*C4</td>
<td>$168,000</td>
<td>$168,000</td>
<td>$168,000</td>
<td>$504,000</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

By replacing its internally developed masking solution with the more effective Oracle Data Masking Pack software, the composite organization also eliminated the resource time spent on administering its in-house developed solution. *Nedcan Solutions* allocated 5% of one FTE for this work. At a fully-loaded annual compensation of $130,000 per FTE, the cost avoidance of troubleshooting its previous internally developed solution is quantified at $9,750 over the three years of the analysis.

Table 7
Avoiding The Cost Of Maintaining The Previous Internally Developed Masking Solution

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Number of workers</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>Annual fully-loaded rate per person</td>
<td>$130,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>Productivity improvement</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4</td>
<td>Percentage of time savings converted into productive work</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dt</td>
<td>Avoided cost of maintaining the previous solution</td>
<td>D1<em>D2</em>D3*D4</td>
<td>$3,250</td>
<td>$3,250</td>
<td>$3,250</td>
<td>$9,750</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
**Improved Security And Direct Cost Avoidance In The Advent Of A Security Breach**

All the organizations interviewed cited improved security and compliance as a benefit of their Oracle Data Masking Pack implementation. As the SVP of data operations for one Fortune 500 technology company noted, “With Oracle Data Masking, senior management is happy and the development team can do its work. Now there is no concern that data is being leaked.” A number of the interviewed organizations noted the direct cost avoidance in the event of a security breach as a result of this improved security. One organization that had experienced a data breach which occurred when a laptop with sensitive data on it was stolen, noted that its implementation of Oracle Data Masking Pack post-breach was about “opportunity cost saving and risk negation.” This organization estimated that it had spent $1 million to $2 million to remediate the data breach, including the setup of a call center and the time spent by the data operations, risk management, and executive teams dealing with the repercussions of this incident. Another company interviewed estimated that it risks losing $200 million in the event of a data breach, not just in terms of remediation but also in loss of new business.

The Forrester TEI methodology for quantifying risk of loss considers the amount of potential exposure/loss, assumes a frequency of exposure/loss, and estimates the probability of exposure/loss to arrive at a value to be included in the financial model. For the composite organization, the cost avoidance of a security breach as a benefit of Oracle Data Masking Pack is conservatively quantified as a function of remediation instead of revenue loss. This remediation cost is valued at $2 million. The probability of exposure is conservatively estimated at a 10% chance that an incident will occur during the three years. The cost avoidance value of a security breach as a result of data masking is quantified for the TEI financial model at $200,000 over three years. Readers of this study are encouraged to use their own assumptions for value of potential exposure, frequency, and probability.

**Table 8**

Cost Avoidance From A Security Breach

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Potential exposure</td>
<td></td>
<td>$2,000,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td>Probability of exposure</td>
<td></td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Et</td>
<td>Cost avoidance with reduction of risk</td>
<td>E1*E2</td>
<td>$200,000</td>
<td></td>
<td></td>
<td>$200,000</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

**Total Benefits**

Table 9 summarizes the quantified benefits from an investment in Oracle Data Masking Pack for the composite organization.
Table 9
Total Benefits (Non-Risk-Adjusted)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased productivity by automating the discovery and masking of sensitive data</td>
<td>$416,000</td>
<td>$416,000</td>
<td>$416,000</td>
<td>$1,248,000</td>
<td></td>
</tr>
<tr>
<td>Reduction in internal development, testing, and maintenance costs</td>
<td>$168,000</td>
<td>$168,000</td>
<td>$168,000</td>
<td>$504,000</td>
<td></td>
</tr>
<tr>
<td>Cost avoidance of troubleshooting legacy solution</td>
<td>$3,250</td>
<td>$3,250</td>
<td>$3,250</td>
<td>$9,750</td>
<td></td>
</tr>
<tr>
<td>Direct cost avoidance in the event of a security breach</td>
<td>$200,000</td>
<td>$0</td>
<td>$0</td>
<td>$200,000</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$787,250</td>
<td>$587,250</td>
<td>$587,250</td>
<td>$1,961,750</td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Unquantified Benefits
Other qualitative benefits cited by the customers interviewed, but not quantified in this study, include the following.

*Increased Flexibility To Meet Business Needs*
By implementing Oracle Data Masking Pack, organizations were able to meet the risk requirements of their business in a timely manner. One organization noted, “We looked at doing it in-house, but when it came to what the business was asking us to do, Oracle Data Masking Pack was the simplest solution.” One organization’s Oracle Data Masking Pack implementation reduced the time it took to prepare development environments from two weeks to two days. The organization’s application delivery cycle became faster and its processes more agile with this 86% reduction in delivery time. Another organization reported that delivering QA and development instances went from three to four weeks down to an overnight process.

*Improved Compliance With Consistent And Automatic Enforcement Of Policies Across All Enterprise Data*

“We’re now able to give assurance to senior management that data is protected. Oracle Data Masking Pack solved our problem quickly and efficiently.” (SVP of data operations, Internet product and services company)

Customers interviewed also noted that their previous solutions (internally developed masking solutions or manual scripts) did not fully meet the masking requirements for data across their respective organizations. One company noted that its in-house developed solution only used an algorithm to shift data and with Oracle it now had “true masking and data scrubbing.” These organizations valued the standardized processes that Oracle Data Masking Pack enforced to reduce access to production data. This especially benefited organizations that were decentralized. As the assistant director for data operations at one organization observed, “It’s hard to make a decree for every developer across campus. That’s why we said, let’s mask and reduce our exposure.”
These customers also benefited from the improved reporting within the Oracle Data Masking Pack software to demonstrate compliance. The audit trail for activity logs available with Oracle Data Masking Pack makes it easier for organizations to show that they are consistently and automatically enforcing policies across the enterprise. Use of Oracle software also provides credibility to company partners and regulators. As one organization asserted, “It helps our sales group when we work with external parties. It’s a lot easier to demonstrate compliance — to show that we don’t just do it 90% of the time, we apply masking universally. That’s big.”

**Improved Reliability Of Data Masking Process**
Reliability was also another area of benefit cited by a number of the organizations interviewed. The consistent results from the automated masking processes helped ensure that “the frustration level went lower and is now zero” in terms of reconciling data for these organizations’ data operations, data risk, and analyst teams.

**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 ability to engage in future initiatives, but not the obligation to do so. From our interviews, we’ve found that there are scenarios in which a customer deployed Oracle Data Masking Pack now and later realizes additional uses and business opportunities.

Although data for calculating the value of these flexibility options was insufficient when this study was conducted, our interviews as well as Forrester research identified areas that could produce flexibility options based on real next-stage options. These include:

- **Oracle Data Masking Pack Software**: is efficient, as it optimizes processes that can potentially reduce the consumption on system resources. Better system resource utilization could be a source of hardware cost savings for these organizations in the future, as it could potentially defer hardware upgrades.

- **Putting additional systems through Oracle Data Masking Pack**: would also bring additional future benefits to these organizations. As one organization’s assistant director for data operations stated, “If we have another system we have to mask, we have that foundation in place. It’s just a matter of identifying elements and algorithm. We now have the components, infrastructure, and team.”

- **Reversible data masking**: was also identified by some of the organizations interviewed as another future benefit. Reversible data masking gives organizations the ability to get to the original data from masked data if needed for validation or any other business requirement.

- **Reproducible business data**: can be provided to offshore third-party companies or used for other purposes. The third party does not see the sensitive elements because the data is masked; the third party can manipulate it masked and then return it to the organization to be converted back into the original data for internal checks, validations, or other business requirements.
• An additional investment in a data masking format library, which serves as a central repository, may provide future DBA productivity savings. Organizations don’t need to build new masked formats; they can leverage their investment in the library as these are reusable elements.

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

**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 Data Masking Pack 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 Data Masking, 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 impact risks 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 risk that affects costs has been identified as part of this analysis:

• Internal labor for implementation and time spent on training may increase from initial estimates in such areas as data model building, change management, and database upgrades.

The following impact risks that affect benefits have been identified as part of this analysis:

• Variability in DBA and developer productivity savings, depending on the IT environment prior to Oracle Data Masking Pack being in place.

• Variability in organizations’ quantification of cost of a security data breach.

Table 10 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 10
Cost And Benefit Risk Adjustments

<table>
<thead>
<tr>
<th>Costs</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Data Masking Pack software license fees</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Oracle Data Masking Pack software maintenance fees</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Implementation costs: internal labor</td>
<td>100%</td>
<td>100%</td>
<td>150%</td>
<td>117%</td>
</tr>
<tr>
<td>Training fees</td>
<td>100%</td>
<td>100%</td>
<td>125%</td>
<td>108%</td>
</tr>
<tr>
<td>Benefits</td>
<td>Low</td>
<td>Most likely</td>
<td>High</td>
<td>Mean</td>
</tr>
<tr>
<td>Increased productivity by automating the discovery and masking of sensitive data</td>
<td>92%</td>
<td>100%</td>
<td>105%</td>
<td>99%</td>
</tr>
<tr>
<td>Reduction in internal development, testing and maintenance costs</td>
<td>92%</td>
<td>100%</td>
<td>105%</td>
<td>99%</td>
</tr>
<tr>
<td>Cost avoidance of troubleshooting legacy solution</td>
<td>92%</td>
<td>100%</td>
<td>105%</td>
<td>99%</td>
</tr>
<tr>
<td>Direct cost avoidance in the event of a security breach</td>
<td>80%</td>
<td>100%</td>
<td>103%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Source: ForresterResearch, Inc.
Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the ROI, NPV, and payback period for the organization’s investment in Oracle Data Masking Pack. These are shown in Table 11.

**Table 11**
Cash Flow: Non-Risk-Adjusted

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>($315,529)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($497,689)</td>
<td>($466,530)</td>
</tr>
<tr>
<td>Benefits</td>
<td>$787,250</td>
<td>$587,250</td>
<td>$587,250</td>
<td>$1,961,750</td>
<td>$1,642,222</td>
<td></td>
</tr>
<tr>
<td>Net benefits</td>
<td>($315,529)</td>
<td>$726,530</td>
<td>$526,530</td>
<td>$526,530</td>
<td>$1,464,061</td>
<td>$1,175,692</td>
</tr>
<tr>
<td>ROI</td>
<td>252%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback period</td>
<td>5.2 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Table 12 shows the risk-adjusted ROI, NPV, and payback period. These values are determined by applying the risk adjustment values from Table 10 in the Risk section to the cost and benefits numbers in Tables 4 and 9.

**Table 12**
Cash Flow: Risk-Adjusted

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>($321,616)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($60,720)</td>
<td>($503,776)</td>
<td>($472,618)</td>
</tr>
<tr>
<td>Benefits</td>
<td>$769,378</td>
<td>$581,378</td>
<td>$581,378</td>
<td>$1,932,133</td>
<td>$1,616,709</td>
<td></td>
</tr>
<tr>
<td>Net benefits</td>
<td>($321,616)</td>
<td>$708,658</td>
<td>$520,658</td>
<td>$520,658</td>
<td>$1,428,356</td>
<td>$1,144,091</td>
</tr>
<tr>
<td>ROI</td>
<td>242%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback period</td>
<td>5.4 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
The data collected in this study indicates that deploying the Oracle Data Masking Pack solution has the potential to provide a solid ROI through quantifiable benefits from improved DBA productivity, internal IT cost reduction, as well as cost avoidance of a security breach. The risk-adjusted ROI of 242%, along with a 5.4 month payback period (break-even point), raises confidence that the investment is likely to produce a positive outcome, especially after the risks and uncertainty that may affect the project have been considered, quantified, and incorporated into the business case.
Oracle Data Masking: Overview

According to Oracle, Oracle Data Masking Pack is a part of Oracle’s comprehensive portfolio of database security and application quality management solutions and is shipped with Oracle Enterprise Manager 12c. The Pack helps organizations comply with data privacy and protection mandates such as Sarbanes-Oxley (SOX), the Payment Card Industry (PCI) Data Security Standard (DSS), the Health Insurance Portability and Accountability Act (HIPAA), and numerous laws that restrict the use and sharing of actual private, confidential or sensitive data. With Oracle Data Masking, sensitive information such as credit card or social security numbers can be replaced with realistic values, allowing production data to be safely used for development, testing, or sharing with outsourced or offshore partners for other nonproduction purposes. Oracle Data Masking Pack uses a library of templates and format rules, consistently transforming data in order to maintain referential integrity for applications.

Benefits

- **Ensure compliance of your enterprise data.** Use production data freely in nonproduction environments without violating data privacy regulations or risking sensitive data leaks.

- **Save time and increase security with data masking policies.** Security administrators define the masking rules once, which are then automatically applied every time the database administrator masks the database.

- **Address regulatory requirements.** De-identifying sensitive data is increasingly being called out as critical technology in data privacy protection laws globally.
Appendix A: Composite Organization Description

Based on the interviews with existing Oracle Data Masking Pack customers, Forrester constructed a TEI framework, a composite company called Nedcan Solutions, and an associated ROI analysis that illustrates the areas affected financially. The composite organization that Forrester synthesized from these results is described by the following characteristics.

Organization Size And Dimensions

- $1 billion in annual revenue.
- 5,000 employees.
- A leading provider of consumer products and services over the Internet.

Current Environment

- Over 2,500 database instances in both production and non-production environments.
- Agile development environment for their proprietary platform.
- Legacy masking solution built with internally-developed scripts. This legacy solution used an algorithm to shift data and was not full data masking.
- Delivery of environments for developers with data masking through the legacy solution took, on average, two weeks.

Reasons For Investing In Oracle Data Masking Pack

- To demonstrate compliance with risk management and mitigation to their customers and partners.
- To address the time when the legacy or custom solution was too slow to meet the needs of their Agile development environment and growing business.
- To improve compliance reporting.
- To reduce exposure of sensitive data by implementing data masking.
- Needed an enterprise-level data solution.
Appendix B: 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 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 enterprise wide 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 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**

For 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 the 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

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Category</th>
<th>Calculation</th>
<th>Initial cost</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.