A Forrester Total Economic Impact™ Study

Commissioned By

CA Technologies

Project Director:
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The Total Economic Impact™ Of The CA Technologies Test Data Manager Solution

Cost Savings And Business Benefits Enabled By Test Data Manager

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ABOUT FORRESTER CONSULTING

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Executive Summary

CA Technologies commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying the CA Test Data Manager solution. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of implementing *CA* comprehensive test data management solution on their organization.

To better understand the benefits, costs, and risks associated with *CA* Test Data Manager, Forrester interviewed four existing customers using the solution. The interviews revealed that Test Data Manager provided customers with a secure end-to-end test management solution that gave them the flexibility and efficiency required to design and develop test cases to help facilitate bringing IT projects to market faster. The customers, who had all adapted the Agile software development methodology, highlighted that the Test Data Manager solution provides their teams with the right data at the right time to improve their testing velocity and increase IT resource productivity, as well as reduce the time-to-market of key business applications.

CA Test Data Manager solution can help organizations lower costs of executing IT projects, improve IT resource productivity, and increase productivity of database engineers responsible for provisioning and making test data available throughout the software development life cycle.

The present value of costs and benefits over three years for the *Composite Organization* headquartered in the United States with 40,000 full-time employees who invested in CA Test Data Manager are:

- **Software license and annual support costs: $796,749.**
- **Implementation and annual internal support costs: $1,626,468.**
- **Total three-year benefits: $9,380,147.**

Customers described *CA* Test Data Manager solution as an opportunity to meet business objectives, such as operational costs, privacy of customer data, and reduced time-to-market, while simultaneously meeting employee objectives, such as more flexibility to quickly access applications, create test use cases, and provide higher quality standards to increase productivity. According to a manager of IT data architecture of a large financial services organization: “With Test Data Manager, we are now more flexible and have a strong peace of mind that our customer’s personal information is secure. We have significantly reduced our time to test and roll out applications, and the comprehensive test management platform makes our IT staff more efficient.”

CA TECHNOLOGIES TEST DATA MANAGER REDUCES IT PROJECT COSTS WITH ITS COMPREHENSIVE TEST DATA MANAGEMENT SOLUTION

Our interviews with four existing customers and subsequent financial analysis found that a *Composite Organization* based on these interviewed organizations experienced the three-year risk-adjusted ROI, benefits, and costs shown in Figure 1.[1] The analysis points to three-year benefits (present value) of over $9 million versus total costs of about $2.4 million, for a three-year net present value (NPV) of over $6.9 million.

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted Results

ROI: 287%	NPV: $6,956,930	Payback period: 6 to 7 months	Total benefits: $9,380,147

Source: Forrester Research, Inc.

› **Benefits.** *The Composite Organization* experienced the following risk-adjusted benefits (present value) that represent those experienced by the four interviewed companies over three years:

- **IT project cost avoidance of $3,762,585.** Our *Composite Organization*, on average, completes 500 IT projects a year in steady state. Twenty-five percent of these IT projects require significant testing and development time and synchronization of data from multiple systems. These projects, on average, cost $100,000, and through its investment in Test Data Manager, the *Composite Organization* was able to save up to 25% of time-to-value of these IT projects due to quicker data access and better data quality. The organization ramped up its usage from 200 IT projects in Year 1 to 500 IT projects in Year 3.
- **IT developer, QA, and tester savings, equating to $5,423,531 per year.** Our *Composite Organization* realized 30% of time savings for both its onshore and offshore IT developers, QA teams, and testing resources. With features such as high-performance data masking, intelligent data sub-setting, synthetic test data creation, and keeping data consistent across multiple systems, the *Composite Organization* was able to reduce the labor time required and increase the efficiency of its development cycle.

> *"Our IT pipeline has new releases going into production on a weekly basis. Test Data Manager has significantly reduced our testing cycles to help meet these requirements."*
>
> ~ Senior Engineer, Retail Company

- **Increased productivity of database engineers, equating to $194,031 in savings.** Prior to Test Data Manager, the *Composite Organization* had a team of 10 database engineers who were manually writing scripts and using labor-intensive techniques to identify and provide the correct test data requirements. After the implementation of *CA* Test Data Manager solution, the *Composite Organization* was able to see an increase in productivity of its database engineers responsible for providing testing data by 25% over a three-year period.

Additional benefits not quantified in this study include reduced third-party testing fees, reduced cost attributed to risk of data breaches, and the revenue and business value resulting from faster IT development and releases. These benefits were all realized by the interviewed companies, but specific quantifiable information was not available.

› **Costs.** The *Composite Organization* experienced the following risk-adjusted costs:

- **Software licensing fees of $500,000.** These are initial, one-time fees paid to CA Technologies for licensing and access to Test Data Manager. The *Composite Organization* purchased these licenses over a three-year period. To be conservative, all pricing in this study represents the list price for CA Test Data Manager and doesn't include any potential discounting.
- **Annual maintenance costs of 20% of license costs per year.** This is a recurring fee paid to CA Technologies for ongoing software maintenance.
- **Professional fees of $100,000.** The *Composite Organization* hired outside consultants to assess, integrate, train, and support its deployment of *CA* Test Data Manager Solution.
- **Hardware storage costs of $150,000.** The *Composite Organization* had to upgrade its storage hardware as a result of its investment in *CA* Test Data Manager Solution. Two additional servers at a cost of $75,000 each were installed by the *Composite Organization*.
- **Initial internal support costs of $90,000 and ongoing internal support costs of $432,000 per year.** The composite organization had a team of three FTEs, which included project managers, DBAs, and developers who helped implement the Test Data Manager solution over three months. Ongoing, the composite organization had three FTEs after three years dedicated to supporting the solution.

Disclosures

The reader should be aware of the following:

- The study is commissioned by CA Technologies and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- 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 CA Technologies Test Data Manager.
- CA Technologies 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.
- CA Technologies provided the customer names for the interviews but did not participate in the interviews.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing CA Technologies Test Data Manager. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve the overall business goals of winning, serving, and retaining customers.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that CA Technologies Test Data Manager can have on an organization (see Figure 2). Specifically, we:

- Interviewed CA Technologies marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to Test Data Manager and the marketplace for Test Data Manager.
- Interviewed four organizations currently using CA Technologies Test Data Manager to obtain data with respect to costs, benefits, and risks.
- 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*. The discount rate used in the PV and NPV calculations is 10%, and the time horizon used for the financial modeling is three years.
- Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling CA Technologies Test Data Manager's service: benefits, costs, flexibility, and risks.

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

FIGURE 2
TEI Approach

Source: Forrester Research, Inc.

Analysis

COMPOSITE ORGANIZATION

For this study, Forrester conducted a total of four interviews with representatives from the following companies, which are CA Technologies customers based in the US:

- A US-based retailer with both eCommerce and brick-and-mortar stores. It has over $10 billion in annual revenue and 65,000 employees. The retailer deployed the CA Technologies Test Data Manager solution in 2012 to increase the security of its customer data, reduce the time-to-market of deploying new business applications and software, and have common data across multiple systems.
- A large privately held full-service bank headquartered in Europe. The bank specializes in the private banking sector and lending through distribution of worldwide credit and payment cards. The bank implemented the CA Technologies Test Data Manager solution five years ago, as a growing amount of its IT testing was happening offshore, and it wanted to maintain data privacy and quality of its customer data.
- A large full-service bank headquartered in North America. The bank has over $700 billion of assets under management and 80,000 employees. This organization has over 1,200 branch locations in its network and serves over 1.5 million clients on a yearly basis. Security and maintaining personal information privacy for its clients and customers was the driving objective of investing in the CA Technologies Test Data Manager solution. It has locations throughout North America. After deploying the CA Technologies Test Data Manager solution, it saw a dramatic increase in efficiency in its testing and deployment of new IT initiatives compared with its previous way of testing and rolling out IT projects.

> *"Test Data Manager's intelligent masking feature significantly reduces the burden on our IT teams who were manually masking customers' personal information before making data available to test."*
>
> ~ Senior data engineer, bank

- A large multinational financial services company headquartered in the US with over $35 billion in revenue and 50,000 employees worldwide. This organization invested in the CA Technologies Test Data Manager solution as it was moving to the Agile IT software development methodology and needed faster access to data. It also wanted to make its IT resources and processes more efficient, and the CA Test Data Manager solution provided the company with self-service capabilities.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The *Composite Organization* that Forrester synthesized from these results represents an organization with the following characteristics:

- It is a US-based organization with over 40,000 employees and $20 billion in annual revenue.
- It implemented the CA Technologies Test Data Manager solution three years ago.
- It has 250 onshore and offshore IT resources (developers, testers, and QA resources) managing over 500 IT initiatives a year.
- Maintaining customer data privacy while increasing efficiency of rolling out IT projects was the organization's primary objective when investing in the CA Technologies Test Data Management solution
- Prior to its investment, the composite organization was relying mainly on manual in-house IT resource time to get data sets to test IT initiatives.

INTERVIEW HIGHLIGHTS

The composite organization faced challenges and had results similar to the interviewed companies.

Situation

The *Composite Organization* realized that its current test data management processes posed many challenges resulting from security and privacy concerns related to its customers' personal information, excessive labor costs from identifying and sourcing data to test new applications, and tight timelines for delivering an increased number of IT initiatives. Additionally, facing an increased number of complex IT projects, the *Composite Organization* was moving from waterfall to an Agile software development process and integrating more cloud-based applications. This approach required access to test data continuously throughout the development cycle, and the organization's current manual and labor-intensive process of providing developers and testers with the right set of data was not effective. The challenges that the interviewed organizations faced included:

- Obtaining test data and synchronizing across multiple systems, which consumed significant time and required a lot of manual effort.
- Keeping its production data secure and compliant, in order to keep its customers' personal information private, especially as it was working with offshore and third-party IT providers.
- Moving to an Agile methodology, which required more frequent and timely test cases. Its current processes were affecting project timelines and slowing down work.
- Improving test coverage across various scenarios to reduce rework and defects.
- Ensuring IT applications are delivered within budget and accelerating the software development life cycle to increase the time-to-value of the applications.
- Improving the quality of the applications to deliver that focused on the end user experience.

> *"With CA Test Data Manager Solution, we reduced our time to get test data from 21 days to two days, making our entire software delivery cycle more efficient."*
>
> ~ Director of quality assurance and strategy, financial services company

Solution

The *Composite Organization* selected *CA* Test Data Manager, as it was the most complete end-to-end test data management solution. The solution provided the *Composite Organization* with the features to maintain compliance, reduce delays within its software development life cycle, and increase the coverage and accuracy of provisioning and synchronizing test data across multiple systems.

Results

The interviews revealed that the *Composite Organization*:

- Significantly reduced the cost of delivering IT projects.
- Increased the productivity of its IT resources who were responsible for developing, testing, and conducting QA of new applications.
- Reduced the time that DBAs and engineers required to provide test data to their IT counterparts.

BENEFITS

The Composite Organization experienced a number of quantified benefits in this case study:

- IT project cost avoidance of 25%.
- Increase in IT developer productivity of 30%.
- Increase in database engineer productivity by 25%.

IT Project Cost Avoidance

The Composite Organization indicated that a key benefit from its investment in Test Data Manager was the ability to complete IT projects and roll out applications much more effectively and efficiently. The solution allowed the *Composite Organization* an automated way to provision for test data, formalize processes to reduce the manual intervention throughout a project's testing life cycle, use synthetic data to maintain privacy and compliance, and maintain data relationships for synchronization across multiple systems.

The *Composite Organization* identified that it executes an average of 500 IT projects a year. About 25%, or 125 of these IT initiatives, require data synchronization across multiple systems and a significant amount of testing throughout the project's life cycle. These IT projects have an average budget of $100,000. Initially, the Composite Organization tested out the Test Data Manager solution to a subset of projects. Over three years (see Table 1), the *Composite Organization* indicated that through its investment in Test Data Manager, it was able to see a cost avoidance of 20% to 25%.

Interviewed organizations provided a broad range of IT initiatives that they execute each year, since a variety of variables, including the scale and complexity of each project, could have an impact on these results. To compensate, this benefit was risk-adjusted and reduced by 20%. The risk-adjusted total benefit resulting from IT project cost avoidance was $2.5 million over the three years. See the section on Risks for more detail.

TABLE 1
IT Project Cost Avoidance

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Number of IT projects		200	350	500
A2	Percentage of projects that require data synchronization		25%	25%	25%
A3	Average cost of IT project		$100,000	$100,000	$100,000
A4	Percent project cost avoidance due to the Test Data Manager solution		20%	20%	25%
At	Project cost avoidance	A1*A2*A3*A4	$1,000,000	$1,750,000	$3,125,000
	Risk adjustment	↓20%			
Atr	**Project cost avoidance (risk-adjusted)**		**$800,000**	**$1,400,000**	**$2,500,000**

Source: Forrester Research, Inc.

IT Resource Productivity (Developers, Testers, QA)

The Composite Organization was able to improve productivity across its IT teams that were responsible for developing, testing, and rolling out IT applications and initiatives. Prior to the investment in CA Test Data Manager, IT resources would have to wait 21 to 25 days to get data provisioned for them to test a solution. This caused project delays but also left these IT resources underutilized.

The Composite Organization has 250 IT FTEs, including both onshore and offshore resources. The organization has 150 onshore FTEs and 100 offshore FTEs who are responsible for developing project requirements, testing, and conducting quality checks throughout the project life cycle. In Year 1, the *Composite Organization* tested the Test Data Manager solution with a subset of its IT resources before rolling it out to the entire organization. The cost for an onshore FTE is about $80,000 a year, and an offshore FTE costs $40,000 a year. The *Composite Organization* indicated that with Test Data Manager, it was able to increase efficiency of these resources by 30% over three years (see Table 2). Furthermore, the *Composite Organization* indicated that about 40% of the efficiencies gained actually translate into productive impact. This results in $4.8 million in savings in Year 3.

Interviewed organizations provided a broad range of efficiencies based on differences in use cases. To compensate, this benefit was risk-adjusted and reduced by 10%. The risk-adjusted total benefit resulting from IT efficiencies in Year 3 was over $4.3 million. See the section on Risks for more detail.

TABLE 2
IT Resource Productivity (Developers, Testers, QA)

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Total onshore IT resources		40	60	150
B2	Average yearly cost per onshore resource		$80,000	$80,000	$80,000
B3	Total offshore IT resource		10	25	100
B4	Average yearly cost per offshore resource		$40,000	$40,000	$40,000
B5	Percentage increase in IT resource productivity		30%	30%	30%
Bt	Increase in IT resource productivity	{(B1*B2)+(B3*B4)}*B5	$1,080,000	$1,740,000	$4,800,000
	Risk adjustment	↓10%			
Btr	**Increase in IT resource productivity (risk-adjusted)**		**$972,000**	**$1,566,000**	**$4,320,000**

Source: Forrester Research, Inc.

Increase In Database Engineer Productivity

Another benefit realized by the *Composite Organization* was the productivity of its database engineers who are responsible for provisioning, masking, and making test data available for their IT counterparts. Prior to CA Test Data Manager, database engineers would have to manually write scripts to gain subsets of production data for their teams to build. Additionally, the team would be responsible for masking customer information, matching data sets across systems for consistency, and making sure the sample was significant enough to test a solution accurately. This was a very labor-intensive and manual process that not only involved an increased amount of time but also increased the risk of errors and rework.

The Composite Organization has a total of 10 database engineers who have access to CA Test Data Manager after three years. Initially it was rolled out to only a subset of database engineers. The solution increased their productivity by 25%, which results in a Year 3 cost savings of $150,000 (See Table 3).

Interviewed organizations provided a range in the number of database engineers, their fully burdened cost, and how much more productivity was driven by CA Test Data Manager. To compensate, this benefit was risk-adjusted and reduced by 10%. The risk-adjusted total benefit resulting from an increase in database engineer productivity was $135,000 by Year 3. See the section on Risks for more detail.

TABLE 3
Increase In Database Engineer Productivity

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Total number of database engineers with CA TDM licenses		3	5	10
C2	Average yearly cost per database engineer		$150,000	$150,000	$150,000
C3	Percentage increase in productivity of database engineers		25%	25%	25%
C4	Percentage increase in productivity translated to profitability		40%	40%	40%
C5	Increase in database engineer productivity	C1*C2*C3*C4	$45,000	$75,000	$150,000
	Risk adjustment	↓10%			
Ctr	**Increase in database engineer productivity (risk-adjusted)**		**$40,500**	**$67,500**	**$135,000**

Source: Forrester Research, Inc.

Total Benefits

Table 4 shows the total of all benefits across the four areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the *Composite Organization* expects risk-adjusted total benefits to be a PV of more than $14 million.

TABLE 4
Total Benefits (Risk-Adjusted)

Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	IT project cost avoidance	$800,000	$1,400,000	$2,500,000	$4,700,000	$3,762,585
Btr	IT resource productivity (developers, QA, testers)	$972,000	$1,566,000	$4,320,000	$6,858,000	$5,423,531
Ctr	Increase in database engineer productivity	$40,500	$67,500	$135,000	$243,000	$194,031
	Total benefits (risk-adjusted)	**$1,812,500**	**$3,033,500**	**$6,955,000**	**$11,801,000**	**$9,380,147**

Source: Forrester Research, Inc.

COSTS

The Composite Organization experienced a number of costs associated with *CA* Test Data Manager solution:

- Software licensing cost.
- Annual maintenance cost.
- Professional fees.
- Hardware costs.
- Internal support cost.

These represent the mix of internal and external costs experienced by the *Composite Organization* for initial planning, implementation, and ongoing maintenance associated with CA Test Data Manager.

Please note 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 10% discount rate. For additional information, see Appendix D.

Initial Software Licensing And Annual Maintenance Cost

Software licensing costs for CA Test Data Manager were incurred during the initial implementation period; in subsequent years, an annual maintenance fee, calculated as a percentage of the initial software licensing fee, was applied. The composite organization purchased initial licenses and then ramped up to add additional users. The total cost for software licensing over three years was $500,000.

Each year, the *Composite Organization* incurred a maintenance cost for ongoing access. The maintenance cost included 24x7 support and software upgrades developed by CA Technologies that enhance core functionalities and expand the range of industry-specific features. The *Composite Organization* incurred a 20% annual maintenance cost, applied as a percentage of its initial software licensing cost, for an annual maintenance cost of $100,000 (see Table 5). For an organization, annual maintenance fees may vary slightly from year to year.

Software and maintenance costs can vary from organization to organization, considering different licensing agreements, what other products may be licensed from the same vendor, and other discounts. To compensate, this cost was risk-adjusted up by 15%. The risk-adjusted cost of software and maintenance over the three years was $920,000. See the section on Risks for more detail.

TABLE 5
Software Licensing Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Initial software license costs per user		$150,000	$150,000	$100,000	$100,000
D2	Annual maintenance costs per user			$100,000	$100,000	$100,000
D3	Total TDM software and annual maintenance costs	D1+D2	$150,000	$250,000	$200,000	$200,000
	Risk adjustment	↑15%	115%			
Dtr	**Total TDM software and annual maintenance costs (risk-adjusted)**		**$172,500**	**$287,500**	**$230,000**	**$230,000**

Source: Forrester Research, Inc.

Professional Fees

To help with an initial assessment and the evaluation of CA Test Data Manager and other solutions, the *Composite Organization* incurred professional services fees of $100,000 (see Table 6). The professional services were responsible for planning; assessing and vetting different solutions and vendors; integrating software; and developing and conducting training. The professional services were required for three months.

As many organizations may have different levels of complexity and in-house expertise, their professional services needs may be different. For this reason, we have risk-adjusted the cost up by 15%. See the section on Risks for more detail.

Additional Hardware Costs

In order to take advantage of CA Test Data Manager and its higher network computing, the *Composite Organization* had to invest in two additional storage servers. The cost of these was $75,000 per server (see Table 6) and was incurred during the initial investment period.

Not all organizations would need to purchase additional storage to support their investment in CA Test Data Manager. Depending on environment demands and storage bandwidth required, each organization may experience a different hardware cost. To compensate, this cost was risk-adjusted and increased by 15%.

Internal Support Cost

In order to plan and assess different end-to-end test management solutions, implement CA Test Data Manager, and then manage the solution on an ongoing basis, the *Composite Organization* needed to allocate internal resources. During the initial planning and implementation period, which lasted three months, the *Composite Organization* allocated three FTEs. In steady state, the ongoing management of Test Data Manager required support from two FTEs in years 1 and 2 and up to three FTEs in Year 3. The fully loaded rate of an implementation FTE is $10,000 per month, and an ongoing support FTE is $12,000 a year. This resulted in an initial cost of $340,000 and an ongoing cost of $432,000 (see Table 6).

Interviewed organizations provided a range of formats and FTEs to support CA Test Data Manager internally, including hiring an outside managed services team. Depending on environment demands and the complexity of each organization, internal support costs may differ. To compensate, this cost was risk-adjusted and increased by 15%.

TABLE 6
Professional Service, Hardware, And Internal Support Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Professional service fees		$100,000			
E2	Hardware costs (two additional servers)		$150,000			
E3	Number of FTEs to support Implementation		3	3	3	3
E4	Number of months		3	12	12	12
E5	Monthly cost of FTE		$10,000	$12,000	$12,000	$12,000
Et	Professional service fees, hardware and internal support costs	(E1+E2)+(E3*E4*E5)	$340,000	$432,000	$432,000	$432,000
	Risk adjustment		115%			
Etr	**Professional service fees, hardware, and internal support costs (Risk-Adjusted)**		**$391,000**	**$496,800**	**$496,800**	**$496,800**

Source: Forrester Research, Inc.

Total Costs

Table 7 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the *Composite Organization* expects total costs to total a net present value of less than $2.5 million.

TABLE 7
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Dtr	Initial software and annual maintenance costs	$172,500	$287,500	$230,000	$230,000	$920,000	$796,749
Etr	Professional service fees, hardware, and internal support costs	$391,000	$496,800	$496,800	$496,800	$1,881,400	$1,626,468
	Total costs (risk-adjusted)	**$563,500**	**$784,300**	**$726,800**	**$726,800**	**$2,801,400**	**$2,423,217**

Source: Forrester Research, Inc.

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 Test Data Manager and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project, as described in more detail in Appendix B.

Our *Composite Organization* has the opportunity to use more-sophisticated features and functionality through customization that will allow it to further manage and share disparate amounts of content across its organization. Additionally, the *Composite Organization* has the flexibility to scale up the number of devices and users who can both engage with the platform and benefit from it.

RISKS

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 CA Test Data Manager 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 Test Data Manager, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 8
Benefit And Cost Risk Adjustments

Benefits	Adjustment
IT project cost avoidance	↓ 20%
IT resource productivity	↓ 10%
IT database engineer productivity	↓ 10%
Costs	**Adjustment**
Software licensing cost	↑ 15%
Annual maintenance cost	↑ 15%
Professional fees	↑ 15%
Hardware costs	↑ 15%
Internal support costs	↑ 15%

Source: Forrester Research, Inc.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides 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 since they represent the expected values considering risk.

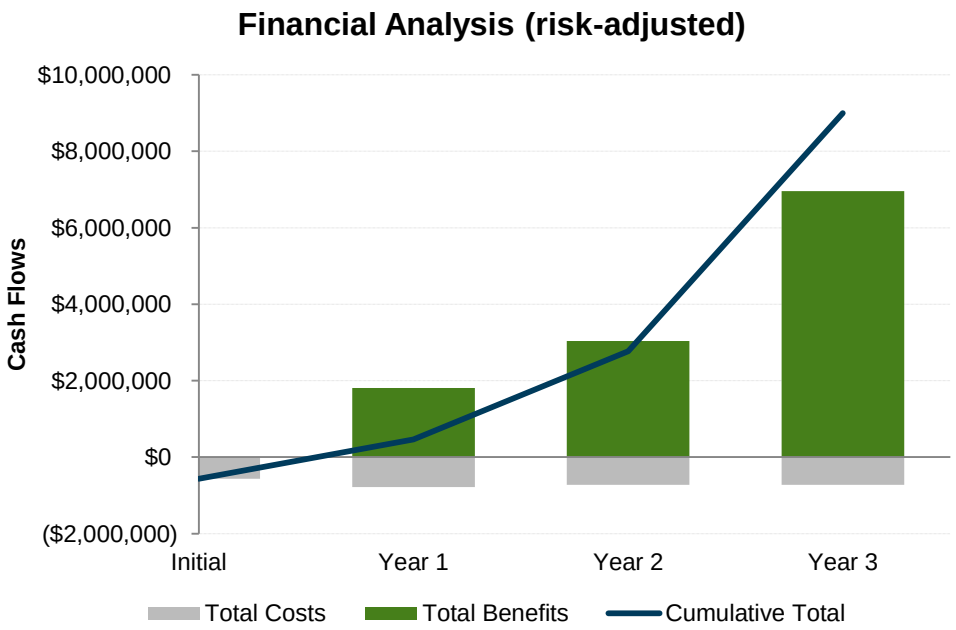
Table 10 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the *Composite Organization*. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the *Composite Organization*'s investment in Test Data Manager.

Table 9 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 8 in the Risks section to the unadjusted results in each relevant cost and benefit section.

TABLE 9
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 10
Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	($563,500)	($784,300)	($726,800)	($726,800)	($2,801,400)	($2,423,217)
Benefits	$0	$1,812,500	$3,033,500	$6,955,000	$11,801,000	$9,380,147
Net benefits	**($563,500)**	**$1,028,200**	**$2,306,700**	**$6,228,200**	**$8,999,600**	**$6,956,930**
ROI						**287%**
Payback period						**6.6 months**

Source: Forrester Research, Inc.

CA Technologies Test Data Manager: Overview

The following information is provided by CA Technologies. Forrester has not validated any claims and does not endorse CA Technologies or its offerings.

The application economy is driving massive digital transformation. As a result, organizations are increasingly under pressure to continuously deliver valuable and high-quality applications faster than ever before. Yet the quality of an application depends on the quality of the data for testing, and creating the right test data, in the right place, at the right time, remains a significant challenge.

CA Test Data Manager can help organizations find, create, and provision the data needed for testing — automatically and fast. Test data constraints, which routinely compromise application quality, can be eliminated, accelerating application delivery to market, on time and within budget.

CA Test Data Manager provides customers with the flexibility and functionality required to quickly find, design, secure, and create the fit-for-purpose test data required to shift left testing, mitigate the risk of defects in production, and reduce time-to-market.

A complete test data management solution, CA Test Data Manager provides powerful, flexible functionality for securing smaller, realistic subsets of production, mitigating risk and reducing infrastructure costs. CA Test Data Manager can also enhance the quality of your production data or fill gaps in your coverage based on the optimal minimum set of test cases to fully cover your requirements. Use innovative functionality to find and match existing data to specific tests or generate synthetic data.

Appendix A: Composite Organization Description

For this study, Forrester conducted a total of four interviews with representatives from the following companies, which are CA Technologies customers based in the US:

- A US-based retailer with both eCommerce and brick-and-mortar stores. It has over $10 billion in annual revenue and 65,000 employees. The retailer deployed the CA Technologies Test Data Manager solution in 2012 to increase the security of its customer data, reduce the time-to-market of deploying new business applications and software, and have common data across multiple systems.
- A large privately held full-service bank headquartered in Europe. The bank specializes in the private banking sector and lending through distribution of worldwide credit and payment cards. The bank implemented the CA Technologies Test Data Manager solution five years ago, as a growing amount of its IT testing was happening offshore, and it wanted to maintain data privacy and quality of its customer data.
- A large full-service bank headquartered in North America. It has over $700 billion of assets under management and 80,000 employees. This organization has over 1,200 branch locations in its network and serves over 1.5 million clients on a yearly basis. Security and maintaining personal information privacy for its clients and customers was the driving objective of investing in the CA Technologies Test Data Manager solution. It has locations throughout North America. After deploying the CA Technologies Test Data Manager solution, it saw a dramatic increase in efficiency in its testing and deployment of new IT initiatives, compared with its previous way of testing and rolling out IT projects.
- A large multinational financial services company headquartered in the US with over $35 billion in revenue and 50,000 employees worldwide. This organization invested in the CA Technologies Test Data Manager solution as it was moving to the Agile IT software development methodology and needed faster access to data. It also wanted to make its IT resources and processes more efficient, and the CA Test Data Manager solution provided the company with self-service capabilities.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The *Composite Organization* that Forrester synthesized from these results represents an organization with the following characteristics:

- It is a US-based organization with over 40,000 employees and $20 billion in annual revenue.
- It implemented the CA Technologies Test Data Manager solution three years ago.
- It has 250 onshore and offshore IT resources (developers, testers, and QA resources) managing over 500 IT initiatives a year.
- Maintaining customer data privacy while increasing efficiency of rolling out IT projects was its primary objective to invest in the CA Technologies Test Data Management solution.
- Prior to its investment, the *Composite Organization* was relying mainly on manual in-house IT resource time to get data sets to test IT initiatives.

FRAMEWORK ASSUMPTIONS

Table 11 provides the model assumptions that Forrester used in this analysis.

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.

TABLE 11
Model Assumptions

Ref.	Metric	Calculation	Value
C1	Hours per week		40
C2	Weeks per year		50
C3	Hours per year (M-F, 9-5)		2,000
C4	Average onshore developer, tester, QA resource cost per year		$80,000
C5	Average offshore developer, tester, QA resource cost per year		$40,000

Source: Forrester Research, Inc.

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. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

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.

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. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

RISKS

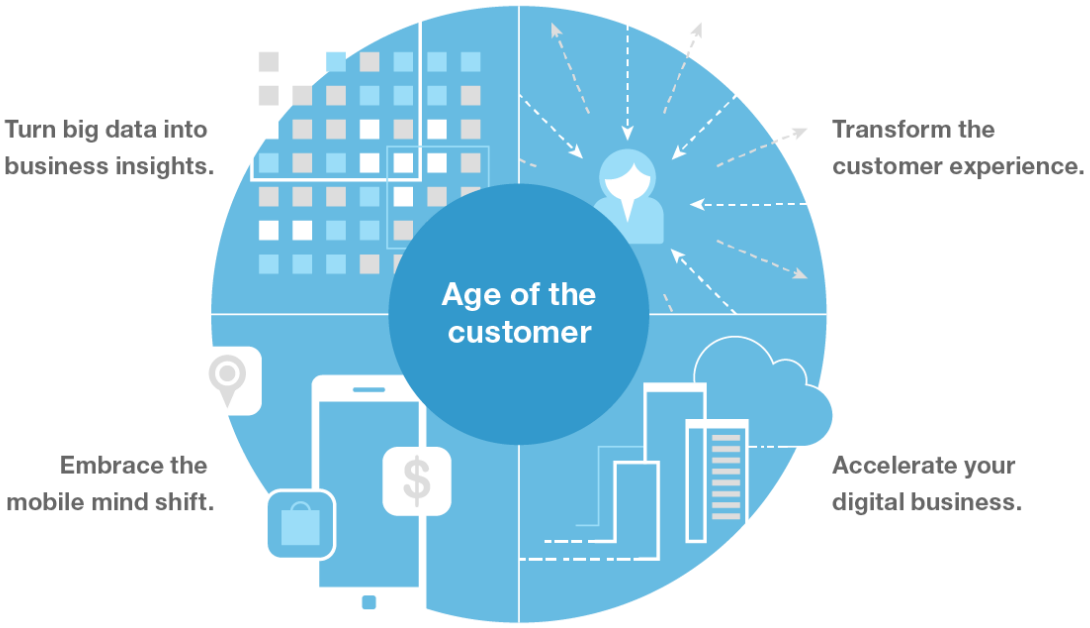
Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI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

Appendix C: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

CMOs and CIOs must work together to create this companywide transformation.



Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:

Transform the customer experience to gain sustainable competitive advantage.

Accelerate your digital business with new technology strategies that fuel business growth.

Embrace the mobile mind shift by giving customers what they want, when they want it.

Turn (big) data into business insights through innovative analytics.

Appendix D: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own 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 organizations to determine the most appropriate discount rate to use in their own environment.

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

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

Payback period: The breakeven point for an investment. This is 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 the Framework Assumptions section) at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until the summary tables are the sum of the initial investment and the discounted cash flows in each year.

Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix E: Endnotes

[1] Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information, see the section on Risks.