Total Economic Impact™ Of CA Mainframe 2.0

CA Mainframe Software Manager, Mainframe Value Program and Health Checker Integration

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Executive Summary

In April 2010, CA Technologies commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying some key initial deliverables of their CA Mainframe 2.0 strategy. The key CA Mainframe 2.0 deliverables (components) examined were CA Mainframe Software Manager (CA MSM), Mainframe Value Program (MVP) and IBM Health Checker Integration. Additionally, the version of CA MSM in use by customers at the time of the interviews was CA MSM r2, which covers the acquisition, installation and maintenance of CA Technologies mainframe software.

The CA Mainframe 2.0 components examined here are all free of charge to customers who have at least one CA Technologies mainframe solution under a current maintenance contract. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of deploying these CA Mainframe 2.0 components in their organizations.

CA Mainframe 2.0 Streamlines And Simplifies Mainframe System Management

Our interviews with four existing customers and subsequent financial analysis found that a composite organization based on the companies we interviewed experienced the risk-adjusted ROI, costs, and benefits shown in Table 1. See Appendix A for a description of the composite organization.

Table 1

<table>
<thead>
<tr>
<th>ROI</th>
<th>Payback period</th>
<th>Total benefits (PV)</th>
<th>Total costs (PV)</th>
<th>Net present value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,165%</td>
<td>2 months</td>
<td>$250,171</td>
<td>($19,775)</td>
<td>$230,396</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

- **Benefits.** The composite organization experienced many benefits that represent those experienced by the interviewed companies. The first two points below could be quantified for the ROI analysis portion of the study. The remainder could not be quantified, but may be of equal or greater importance to the reader’s organization. All benefits should be taken into consideration when evaluating the potential value of using these CA Mainframe 2.0 components. The quantitative and qualitative benefits include:
  - **Mainframe operations team savings.** This benefit was quantified for the study. CA MSM greatly reduces the level of effort required to install updates and to maintain CA Technologies mainframe solutions by providing a more intuitive graphical user interface (GUI) and guided workflows to complete these activities. The time saved can be used by the mainframe operations team to focus on higher-value activities. In addition to this productivity gain, the reduction in effort and specialized skill requirements allowed for positions vacated by retiring employees to be entirely
eliminated or filled with more junior resources who did not need years of specialized mainframe experience.

- **Application developers productivity gain.** There are many application developers who rely on new CA Technologies mainframe products to be installed, reconfigured, and/or updated in order to complete their development work. These products are now available more quickly because of improved efficiencies within the mainframe operations team. The result is less time waiting for the mainframe operations team before continuing work on a project.

- **Addressing the mainframe specialist skills gap.** IT professionals graduating from universities lack the in-depth skills of seasoned mainframe professionals. Additionally, there is currently less interest in learning these technologies. Providing a graphical management interface allows these individuals to install, update, and maintain CA Technologies mainframe solutions without the need to learn how to write complex scripts for the mainframe.

- **Adherence to IT best practices and a reduction in installation errors.** CA MSM ensures the proper procedures are being followed and reduces change control process complexity for installing and updating CA Technologies mainframe solutions. It also enforces a standard process and creates better documentation about what has been installed and maintained through CA MSM. The result is fewer errors and greater productivity.

- **Improved IT security.** The Health Checker Integration and MVP services identified potential configuration settings that created security risks. These services also assisted in implementing and testing the appropriate fixes.

- **Costs.** The costs associated with CA Mainframe 2.0 are very low in comparison with the benefits realized. All CA Mainframe 2.0 components examined in this report are available at no cost to customers who have at least one CA Technologies mainframe solution under a current maintenance contract. The composite organization experienced the following costs:

  - **Initial installation labor costs.** Installing CA MSM is a very straightforward process. It takes from a few hours to a couple of days to install and configure this component. One customer who was beta testing CA MSM r3 experienced shorter installation times due to efficiency improvements in the newer installation process.

  - **Ongoing operations labor costs.** This cost includes only activities specifically associated with operating the CA Mainframe 2.0 components. The time to install and maintain CA Technologies mainframe solutions is actually less than without CA Mainframe 2.0, as described in the benefits above. Ongoing operations include installing updates to CA MSM, setting up new user accounts and training new CA MSM users.

Figure 1 outlines the low costs associated with implementing and operating the CA Mainframe 2.0 components along with the very quick return on investment.
Factors Affecting Benefits And Costs

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

- **Factor 1: Number of CA Technologies mainframe products in use.** For the quantified benefits, reduced effort to install, update, and maintain CA Technologies mainframe products is based on the current level of effort using traditional methods, which is proportional to the number of products that need to be managed. However, the incremental effort associated with managing additional products under CA MSM is by no means linear. Therefore, the reader should not expect to see a significant increase in effort as more products are added and managed using CA MSM.

- **Factor 2: Number and type of business processes dependent on the mainframe.** For the qualified benefits, companies that have more critical business processes running on the mainframe will realize greater benefits in terms of business value creation, improved IT security, etc.

**Disclosures**

The reader should be aware of the following:

- The study is commissioned by CA Technologies and delivered by the Forrester Consulting group.
• Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in the various CA Mainframe 2.0 components.

• 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.

• The customer names for the interviews were provided by CA Technologies.
TEI Framework And Methodology

Introduction
From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ framework for those organizations considering implementing CA Mainframe 2.0 components. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Most monetary values shown in this study are rounded to the nearest dollar for simplicity of presentation. Actual financial calculations might be based on figures carried to more decimal points than shown here and therefore not entirely match the resultant figures presented in the tables.

Approach And Methodology
Forrester took a multistep approach to evaluate the impact that CA Mainframe 2.0 can have on an organization (see Figure 2). Specifically, we:

- Interviewed CA Technologies marketing, sales, and product management personnel as well as Forrester analysts to gather data relative to CA Mainframe 2.0 and the marketplace for CA Mainframe 2.0.

- Interviewed four organizations currently using the CA Mainframe 2.0 components examined in this study 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.

Figure 2
TEI Approach

Forrester employed four fundamental elements of TEI in modeling the CA Mainframe 2.0 components:

1. Costs.
2. Benefits to the entire organization.
Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester’s TEI methodology serves the purpose of providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

**Analysis**

**Interview Highlights**

We conducted a total of four interviews for this study, involving representatives from the following CA Technologies customers based in the United States:

1. **Global financial services and investment management company.** The core financial broker business processes run on the mainframe. “We have a long-term commitment to the mainframe. It is definitely not going away.” This company has been a CA Technologies mainframe customer for more than 20 years. There are 13 employees in the mainframe support team who use various CA Mainframe 2.0 components. There are approximately 250 mainframe application developers. All currently available CA MSM features (see the product overview section for more detail) are used, and they have participated in the MVP program multiple times.

2. **US auto insurance company.** Core billing and quoting systems are all housed on the mainframe. There is an effort to expose mainframe applications on the Internet for use by external customers. “We are deploying sizable systems on the mainframe, such as billing. The effort is quite significant.” There are five members of the mainframe operations team who interact with CA Mainframe 2.0. In total, there are several hundred developers working on mainframe applications. The company uses all currently available CA MSM features, which cover installing and maintaining solutions. The company also participates in the MVP programs and utilizes currently available health checks supplied in CA Technologies products.

3. **US retailer.** The company has approximately 300 retail stores operating in more than 20 states. As a result of multiple acquisitions, there has been a consolidation of business processes and systems onto the mainframe. “The mainframe has been revitalized and become the backbone of all main systems.” There are four members of the mainframe operations team who use various CA Mainframe 2.0 components. The company uses all currently available CA MSM features.

4. **US government agency.** This agency is a shared mainframe service facility for other parts of the department in which it resides. The number of business processes and applications housed on the mainframe is growing. “We are 100% committed to the mainframe.” There are approximately 40 members of the mainframe operations team, of which five work with CA Mainframe 2.0. All currently available CA MSM features are used.
The four interviews uncovered a number of salient points about customers’ experiences with CA Mainframe 2.0:

- All four customers have a long-term commitment to mainframe technologies and are forecasting increased workloads being run on the mainframe in the future.
  
  o  “Yes, we definitely have a long-term commitment to mainframe technology. It is not going away.”
  
  o  “The mainframe workloads always continue to grow, even when the business units tell us they are going to have a flat year. We are looking to flatten the growth in terms of MIPS through greater efficiencies and compiling all solutions on only the latest version mainframe products.”
  
  o  “Any application at the enterprise level we would like to run on the mainframe. We have better throughput and better stability.”

- All customers said that CA MSM is very simple to use, both in terms of the user interface and the business processes. Having a standard way of managing CA Technologies mainframe products has helped to alleviate the complexity associated with inconsistent installation processes.

  o  “With MSM, you just click on the service you want to install and the system goes out and gets it.”
  
  o  “We can now utilize the same approach to installing all CA mainframe products. We used to have to learn something different with each product. I’m very pleased to see such consistency coming forward. Especially for a company like CA that has so many products.”

- CA MSM has been very well received by mainframe operations teams, as well as broader IT development communities. This has sped up adoption and benefits realization.

  o  “After people are shown how MSM works and they try it, they like it. In six months or so when everyone has experienced it, this will be the only way to do anything.”
  
  o  “I talked to other parts of the organization to get them using MSM for installation. It has been very well received. I think it is absolutely a step in the right direction. I think this is going to make CA more of a primary vendor for mainframe solutions.”

- CA MSM makes it easier for all customers interviewed to keep up to date with the latest releases.

  o  “MSM is definitely quick. It has helped get us to the latest revisions.”
  
  o  “We can now more easily install updates as soon as they are available. That is part of our requirement to be on the leading edge for customers. We go through a quarterly review to make sure we are on top of all updates.”

- Two of the customers interviewed had participated in the MVP program and found that it delivered significant benefit to the organization.

  o  “MVP did not require much time from us for information gathering. CA went away with the information and came back with a very concrete set of suggestions on how we can improve our
mainframe performance. It focuses on things we had, and they were not trying to sell us anything.”

- “I think it is a great thing to do. You can discuss what challenges you are facing with real experts. We participated in an MVP for a couple of days, which was very valuable.”

- One interviewed customer took advantage of the Health Checker Integration testing service and found it very valuable.
  - “Participating in Health Checks is one of the best things we have done for our platform in years. We got quite a bit of value out of that. What CA is doing with its Health Checks is exactly what I want to see other vendors doing. They are very substantive, telling you what you really need to know.”

- Two customers stated that they hope other mainframe vendors will use the CA MSM framework to deliver their own updates.
  - “CA has a great solution. It’s set up the framework so any vendor can use it.”
  - “We are hoping to see other vendors adopt MSM technology since it is an open platform.”

**Composite Organization**

Based on the interviews with four existing customers provided by CA Technologies, 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 a large US-based financial services company. In addition to the US organization, there are substantial overseas operations. The company runs its core business processes, such as statement generation, financial transaction processing, and billing off of the mainframe.
Framework Assumptions
Table 2 provides the model assumptions that Forrester used in this analysis.

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Fully burdened annual salary* per senior mainframe operations employee</td>
<td>$80,000</td>
</tr>
<tr>
<td>A2</td>
<td>Fully burdened annual salary* per junior mainframe operations employee</td>
<td>$40,000</td>
</tr>
<tr>
<td>A3</td>
<td>Workdays per year</td>
<td>250</td>
</tr>
</tbody>
</table>

*Includes salary, variable compensation, and all direct benefits (e.g., health insurance)

Source: Forrester Research, Inc.

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

Costs
As discussed earlier, the CA Mainframe 2.0 components examined in this report are free of charge to customers who have at least one CA Technologies mainframe product under a current maintenance contract. Therefore, the total cost of ownership is very low — consisting just of some internal labor costs to install and maintain associated software.

Initial Implementation Labor Costs
The amount of effort it took the interviewed customers to get CA MSM up and running varied from a few hours to a couple of days. The composite organization experienced a similarly light level of effort. CA Technologies provided scripts to verify that customers had the right environment for installing CA MSM and that it was installed correctly.

The composite organization’s mainframe operations team required a total of 1.5 days to get CA MSM completely up and running. With a daily fully burdened cost of $320, the total labor implementation cost came out to $960.
Table 3
Initial Implementation Labor Costs

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Number of days</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>B2</td>
<td>Daily fully burdened cost</td>
<td>A1 / A3</td>
<td>$320</td>
</tr>
<tr>
<td>Bt</td>
<td>Initial implementation labor costs</td>
<td>B1 * B2</td>
<td>$480</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Ongoing Operations Labor Costs
Much like the installation process, maintaining CA MSM is very simple. The majority of the effort involves setting up new user accounts and training them on how to use CA MSM. “The level of effort is relatively low. Once you have it set up, maintaining status quo is easy.” The customers interviewed had to install CA MSM updates twice in a year.

Table 4
Ongoing Operations Labor Costs

<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>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Number of days per month</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Daily fully burdened cost</td>
<td></td>
<td>$320</td>
<td>$320</td>
<td>$320</td>
<td></td>
</tr>
<tr>
<td>Ct</td>
<td>Ongoing operations labor costs</td>
<td>C1 * C2 * 12 months</td>
<td>$7,680</td>
<td>$7,680</td>
<td>$7,680</td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
Total Costs
Total costs for implementing and managing CA Mainframe 2.0 components are shown in Table 5 below.

<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>Initial implementation labor costs</td>
<td>($480)</td>
<td></td>
<td></td>
<td></td>
<td>($480)</td>
</tr>
<tr>
<td>Ongoing operations labor costs</td>
<td></td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($23,040)</td>
</tr>
<tr>
<td>Total</td>
<td>($480)</td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($23,520)</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Benefits
The first half of the benefits section details the quantitative benefits included in the ROI analysis for the composite organization. The second half describes qualitative benefits that the interviewed customers experienced but that could not be quantified. The qualitative benefits are potentially as valuable as the quantitative ones and should be taken into consideration when analyzing the total return on investment realized by implementing CA Mainframe 2.0.

Mainframe Operations Team Savings
This benefit is comprised of two parts – a productivity gain for the current team, and an additional savings from retiring employee positions not being refilled or filled with lower cost, more junior resources.

Productivity Gain
CA MSM has significantly reduced the time to find, install, and properly apply updates to existing CA Technologies mainframe solutions. It has also reduced the time to troubleshoot problems because installations are completed correctly the first time and there is better, more consistent documentation generated by the system. Every customer interviewed provided multiple examples of how this benefit has been realized:

- “If someone installs a product from scratch, it would typically take 4 hours to install and 90 minutes to complete the documentation. It is not necessarily the same person installing the product the next time around, so the process did not necessarily get faster. MSM has taken a lot of the manual steps out of the process and put them in the product itself. Between upgrading each of the 30 CA mainframe products three times a year and two general maintenance upgrades each year, we have saved one man-month of effort.”
“MSM has provided us a standard, automated, fast way of maintaining our CA mainframe products. We save a couple of man-days per product and have 30 products.”

“The speed that I have picked up in installing products is great. For example, something that would have taken two days now only takes 2 hours.”

“The fact is, we can use MSM to get more products out to our internal customers at current release levels faster than we otherwise would be able to.”

“The only way we can continue to do the work we have to accomplish with the resources they’ll let us have is to use tools like MSM.”

“A large benefit has been the transparency of getting software and fixes. We just click, and under the covers MSM goes out and gets all of that. We don’t have to log on to the support center anymore to see what is available.”

The composite organization realized a productivity gain similar to the customers interviewed for this study. This amounted to one man-month of effort, or 22 workdays. To be conservative, Forrester only recognized 75% of the benefit since not all time gained through increased productivity translates into actual work effort.

Avoided and Lower Cost Hires

In addition to the productivity gain for existing mainframe operations team members, the organization was able to avoid replacing some positions vacated by retirees. Additionally, when a position did need to be filled, it was filled with a more junior resource because CA MSM allowed the employee to complete tasks without a deep knowledge of mainframe programming. All customers interviewed for the study realized or anticipate realizing this benefit.

“We recently had eight people retire out of a team of 50. MSM helped us to manage the workload without replacing the positions. I was willing to do this because I knew MSM would free up a lot of time.”

“Our team hasn’t grown for more than six years, even though the number of systems we manage has doubled. All of that has been done through in-house automation. MSM will allow us to continue to accomplish more without adding headcount.”

“The fact is, we can use MSM to get more products out to our internal customers at current release levels faster than we otherwise would be able to.”

“In the past we always hired at a pretty high senior level for the mainframe operations team. We now have a top-heavy organization. As they retire, we will be replacing some of them with people who are more junior. Not right out of college, but with just a couple of years of skills under their belt.”

“I’ve been told by management that we’ll be hiring more junior people. A couple of years of experience instead of 10 years. This will save $40,000 to $70,000 per resource.”
The composite organization’s mainframe operations team was made up of seven seasoned professionals at the beginning of the study. In Year 2, one person retired and that position was not filled. In Year 3, another team member retired, and the position was filled by a junior resource.

### Table 6
Mainframe Operations Team Savings

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Number of days of effort saved</td>
<td></td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>D2</td>
<td>Daily fully burdened cost</td>
<td>$A_1 / A_3$</td>
<td>$320$</td>
<td>$320$</td>
<td>$320$</td>
</tr>
<tr>
<td>D3</td>
<td>Percentage of benefit realized</td>
<td></td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>D4</td>
<td>Productivity gain</td>
<td>$D_1 \times D_2 \times D_3$</td>
<td>$5,280$</td>
<td>$5,280$</td>
<td>$5,280$</td>
</tr>
<tr>
<td>D5</td>
<td>Total Number of retiree positions not filled</td>
<td></td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>D6</td>
<td>Annual fully burdened salary (senior resource)</td>
<td>$A_1$</td>
<td>$80,000$</td>
<td>$80,000$</td>
<td>$80,000$</td>
</tr>
<tr>
<td>D7</td>
<td>Total Number of retirees positions replaced with a more junior resource</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>D8</td>
<td>Difference in fully burdened cost (between senior and junior resource)</td>
<td>$A_1 - A_2$</td>
<td>$40,000$</td>
<td>$40,000$</td>
<td>$40,000$</td>
</tr>
<tr>
<td>D9</td>
<td>Avoided and lower cost hires</td>
<td>$(D_5 \times D_6) + (D_7 \times D_8)$</td>
<td>$0$</td>
<td>$80,000$</td>
<td>$120,000$</td>
</tr>
<tr>
<td>Dt</td>
<td>Mainframe operations team savings</td>
<td>$D_4 + D_9$</td>
<td>$5,280$</td>
<td>$85,280$</td>
<td>$125,280$</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

*Application Developers Productivity Gain*

The broader IT community of application developers who build business solutions on top of CA Technologies mainframe products also realized a productivity gain. These developers often rely on products being installed, reconfigured, and/or updated to the latest level before the application development work can be completed. There were often delays on the part of the mainframe operations team to complete these requests because of the level of effort required. By using CA MSM, these requests are filled more quickly which allows developers to continue with their work with the elimination or reduction in waiting time.

- “We can now be more responsive to our internal customers’ needs. The time to close out service tickets has been greatly reduced.”
• “Our internal processes have been consolidated and streamlined. This has resulted in productivity gains for the mainframe operations team and application developers who rely on the mainframe.”

The composite organization has 150 application developers who rely on CA Technologies mainframe products. On average, each developer saw a productivity gain of one workday per year. Only 75% of this benefit is realized.

Table 7
Application Developers Productivity Gain

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Calculation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Number of application developers</td>
<td></td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>E2</td>
<td>Number of days of effort saved per developer</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>E3</td>
<td>Daily fully burdened cost</td>
<td>A1 / A3</td>
<td>$320</td>
<td>$320</td>
<td>$320</td>
</tr>
<tr>
<td>E4</td>
<td>Percentage of benefit realized</td>
<td></td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Et</td>
<td>Application developers productivity gain</td>
<td>E1 * E2 * E3 * E4</td>
<td>$36,000</td>
<td>$36,000</td>
<td>$36,000</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

**Total Quantified Benefits**

Table 8 summarizes the total quantified benefits that the composite organization realized by using CA Mainframe 2.0.

Table 8
Total Quantified Benefits (non-risk-adjusted)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe operations team savings</td>
<td>$5,280</td>
<td>$85,280</td>
<td>$125,280</td>
<td>$215,840</td>
</tr>
<tr>
<td>Application developers productivity gain</td>
<td>$36,000</td>
<td>$36,000</td>
<td>$36,000</td>
<td>$108,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$41,280</strong></td>
<td><strong>$121,280</strong></td>
<td><strong>$161,280</strong></td>
<td><strong>$323,840</strong></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
Qualitative Benefits

Addressing the Mainframe Specialist Skills Gap
The issue of younger IT professionals lacking the skills and experience to effectively manage mainframe systems was briefly mentioned in the quantitative benefits section above. However, it is worth discussing this topic further. All four customers interviewed indicated that the lack of knowledge of mainframe systems among newer hires is a major concern. This lack of knowledge has two causes: a lack of experience on mainframe systems and a lack of interest in learning them.

Fully training an employee on the intricacies of managing and programming mainframes using the native tools is very time consuming and expensive. GUI management interfaces and streamlined workflows offered in CA MSM allows almost anyone with basic IT skills to complete mainframe tasks easily and quickly. By addressing this skills gap, companies can remain committed to the mainframe with less concern regarding the staffing of mainframe operations teams.

- “We were concerned about losing the skill necessary to manage our mainframe systems. It is hard to find experienced mainframe people. This led to the decision to look for tools that would address this problem. That is a big part of why we implemented MSM.”

- “MSM absolutely helps with the knowledge gap. It has allowed me to approach IT staff that were not comfortable doing some of these mainframe maintenance functions and show them that they can do it. I even have interns who help out. We can now use our resources more effectively.”

- “We understand there needs to be simplification. With existing mainframe specialists getting closer to retirement, the processes need to be more transparent. We can’t have new graduates spending 10 to 15 years learning this.”

Adherence To IT Best Practices And A Reduction In Installation Errors
CA MSM automates the proper processes to manage and update CA Technologies mainframe products. This includes determining which updates are appropriate for each product, configuring the proper settings, and completing the necessary testing to be sure that everything was installed correctly. In effect, it is a best-practice installation engine. The result is fewer installation errors, less rework to fix problems, and confidence that any updates were done right the first time.

CA MSM also helps with completing and saving the appropriate documentation. CA MSM generates a log of all configurations and the installation procedures for every CA Technologies mainframe product. They are stored in a single repository for easy retrieval and review by anyone on the mainframe operations team. This means that someone else can do the update to a CA Technologies product the next time and have all of the necessary history and documentation to understand how it is to be done and the way in which any options should be set. Traditionally, ensuring proper document creation and storage has been a problem for mainframe operations teams.
“MSM has helped us impose standards for CA mainframe products being put into production. It forces us to better adhere to standards and better consistency. It makes it easier to maintain these systems with fewer people and ensure things are being done correctly.”

“There used to be a separate workflow on the mainframe completing the same task for each of the 10 divisions within the company. We consolidated that to one workflow across the entire company. This has helped improve consistency and accuracy.”

“We can’t make an error with MSM. It is very good for junior people who don’t know the intricacies of mainframes. They cannot violate best practices.”

“The primary function of MSM is to facilitate or expedite SMP/E process. We want to complete installation of base product or add maintenance modules quickly and correctly. We used to have to determine which fixes were applicable for each product. There were many options and it was a complicated decision process. MSM has removed a lot of prep work and eliminated most errors.”

“MSM has a summary of every product and update put on the mainframe. It keeps a log of all activities and settings. It also tells us what the current status is for each product based on everything we did in the past. All of this documentation is stored in one place, which is very handy.”

**Improved IT Security**

The CA Mainframe 2.0 components examined in this study helped the customers interviewed with IT security in several ways: better security-associated proper configurations, automation of some tasks that could have allowed unauthorized users to access sensitive information, and delivery of all updates without the need for hard media. For one customer, some of these issues resulted in security audit points that needed to be fixed. The Health Checker Integration and MVP were instrumental in addressing and fixing security flaws.

“When we completed the Health Check for tape management services (TMS), it flagged some potential security risks. We read through them, discussed with CA, and clearly understood what we need to do to fix the problems.”

“Health Check found a security flaw in how we setup terminal security. We participated in an MVP that was a deep-dive effort to make sure we cleaned up that whole space.”

**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 CA Mainframe 2.0 and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix B).
CA Mainframe 2.0 is a multi-year effort on the part of CA Technologies to provide tools and services so customers can simplify mainframe management and get more value from the platform. This study has focused exclusively on the CA Mainframe Software Manager, Mainframe Value Program, and Health Checker Integration components. By adopting CA Mainframe 2.0, customers will realize additional benefits in the future as more components are released. The CA Mainframe 2.0 Overview section of this study outlines the broader strategy and focus areas for which corresponding solutions will be made available over time.

The four customers interviewed for this study highlighted specific flexibility benefits they anticipate realizing as additional CA Mainframe 2.0 components are released.

- **Greater productivity and consistency from Software Deployment Service.** This is the new major feature of CA MSM r3, released May 2010, and therefore had not been adopted by customers at the time of the interviews though some had participated in the beta tests. This feature of CA MSM will help to ensure that selected products are correctly deployed to selected systems. This will further reduce the time necessary to gather information prior to deployment and the investigation of any problems. “We need to better understand where products are not set up with proper defaults. Being able to see this all in one place will be advantageous. We can see the end game, and we are pretty excited about it.”

- **Specialty processor hardware savings.** CA Mainframe 2.0 will allow companies to better exploit specialty processors such as zIIP and zAAP processors. This can reduce total hardware costs. For some of the companies interviewed, this can translate into substantial savings, given the size of their IT estate.
  
  - “We are looking to offload everything we can to zIIP processors for java. This lines up nicely with the CA Mainframe 2.0 vision.”
  
  - “Once we get a handle on specialty engines, we should see a reduction in number and cost of processors.”

In addition to these examples, CA Mainframe 2.0 has helped create inherently more flexible IT organizations. The time to complete certain mainframe-related tasks has been reduced, as has time-to-market with new services. This allows the mainframe operations team to be more proactive and responsive to business requirements. No flexibility benefits have been included in the ROI analysis portion of this study.

**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 CA Mainframe 2.0 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 CA Mainframe 2.0, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing investment and impact risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by
raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

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

- There were no implementation risks for the CA Mainframe 2.0 components available at the time of writing this study. If CA MSM were to not work properly, a user could revert to the original processes and tools for managing updates. CA MSM is a value-add layer, no functionality or capabilities are removed.

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

- There is a low probability that initial implementation costs could be higher if more time is required to deploy CA MSM.

- There is a low probability that ongoing operations costs could be higher if more time is required to manage the solution because of a lack of skills, a more complex environment, or the need to train more users.

- There is a low probability that a reader’s mainframe operations team savings could be lower if this team is unwilling to fully utilize the new methods to perform updates with CA MSM. The likely cause would be a cultural bias to stay in their comfort zone by continuing to write scripts and following the manually intensive practices of the past.

- There is a medium probability that the application developer productivity gain will not fully be realized if any required effort by the mainframe operations team were handled immediately upon request.

Table 9 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 9
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>Initial implementation labor costs</td>
<td>98%</td>
<td>100%</td>
<td>105%</td>
<td>101%</td>
</tr>
<tr>
<td>Ongoing operations labor costs</td>
<td>98%</td>
<td>100%</td>
<td>105%</td>
<td>101%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe operations team savings</td>
<td>90%</td>
<td>100%</td>
<td>105%</td>
<td>98%</td>
</tr>
<tr>
<td>Application developers productivity gain</td>
<td>80%</td>
<td>100%</td>
<td>103%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

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

The financial results calculated in the Costs and Benefits sections can be used to determine the return on investment, net present value, and payback period for the organization's investment in Mainframe 2.0. These are shown in Table 10 below.

Table 10
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>Present value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>($480)</td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($7,680)</td>
<td>($23,520)</td>
<td>($19,579)</td>
</tr>
<tr>
<td>Benefits</td>
<td>$41,280</td>
<td>$121,280</td>
<td>$161,280</td>
<td>$323,840</td>
<td>$258,931</td>
<td></td>
</tr>
<tr>
<td>Net benefits</td>
<td>($480)</td>
<td>$33,600</td>
<td>$113,600</td>
<td>$153,600</td>
<td>$300,320</td>
<td>$239,352</td>
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<tr>
<td>ROI</td>
<td>1,222%</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Payback period</td>
<td>1 month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.

Table 11 shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 9 in the Risk section to the cost and benefits numbers in Table 10.

Table 11
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>Present value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>($485)</td>
<td>($7,757)</td>
<td>($7,757)</td>
<td>($7,757)</td>
<td>($23,755)</td>
<td>($19,775)</td>
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<tr>
<td>Benefits</td>
<td>$39,014</td>
<td>$117,414</td>
<td>$156,614</td>
<td>$313,043</td>
<td>$250,171</td>
<td></td>
</tr>
<tr>
<td>Net benefits</td>
<td>($485)</td>
<td>$31,258</td>
<td>$109,658</td>
<td>$148,858</td>
<td>$289,288</td>
<td>$230,396</td>
</tr>
<tr>
<td>ROI</td>
<td>1,165%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback period</td>
<td>2 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
Figure 3
Summary Financial Results, Risk-Adjusted

Source: Forrester Research, Inc.
CA Mainframe 2.0: Overview

According to CA Technologies, CA Mainframe 2.0 is its ongoing and evolving mainframe management strategy to maximize platform value and performance, dramatically simplify its management, and provide practical innovation to ensure the mainframe will always be an effective and integral part of an organization’s evolving IT infrastructure. It helps customers address the key challenges of controlling costs, sustaining critical skills, and increasing agility.

Below is some additional information on the CA Mainframe 2.0 components in use by the customers interviewed for this study. For a complete description of CA Mainframe 2.0 and all components, the reader should look at CA Technologies Mainframe 2.0 website2.

CA Mainframe Software Manager

CA Mainframe Software Manager (CA MSM) is a key component of the CA Mainframe 2.0 strategy to help users derive maximum value from their mainframe platform and to change the way they manage the mainframe forever. It provides a set of services that enables both mainframe experts and novices to easily and quickly acquire, install, maintain, and deploy CA Technologies mainframe software. It proactively informs users when updates are available and alleviates JCL and SMP/E complexities. The current release at the time of writing is CA MSM r3, which incorporates the Software Deployment Service. The next major release, expected May 2011, will incorporate the Software Configuration Service.

Mainframe Value Program

The Mainframe Value Program (MVP) helps organizations to obtain greater value out of their existing CA Technologies mainframe solutions. This is achieved by CA Technologies experts reviewing the mainframe portfolio of products and delivering recommendations for:

- Technology and process improvements
- Efficiency and productivity gains
- Cost optimization and savings
- Aligning usage to best support current and future key business initiatives

Health Checker Integration

CA Technologies Health Checks are included in the products and run under IBM’s Health Checker for z/OS. They continuously monitor the active system environment to ensure CA Technologies solutions are optimally configured:

- Validate that best practices are being followed
- Check that recommended product parameter settings are in use
- Monitor product resources to ensure they remain at or below predefined thresholds
- Verify that recent product enhancements are being utilized to ensure maximum return on investment
Appendix A: Composite Organization Description

For this TEI study, Forrester has created a composite organization based on characteristics of the interviewed customers to illustrate the quantifiable costs and benefits of CA Mainframe 2.0. The composite company is intended to represent a large financial services company providing banking and investment services. In addition to the US organization, there are substantial overseas operations. The company runs its core business processes, such as statement generation, financial transaction processing, and billing off of the mainframe.

The mainframe operations team consists of seven members, several of whom are approaching retirement age. In addition, there are 150 developers across multiple divisions and countries working on applications hosted on the mainframe.

In adopting CA Mainframe 2.0, the composite company has the following objectives:

- Reduce the time and effort required to maintain and update CA Technologies mainframe products.
- Decentralize mainframe administration, allowing application developers greater access and to the mainframe.
- Reduce the skill level required by new hires to the mainframe operations team to install updates.

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

<table>
<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.

Appendix D: 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, please see the Risk section of this study.