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**ABOUT FORRESTER CONSULTING**

Forrester provides independent and objective research-based consulting to help leaders deliver key transformation outcomes. Fueled by our customer-obsessed research, Forrester’s seasoned consultants partner with leaders to execute on their priorities using a unique engagement model that tailors to diverse needs and ensures lasting impact. For more information, visit forrester.com/consulting.

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Executive Summary

Artificial intelligence (AI) can be applied anywhere — from simple to complex tasks and from core business operations to customer-facing workstreams. However, enterprises need reliable infrastructure (compute, storage, and networking) to optimize its use and keep AI teams working, not waiting. Organizations can use Dell Validated Designs for AI as the backbone to their AI systems to make IT teams, AI development teams, and AI end users more productive and operationalize AI for real business value.

Dell Technologies Validated Designs for AI enables organizations to accelerate their AI initiatives with a diverse portfolio of solutions curated for individual AI workload requirements. Organizations can save time and effort with architected, tested, and validated solutions bringing together powerful and scalable compute, networking, and storage designed to dynamically fit needs based on specific use cases.

Dell Technologies and AMD commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Validated Designs for AI. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Validated Designs for AI on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed representatives of two Dell Technologies partners and four organizations using Validated Designs for AI with experience using the solution. For the purposes of this study, Forrester aggregated the interviewees’ experiences and combined the results into a single composite organization.

Prior to using Validated Designs for AI, interviewees’ organizations used a mixture of homegrown and legacy systems to accelerate intelligent outcomes. This caused inefficiencies and required frequent reconfigurations as data scaled.

After the investment in Validated Designs for AI, the organizations were able to accelerate innovation and save time, effort, and costs.

KEY FINDINGS

Quantified benefits. Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **A 20% faster time-to-value.** Having tailor-made systems with the optimized compute power necessary to operate AI workloads decreases the amount of time needed to solve problems, work
on projects, train models, and provide service. This enables the composite organization to recognize an additional $17 million in value per year.

**• A 60% decrease in time spent on AI architecture management.** Dell Technologies provides the composite organization with an AI solution built for its needs. This reduces the ongoing support needed for managing architecture configurations, which saves the composite organization $656,300 over three years.

**• A reduction in operating costs resulting in $4.7 million in savings over three years.** Dell Technologies’ AI infrastructure is more efficient than previous solutions the organization had in place, which reduces the organizational spend needed to operate AI environments. The composite organization is able to reduce the required floors space and energy spend by 30% and 35%, respectively, over three years.

**• An up to 30% increase in FTE productivity with an AI solution designed for organizational needs.** Validated Designs for AI enables data scientists/ML experts, data analysts, and other employees using AI in their workstreams to be more productive in their day-to-day responsibilities though improved system uptime. The composite organization saves $8.1 million due to improved efficiencies with Dell Technologies over three years.

**• An 85% reduction in total time spent resolving AI-related help desk tickets.** With a more agile AI solution built for organization-specific use cases, the composite organization experiences a 60% reduction in AI-related tickets and reduces its ticket resolution time but 75%. This saves the composite organization $54,100 over three years.

**Unquantified benefits.** Benefits that are not quantified in this study include:

- **Increased employee satisfaction.** By having hardware benchmarked for the compute, networking, and storage needs of the organization, employees touching AI workstreams could spend more time on value-add work for the organization instead of the baseline system.

- **Improved customer reputation.** With Validated Designs for AI, interviewees’ organizations improved their use of AI in business processes affecting customers. The organizations were able to provide faster and better-quality responses to customer needs and improve their customer interactions.

- **Environmental impacts.** Continuous server optimization in conjunction with the need to order less as businesses scaled enabled the organizations to minimize the infrastructure’s effect on the environment compared to prior solutions.

- **Satisfaction with Dell Technologies.** Interviewees spoke highly of the level of support and guidance that Dell Technologies provides surrounding the implementation on Validated Designs for AI.

**Costs.** Three-year, risk-adjusted PV costs for the composite organization include:

- **AI architecture fees.** The composite pays fees to Dell Technologies for the AI infrastructure itself. Based on the size and configuration of the composite organization’s systems, this costs $19.2 million over three years.

- **Implementation and ongoing management.** Engineers are involved in the deployment and ongoing management of the composite organization’s Validated Designs for AI solution.
This costs the composite $525,900 over three years.

The representative interviews and financial analysis found that a composite organization experiences benefits of $55.76 million over three years versus costs of $19.73 million, adding up to a net present value (NPV) of $36.03 million and an ROI of 183%.

“With the engineering knowledge put into their Validated Designs, the risk of taking on this solution was low, and we knew the payoff would be great.”

VP, information technology, advertising

“The hardware would usually be the problem, but our partnership with Dell Technologies has taken that off the table. With Validated Designs for AI, instead of focusing on the setup, we can focus on developing our AI solution and delivering business value.”

— CTO, software
EXECUTIVE SUMMARY

ROI 183%

BENEFITS PV $55.76M

NPV $36.03M

Benefits (Three-Year)

- Faster time-to-value $42.3M
- Architecture management savings $656.3K
- Operating cost avoidance $4.7M
- Increased FTE productivity $8.1M
- Savings from reduced user support $54.1K
EXECUTIVE SUMMARY

TEI FRAMEWORK AND METHODOLOGY
From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Validated Designs for AI.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Validated Designs for AI can have on an organization.

DUE DILIGENCE
Interviewed Dell Technologies stakeholders and Forrester analysts to gather data relative to Validated Designs for AI.

INTERVIEWS
Interviewed representatives of two Dell Technologies partners and representatives of four organizations using Validated Designs for AI to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION
Designed a composite organization based on characteristics of the interviewees’ organizations.

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.

CASE STUDY
Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester’s TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES
Readers should be aware of the following:
This study is commissioned by Dell Technologies and AMD and is 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 study to determine the appropriateness of an investment in Validated Designs for AI.
Dell 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.
Dell Technologies provided the customer names for the interviews but did not participate in the interviews.
The Dell Validated Designs For AI Customer Journey

Drivers leading to the Validated Designs for AI investment

| Interviews |
|------------|----------------|----------------|---------------------------------|
| Role       | Industry       | Region          | AI use case                     |
| Engineer   | Healthcare     | North America headquarters, global operations | Complete patient visibility from one interface |
| CIO        | Real estate    | APAC operations | Large-scale design studio built on AI and data analytics |
| VP of information technology | Advertising | North America headquarters, global operations | Content recommendation |
| Director of artificial intelligence and advanced computing | Research laboratory | APAC operations | Data analytics, voice recognition, and image recognition research |
| Lead data scientist | IT | North America operations | Help clients implement AI to make better use of their data* |
| CTO        | Software       | North America operations | Help clients implement imaging processing technology* |

* Dell Technologies partner (implements, deploys, and manages AI solutions built using Validated Designs for AI at customers’ organizations).

KEY CHALLENGES

Prior to investing in Dell Validated Designs for AI, the interviewees’ organizations used a myriad of tools throughout their enterprises in an attempt to accelerate intelligent outcomes. However, the organizations experienced a number of pain points with these systems in place. These issues delayed their abilities to promote business growth and created unnecessary inefficiencies.

The interviewees’ organizations struggled with several shared challenges, including:

- **Decentralized and unoptimized environments.** The interviewees’ organizations had numerous systems of data across teams within their organizations. Some used homegrown solutions to garner value from the data, while others used a mix of AI vendors and solutions to drive data insights in their legacy environments. However, both the data systems and the solutions in place to capitalize on that data were often siloed to different parts of the organizations. Without streamlined, overarching, architecture in place designed with organization-specific use cases in mind, it was difficult for the organizations to activate their full spectrums of data and unleash new insights. This led to internal operational inefficiencies and hindered business outcomes.

  “We were housing data in all these different solutions and really had no idea how to make use of it.”

  *Engineer, healthcare*

- **Increasing volume and complexity of data work.** Interviewees’ organizations were constantly growing, and their existing data technologies could not keep up with the volume and complexity of work being done. Existing solutions required expansions of capacity and capability, but scaling operations seemed
infeasible with the decentralized setups of their previous data environments, which further stifled innovation and business growth. The CIO of a real estate organization said: “Business was moving fast, but our existing solution could not keep up with the demand. This caused internal delays which, in turn, caused project delays. It did not reflect well on our business.”

For data analysts, the process of linking data sets across multiple domains to harvest data, discover patterns, and suggest best actions was often fully manual. The engineer at a healthcare organization said: “We used to call our data lake a data swamp because once you threw some data in it, it was really hard to get it out and make sense of it. We have so many stories of data analysts giving up in frustration in trying to find the meaning of our data.”

For end users, they had to access multiple different systems to get the data they needed to do their jobs, and the data was not necessarily uniform across all systems. The engineer at a healthcare organization said call center representatives had to log into 15 different systems to access the customer data they needed, which negatively impacted customer experiences.

“Before using Dell, we had AI systems from multiple different vendors. It made management overhead extremely complicated.”

Director of artificial intelligence and advanced computing, research laboratory

• **IT inefficiencies.** Having disparate systems to unlock data insights organizationwide also created management headaches. The solutions in place required frequent reconfigurations. Additionally, engineers had to follow different protocols to get each system up and running because they came from a multitude of vendors. The lead data scientist at an IT organization said: “When we were dealing with a hodgepodge of solutions, everything seemed like something new we had to learn. We had so many questions on how to set things up, how to train servers, and how to optimize the networking. The overhead was unbelievable.”

• **Slow speed to delivery.** Prior to working with Dell Validated Designs for AI, the organizations’ data scientists and ML experts experienced long delays due to insufficient compute power in their legacy setups. This resulted in extra effort on their end and prolonged the process of recognizing value from the data. The director of artificial intelligence and advanced computing detailed: “We use AI for image and video intelligent recognition, and it requires high computing power. Before, we needed a week to model, and adjustments took another week. The whole model process would take months.”

“Deploying our previous setups was a time sink. It was the worst thing we ever had to deal with. We would spend months trying to get it to work, and then it would work for a day or two before it fell down.”

Lead data scientist, IT
THE DELL VALIDATED DESIGNS FOR AI CUSTOMER JOURNEY

satisfaction. The CIO of a real estate organization said having no centralized system for the data to filter through meant that end users (e.g., designers, engineers, and architects) were making business decisions based on whatever iteration of the data set they had access to. Real estate projects are constantly changing, and inaccuracy of data across all teams led to wastage and project delays.

- **Operational inefficiencies.** Legacy data processing environments took up an inordinate amount of space and required substantial expenditures in power and cooling. The VP of information technology at an advertising organization said, “We needed to be able to optimize our servers so we could waste less on electricity and other server needs as we continue to scale and intake more data.”

“We needed a lot of computing power, but we couldn’t just continue to add servers as global demand grew. We needed to be able to scale our existing resources to improve efficiencies and decrease ongoing costs.”

*VP, information technology, advertising*

**INVESTMENT OBJECTIVES**

The interviewees’ organizations searched for a solution that could:

- Come preconfigured and designed with their specific use cases in mind.
- Help turn data into intelligent insights, drive faster time-to-market, and lead to better business outcomes.
- Provide more computing power alongside simplified management to attain improved performance, agility, scalability, and efficiency.
- Empower users to focus on their core tasks and expedite their speed to delivery.
- Optimize infrastructure as data volume increases.
- Explore new use cases and extend existing ones without concern for the underlying IT infrastructure.

The interviewees’ organizations selected Dell Validated Designs for AI due to the ability to have a preconfigured and engineering-certified AI solution optimized for their needs.

**“I wanted our IT team to spend less time on managing our infrastructure and more time on doing to fun part: innovating to create additional value.”**

*CTO, software*

**COMPOSITE ORGANIZATION**

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four interviewees from nonpartner organizations, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

*Description of composite.* The composite organization generates $10 billion in annual revenue.
and has 10,000 employees, a strong brand, and global operations. It employs a team of 100 ML engineers/data scientists, 20 data analysts and six IT support staff members dedicated to data and AI systems. Additionally, 500 end users feel the effects of deploying AI within their workstreams. Of the organization’s new annual revenue, $1 billion is related to improved efficiencies and productivities garnered through using AI to make faster and better data-driven decisions.

Prior to investing in Dell Validated Designs for AI, the organization housed a number of homegrown data analytic solutions as well as AI solutions built by other vendors. The composite organization was looking to transition to a centralized AI environment in which users could manage and leverage the full spectrum of data within the organization in a simplified manner.

As part of its environment, the organization has an annual lease obligation of $5 million, and power and cooling costs of $2.5 million.

Key Assumptions
- $1 billion in revenue associated with processes affected by AI
- 6 IT AI support staff
- 100 ML engineers/data scientists
- 20 data analysts
- 500 AI end users

“With Validated Designs for AI, we have an end-to-end, preconfigured AI solution that incorporates key partnerships with other companies. With GPU servers on the back end and working applications on the front end, [the solution] is optimized for all users.”

— CIO, real estate
Analysis Of Benefits

Quantified benefit data as applied to the composite

**Total Benefits**

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Benefit</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>Atr</td>
<td>Faster time-to-value</td>
<td>$17,000,000</td>
<td>$17,000,000</td>
<td>$17,000,000</td>
<td>$51,000,000</td>
<td>$42,276,484</td>
</tr>
<tr>
<td>Btr</td>
<td>Architecture management savings</td>
<td>$263,915</td>
<td>$263,915</td>
<td>$263,915</td>
<td>$791,744</td>
<td>$656,316</td>
</tr>
<tr>
<td>Ctr</td>
<td>Operating cost avoidance</td>
<td>$1,543,750</td>
<td>$1,900,000</td>
<td>$2,256,250</td>
<td>$5,700,000</td>
<td>$4,668,811</td>
</tr>
<tr>
<td>Dtr</td>
<td>Increased FTE productivity</td>
<td>$3,258,000</td>
<td>$3,258,000</td>
<td>$3,258,000</td>
<td>$9,774,000</td>
<td>$8,102,164</td>
</tr>
<tr>
<td>Etr</td>
<td>Savings from reduced user support</td>
<td>$21,751</td>
<td>$21,751</td>
<td>$21,751</td>
<td>$65,254</td>
<td>$54,092</td>
</tr>
<tr>
<td></td>
<td>Total benefits (risk-adjusted)</td>
<td>$22,087,416</td>
<td>$22,443,666</td>
<td>$22,799,916</td>
<td>$67,330,997</td>
<td>$55,757,867</td>
</tr>
</tbody>
</table>

**FASTER TIME-TO-VALUE**

**Evidence and data.** Interviewees noted that AI workloads require high performance compute and storage to rapidly manage and analyze organizational data in order to drive faster insights and enable a competitive advantage. Having AI infrastructure benchmarked to their organizations’ needs with Validated Designs for AI enabled them to pool their data together across the enterprise and analyze and interpret more data faster with richer context. This, in turn, enabled data users to run more experiments and train models more quickly with improved success and access the most up-to-date data when they needed it. The acceleration of data analysis with larger data sets and improved accuracy enabled the organizations to recognize value at a faster rate through increased efficiencies and improved service.

- The CIO of a real estate organization said their company uses an end-to-end AI solution through Dell Technologies as the backbone of its design studio. Their organizationwide solution connects data across the enterprise, which decreases siloes across project teams and ensures everyone has access to the same data for the planning, implementation, and deployment of the organization’s real estate projects. Prior to using Dell Validated Design for AI, changes in a design aspect, for instance, could not be automatically reported to the full project team consisting of a wide variety of roles. This created project delays, construction errors, and person-hour and material wastage, resulting in millions of dollars lost. With its AI solution in place through Validated Designs, team performance and business grew fourfold. The CIO said, “We have been able to decrease the time it takes to complete projects by 25% with an almost 0% margin of error.” The organization

“With a high-quality stack that is reliable and consistent, we can accelerate the timeline of bringing insights to the business.”

*Lead data scientist, IT*
is now able to tackle double the number of projects per year with the same number of people compared to its previous environment.

“If you commit to a timeline of three years and deliver in two, your brand value increases. You save time and costs on the project in motion, while also potentially driving new business.”
_CIO, real estate_

• The VP of information technology in advertising said their firm uses its AI deployment with Dell Technologies for inferencing and real-time content recommendations. They explained: “AI is a significant part of our business in terms of our ability to create revenue. With our inferencing solution (created with Dell Technologies), we are able to optimize our data and cut the amount of effort needed to use it while gathering deeper insights for our customers. We can serve clients faster with better recommendations, driving higher revenue and faster growth.”

• The director of artificial intelligence and advanced computing at the research laboratory said their organization uses its AI setup with Validated Designs for deep learning research. They said: “We use [our Dell AI architecture] for image and video intelligent recognition. Before, we needed a week to generate a model on our non-GPU (graphics processing unit) servers from other vendors. And if the researchers needed to adjust the model, it required another week. If we wanted a perfect model, it required one to two months in many cases. Now, by working with Dell Technologies and creating an AI environment using GPU-accelerated servers, we can generate a model within two to three days. So, in the long run, we can generate scientific results sooner.”

• The engineer in healthcare said their organization created an enterprisewide AI solution on Dell Technologies architecture that links data sets across multiple domains for data analysts to harvest the data, find patterns, and suggest next steps to customers. The organization improved its model success rate by 15%, and, in turn, drove deeper insights faster and improved customer service.

“Our [Dell Technologies] servers let us serve more clients faster with better results. To do that with the same investment in hardware is a great win.”
_VP, information technology, advertising_

Modeling and assumptions. For the composite organization, Forrester assumes:

• The composite organization uses its AI solution built using Dell Validated Designs for AI to augment internal productivity, develop new projects, complete projects faster, and leverage data to improve customer experience. This allows the organization to stay competitive in its market and continue to expand.

• The composite organization generates $1 billion annually through its AI-informed initiatives.
ANALYSIS OF BENEFITS

- Optimized, preconfigured AI architecture with Dell Validated Designs enables the composite organization to analyze continuously expanding data sets faster, accelerating timelines to business value by 20%.
- The composite organization has an average operating margin of 10%.

**Risks.** Faster time-to-value may vary depending on the following:

- The particular AI use case(s).
- The size, scope, and complexity of the AI use case(s).

**Results.** To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $42.3 million.

<table>
<thead>
<tr>
<th>Faster Time-To-Value</th>
<th>Ref.</th>
<th>Metric</th>
<th>Source</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Value unlocked through AI initiatives</td>
<td>Composite</td>
<td>$1,000,000,000</td>
<td>$1,000,000,000</td>
<td>$1,000,000,000</td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Acceleration factor from Dell Validated Designs for AI</td>
<td>Interviews</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Operating margin</td>
<td>TEI standard</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>At</td>
<td>Faster time-to-value</td>
<td>A1<em>A2</em>A3</td>
<td>$20,000,000</td>
<td>$20,000,000</td>
<td>$20,000,000</td>
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</tr>
<tr>
<td>Risk adjustment</td>
<td>↓15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atr</td>
<td>Faster time-to-value (risk-adjusted)</td>
<td></td>
<td>$17,000,000</td>
<td>$17,000,000</td>
<td>$17,000,000</td>
<td></td>
</tr>
</tbody>
</table>

Three-year total: $51,000,000  
Three-year present value: $42,276,484

ARCHITECTURE MANAGEMENT SAVINGS

**Evidence and data.** Optimizing AI infrastructure with Validated Designs for AI reduced the support requirements for IT teams at the interviewees’ organizations. Having custom-built AI solutions from a trusted provider decreased the ongoing configuration effort for their workloads as they expanded deployment when compared to previous AI technologies.

- The CIO of a real estate organization said their business was able to decrease management of its AI architecture by 70%. They said: “It’s designed correctly, implemented successfully, and runs properly. It’s really simple to expand deployment and upkeep what we already have.”
- The VP of information technology in advertising said their organization was able to cut ongoing configuration time by 50%. Now the organization spends 2 to 3 hours per server on installation, saving it months of work. Additionally, affected engineers can now reallocate their time to more value-add work. The VP noted, “Our IT team actually has time to work on other projects now
instead of being consumed by the infrastructure of one project and stopping everything else.”

- The director of artificial intelligence and advanced computing at the research laboratory said their organization has a small team of engineers that both manages and uses its AI solution to conduct research. The director said: “There are three parts of AI research: data, algorithms, and computing power. Traditionally, our engineers have been responsible for designing good algorithms. However, to design a good algorithm, it requires strong computing power. Before using Dell Technologies, the engineers needed to build this out, and it is not where their strengths lay. To complete a configuration for one server, it could require more than a week of our engineers’ time. This is where Dell comes into the picture. It provided professional help in hardware and software configuration which ensured a good computing environment so our engineers can focus on algorithm design instead of the operations.”

- The CTO in software said their organization uses Validated Designs for AI to deploy and manage its solution at other organizations. The organization was able to save hours per week for ongoing management of the solution at customers’ organizations.

“Everything is prebaked with the server configurations, and the networking aspect is pretested to ensure it can accept more servers as we expand deployment. We could be proactive [with Validated Designs for AI] and save a lot of work and headache.”

VP, information technology, advertising

Modeling and assumptions. For the composite organization, Forrester assumes:

- The composite organization previously had six engineers spend 70% of their time supporting its AI environment before the investment in Validated Designs for AI.

- With the Dell Technologies investment, the six engineers are able to reduce the time spent managing the AI environment by 60%.

- The hourly rate of an engineer FTE is $53.

Risks. Architecture management savings may vary depending on the following:

- Size, scope, and complexity of deployment.

- Size, scope, and complexity of prior state deployments.

- The hourly rates of an engineer FTE.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $656,300.
ANALYSIS OF BENEFITS

ARCHITECTURE MANAGEMENT SAVINGS

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Source</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Engineering FTEs involved in architecture planning, configuration, and deployment</td>
<td>Composite</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>B2</td>
<td>Proportion of time spent on architecture management per FTE</td>
<td>Interviews</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>B3</td>
<td>Time required for architecture management without Dell Validated Designs for AI (hours)</td>
<td>B1<em>B2</em>2,080 hours</td>
<td>8,736</td>
<td>8,736</td>
<td>8,736</td>
</tr>
<tr>
<td>B4</td>
<td>Reduction in time spent on architecture management with Dell Validated Designs for AI</td>
<td>Interviews</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>B5</td>
<td>Engineer FTE hourly rate (fully burdened)</td>
<td>Composite</td>
<td>$53</td>
<td>$53</td>
<td>$53</td>
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<tr>
<td>Bt</td>
<td>Architecture management savings</td>
<td>B3<em>B4</em>B5</td>
<td>$277,805</td>
<td>$277,805</td>
<td>$277,805</td>
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<td>↓5%</td>
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<td></td>
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<tr>
<td>Btr</td>
<td>Architecture management savings (risk-adjusted)</td>
<td></td>
<td>$263,915</td>
<td>$263,915</td>
<td>$263,915</td>
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</tbody>
</table>

Three-year total: $791,744

Three-year present value: $656,316

OPERATING COST AVOIDANCE

Evidence and data. Interviewees noted that their organizations’ older AI and data analytics systems were not fully optimized for their needs. As a result, they were less efficient in both floorspace and energy consumption.

By implementing AI solutions with Validated Designs, the organizations had access to servers with denser clusters. In addition, the organizations could use the same servers interchangeably for different needs. As they expanded their deployments over time, the organizations were able to better utilize existing servers and, in turn, decrease additional server spend. With Dell Technologies, the organizations could easily scale computing power to meet business performance demands while taking up less floorspace and power and cooling energy consumption.

Modeling and assumptions. For the composite organization, Forrester assumes:

- The composite organization maintains multiple data centers globally with floor space allocated for AI hardware. In deploying an AI environment designed for its needs with Validated Designs, the composite organization reduces the floor space required for AI hardware by up to 30%.

“We could only get the level of density we needed with Dell’s high-density servers. Without them, we wouldn’t be able to really utilize space, powering, networking, and resources in the same way we can now.”

VP, information technology, advertising
over three years and reduce the power and cooling spend by 35% over the same time period.

- The composite organization has average annual lease obligations of $5 million for its AI hardware. This is reduced over time as legacy hardware is retired.
- The composite organization has an average energy spend of $2.5 million from its AI environment. This is reduced over time as legacy hardware is retired.

**Risks.** Operating cost avoidance may vary depending on the following:

### Operating Cost Avoidance

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Source</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Average annual lease spend for AI in legacy environment</td>
<td>Composite</td>
<td>$5,000,000</td>
<td>$5,000,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>C2</td>
<td>Reduction in required floor space with Dell</td>
<td>Interviews</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Dell Technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>Average annual power and cooling spend in legacy environment</td>
<td>Composite</td>
<td>$2,500,000</td>
<td>$2,500,000</td>
<td>$2,500,000</td>
</tr>
<tr>
<td>C4</td>
<td>Reduction in spend due to server optimization with Dell</td>
<td>Interviews</td>
<td>25%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ct</td>
<td>Operating cost avoidance</td>
<td>(C1<em>C2)+(C3</em>C4)</td>
<td>$1,625,000</td>
<td>$2,000,000</td>
<td>$2,375,000</td>
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<tr>
<td></td>
<td>Risk adjustment</td>
<td>↓5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ctr</td>
<td>Operating cost avoidance (risk-adjusted)</td>
<td></td>
<td>$1,543,750</td>
<td>$1,900,000</td>
<td>$2,256,250</td>
</tr>
</tbody>
</table>

Three-year total: $5,700,000  
Three-year present value: $4,668,811

### INCREASED FTE PRODUCTIVITY

**Evidence and data.** Besides increasing efficiencies within the IT teams at the interviewees’ organizations, using an AI solution designed and benchmarked for specific use cases built with Validated Designs resulted in productivity improvements for data scientists/ML experts, data analysts, and data users.

Data scientists/ML experts and data scientists were able to analyze data sets faster and spend more time on value-creating activities instead of completing mundane tasks and waiting for results.

- The engineer in healthcare said data analysts at their organization previously spent 80% of their time trying to consolidate data to extract insights in the prior state. With access to all the data on one solution, conducting data analytics — a task that previously took three to six months to complete — now takes 30 minutes. The engineer said, “We no longer had to manually align data
ANALYSIS OF BENEFITS

codes across different systems because we have automated the process of loading it, validating it, and connecting it in the same solution where we act on it.”

- The engineer in healthcare said their organization brought down its proof of value for its predictive models from three months to two weeks with its AI solution built with Validated Designs. Having access to data and the rules to execute on that data in one system with optimized compute power enabled data scientists to draw insights with less downtime.

- The lead data scientist at an IT organization said their business was able to save two to three months on model training, deploying, and testing for end customers using Validated Designs for AI. The interviewee said: “We now have access to the compute and high-speed storage we need for our clients. It used to take us three days to turn around results. Now it takes us a day. Therefore, we are iterating on models three times faster [than in our prior state]. It now takes us a month to get out models to where we need them to be.”

- The director of artificial intelligence and advanced computing at a research laboratory said, “Our scientists and researchers can spend more time on research and improve the iteration of science.”

Interviewees’ organizations also automated tasks and experienced less downtime within their AI environments, which saved time for data/AI end users.

- The engineer in healthcare said contact center agents at their organization now have access to a unified view of patient data instead of having to manually pull it from multiple different portals while on a call. The engineer said, “Agents now just have to log into one screen, and they see an incredible timeline of every interaction we have had with the patient in less than 30 milliseconds.” Having holistic visibility into customer data from one touchpoint decreased call times by 30% for contact center agents, allowing them to optimize their time and communicate with more customers in the same time period.

- The CIO in real estate said designers at their organization can create blueprints 20% faster in the current AI environment compared to the previous setup. With Validated Designs for AI, the organization’s back-end architecture is optimized for the compute and performance needs of its 3D design applications, decreasing system downtime and latency.

“We’ve been able to deepen the work we can do with the data and cut the amount of time it takes to work with it.”

*Engineer, healthcare*

“Our machines used to be slow, and sometimes they wouldn’t even work. With Dell Technologies, we were able to implement servers with GPUs. Now, our designers can utilize the full 8 hours of their day instead of 6.”

*CIO, real estate*
**Modeling and assumptions.** For the composite organization, Forrester assumes:

- The composite organization employs a team of 100 data scientists/ML experts and 20 data analysts. Additionally, 500 data/AI end users feel the downstream effects of utilizing AI in their workstreams.

- With a personalized AI solution through Validated Designs for AI, data scientists/ML experts save 30% of their time creating models and waiting on results or other low-value tasks related to working with the organization’s data.

- The average fully burdened salary of a data scientist/ML expert is $150,000.

- Data analysts save 20% of their time with improved data reconciliation across multiple sources and efficiencies in analyzing data sets by having an organizationwide AI solution built with Dell Technologies.

- The average fully burdened salary of a data analyst is $60,000.

- End users save 10% of their time on their tasks using automation with their AI solution to access the data they need from across the enterprise.

- The average fully burdened salary of a data user is $50,000.

- Forrester conservatively estimates that 50% of the total time saved per FTE is applied directly back to value-generating tasks, and it is therefore included in the benefit calculation. Individual employees may apply additional time savings toward professional development, training, and work-life activities that are not included in the benefit analysis.

**Risks.** Increased FTE productivity may vary depending on the following:

- The particular AI use case(s).

- The size, scope, and complexity of AI use case(s).

- Prior state benchmarks.

- The fully burdened salaries of the affected users.

- The percent of productivity captures the affected users.

**Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $8.1 million.
Savings from Reduced User Support

Evidence and data. By building their AI workloads on pre-designed, tested, and optimized architecture with Validated Designs for AI, the interviewees’ organizations saw efficiencies within their IT ticketing systems.

Dell Technologies provided the organizations with an AI solution benchmarked to their needs in terms of compute, networking, and storage. As a result, AI and data users experienced less latency, downtime, and overall delays in their work environments.

Additionally, if there are still issues, it is faster and easier to resolve them due to the simplified infrastructure and a centralized AI environment.

With a more reliable and powerful AI solution, the organizations were able to reduce the number of AI-related help desk tickets and decrease ticket-resolution times.

Modeling and assumptions. For the composite organization, Forrester assumes:
ANALYSIS OF BENEFITS

- In its prior environment, the composite organization received 20 AI/data environment-related tickets per month. On average, it took 2 hours for engineers to investigate and resolve a ticket.

- Once implementing Validated Designs as the backbone to its AI environment, the composite organization reduces the number of AI-related tickets by 60%. Additionally, it takes engineering 30 minutes to resolve the remaining tickets.

- The hourly rate of an engineer FTE is $53.

**Risks.** Savings from reduced user support may vary depending on the following:

- The number and complexity of user-related tickets in the organization’s prior AI environment.

- The hourly rate of an engineer FTE.

- The size and scope of adoption of Validated Designs for the organization’s AI workloads.

**Results.** To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $54,100.

> “We used to receive 10 to 20 tickets daily in our design department for problems related to slow applications or not being able to access the necessary data. And our engineers would spend 2 to 3 hours to figure out where the issue was. Most of these issues have disappeared once we transitioned to Validated Designs for AI.”

*CIO, real estate*

<table>
<thead>
<tr>
<th>Savings From Reduced User Support</th>
<th>Metric</th>
<th>Source</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Average number of tickets per year in legacy AI environment</td>
<td>Composite</td>
<td>240</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>E2</td>
<td>Average time to resolve a ticket (hours)</td>
<td>Interviews</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
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<tr>
<td>E3</td>
<td>Engineer FTE hourly rate (fully burdened)</td>
<td>Composite</td>
<td>$53</td>
<td>$53</td>
<td>$53</td>
</tr>
<tr>
<td>E4</td>
<td>Subtotal: Cost resolving support tickets in legacy environment</td>
<td>$E1\times E2\times E3</td>
<td>$25,440</td>
<td>$25,440</td>
<td>$25,440</td>
</tr>
<tr>
<td>E5</td>
<td>Reduction in number of tickets per year in Dell environment</td>
<td>Interviews</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>E6</td>
<td>Average time to resolve a ticket (hours)</td>
<td>Interviews</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>E7</td>
<td>Subtotal: Cost resolving support tickets in Dell environment</td>
<td>$E1\times (1-E5)\times E6\times E3</td>
<td>$2,544</td>
<td>$2,544</td>
<td>$2,544</td>
</tr>
<tr>
<td>Et</td>
<td>Savings from reduced user support</td>
<td>E4-E7</td>
<td>$22,896</td>
<td>$22,896</td>
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<tr>
<td>Etr</td>
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<td></td>
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<tr>
<td></td>
<td>Savings from reduced user support (risk-adjusted)</td>
<td></td>
<td>$21,751</td>
<td>$21,751</td>
<td>$21,751</td>
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<td></td>
<td>Three-year total: $65,254</td>
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<td></td>
<td>Three-year present value: $54,092</td>
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</tbody>
</table>
UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Increased employee satisfaction.** Interviewees collectively mentioned that employees associated with AI use cases and workstreams — IT, data analysts, data analysts, and end users feeling the effects of using AI within the organization — were more satisfied in the organization’s AI environment once adopting Validated Designs for AI than in the prior state. Users were able to spend more time on true knowledge work, additional projects, and future innovation now that they had a dependable, easy-to-use solution driving their AI initiatives. The lead data scientist at an IT organization said: “Our teams no longer complain about the hardware. Instead, they’re able to just do their jobs and focus on what they enjoy doing and what they would like to do next.”

- **Improved customer reputation.** For organizations using AI in customer-facing use cases, the stability offered through Validated Designs for AI ensures these workstreams stay efficient and running, even as business and organizational data scales. The engineer in healthcare said rapid and high-quality customer service was important for their organization’s patient interactions. Once implementing its AI solution built with Validated Designs, call center agents have access to the full portfolio of a patient’s data at their fingertips, improving their customer interactions. As a result, the organization’s Net Promoter ScoreSM (NPS) increased by 15%.³

- **Environmental impacts.** By optimizing servers with Dell, ordering less as business scales, and, in turn, reducing energy costs associated with AI infrastructure, interviewees’ organizations could be greener and decrease their impacts on the environment. The VP of information technology at an advertising organization said: “At the scale of servers we buy, just a one-watt reduction in electricity per server is greener for the environment and better for our children. And Dell Technologies can do that without sacrificing performance.”

- **Satisfaction with Dell Technologies.** Validated Designs for AI served as a reliable, high-performing, agile backbone to working with data and driving actionable insights. All interviewees noted the value their organizations saw from having Dell Technologies’ as a trusted partner for their AI environments.

“With Dell Technologies, we see a lot of love and care going into the design and creation of their solutions. And the willingness to work with clients to better support client needs and custom use cases is really what sets [Dell] apart from other vendors.”

VP, information technology, advertising

“Our Dell solution is very easy to use for AI researchers. Even for students who just started AI research, they can learn quickly in one to two weeks.”

Director of artificial intelligence and advanced Computing, research laboratory
ANALYSIS OF BENEFITS

- The CIO at a real estate organization said: “Dell had a bundled solution including multiple parts from different providers that could be put together and optimized for what we needed. [In our prior state,] we had to coordinate across vendors and configure ourselves. There was a lot of back and forth, errors, and stress. With Dell Technologies, we only really needed to interact with one person within Dell Technologies, and they took care of everything.”

- The engineer at a healthcare organization said, “Dell Technologies is really open to working with us and helping us find and define what we need.”

FLEXIBILITY

The value of flexibility is unique to each customer. Scenarios in which a customer might implement Validated Designs for AI and later realize additional uses and business opportunities include:

- **Expanding use.** Interviewees expressed interest in expanding usage of AI within their organizations with Validated Designs for AI and noted that the ease of scale the solution offers makes this goal attainable. According to interviewees, data scientists and data analytics teams now have the freedom to explore new use cases or extend existing ones without concern for the underlying IT infrastructure because it’s optimized for scale.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

“Validated Designs for AI allows us to move fast and be agile.”

_Lead data scientist, IT_

“When I get a Dell server in, my focus is, ‘Okay, let’s set this up to run and train some models.’ It isn’t, ‘Let’s figure out how to make this trombone play a tune at all.’ We can focus on what actually drives value for the business as opposed to tuning the guitar so it could play at all.”

— CTO, software
Analysis Of Costs

Quantified cost data as applied to the composite

<table>
<thead>
<tr>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref.</td>
</tr>
<tr>
<td>Ftr</td>
</tr>
<tr>
<td>Gtr</td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

AI ARCHITECTURE FEES

Evidence and data. While having their compute, networking, and storage solutions architected, tested, and validated for AI through Dell Technologies was free, the interviewees’ organizations paid fees for the infrastructure itself. Dell Technologies offers a variety of pricing models that vary widely, based on the scope, usage, and design of specific AI systems.

Modeling and assumptions. For the composite organization, Forrester assumes:

- The composite organization spends $10 million upfront for AI architecture.
- Once deployed, the organization spends $3 million annually for upgrades and additional infrastructure.

Risks. AI architecture fees may vary depending on the following:

- The size of the organization and use cases being targeted.
- The specific AI deployment, in terms of infrastructure needed, and terms of contract.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $19.2 million.

<table>
<thead>
<tr>
<th>AI Architecture Fees</th>
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</thead>
<tbody>
<tr>
<td>Ref.</td>
</tr>
<tr>
<td>F1</td>
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<tr>
<td>F2</td>
</tr>
<tr>
<td>Ft</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Ftr</td>
</tr>
</tbody>
</table>

Three-year total: $20,900,000  Three-year present value: $19,206,612
IMPLEMENTATION AND ONGOING MANAGEMENT

Evidence and data. Interviewees described how much easier implementation, deployment, and ongoing management was with Validated Designs for AI compared to prior solutions and doing it themselves.

- The VP of information technology in advertising said their organization was able to save more than three months of work around network planning and configuration and a month or two around initial server configurations when compared to doing it themselves. The VP said, “We saw so much effort saved from being able to pre-identify configuration issues with Dell compared to us setting up the infrastructure from scratch and discovering problems after installation.”

- The CIO at a real estate organization cited Dell Technologies’ partnerships as a game-changer: “If we had to design the solution ourselves and coordinate across multiple vendors, we would be investing double in terms of man hours and costs.”

- The director of artificial intelligence and advanced computing at a research laboratory said server configuration at their organization used to take more than a week. With Validated Designs for AI, that has been reduced to hours.

- The lead data scientist at an IT organization that uses Validated Designs for AI to deploy AI solutions at its customers’ organizations was able to deploy solutions five months faster compared to with its previous AI architecture solution using the same number of resources.

- The CTO of a software organization said their business uses Validated Designs for AI to deploy its solution at other organizations. The organization was able to save hours per week on server configurations.

Modeling and assumptions. For the composite organization, Forrester assumes:

- Three engineers dedicate 50% of their time during the initial three-month implementation period.

- Six engineers dedicate 28% of their time per year to ongoing management and maintenance of the

“Having servers pre-fit for maximum performance with custom settings was an easy win for us. This saved us months of work.”

VP, information technology, advertising

“The ability to get the system preconfigured and preoptimized for specific use cases saved us hours of work per server.”

Lead data scientist, IT
solution. (This value is calculated based on numbers in Benefit B).

- The average fully burdened salary of an engineer is $110,000.

**Risks.** Implementation and ongoing management may vary depending on the following:

- The size, scope, and complexity of operations.
- The available capacity and skill set of teams.
- The salaries of FTEs.

**Results.** To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of $525,900.

>“The thing I like best with [Validated Designs for AI] is you don’t have to worry about the power supply going underpowered. I don’t need to worry that any of the components won’t work with each other. Everything has been sourced properly and tested.

*CTO, software*

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### Implementation And Ongoing Management

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Metric</th>
<th>Source</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Engineer FTE involved in implementation and ongoing management</td>
<td>Composite</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>G2</td>
<td>Time dedicated by engineering FTEs (months)</td>
<td>Interviews</td>
<td>3</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>G3</td>
<td>Percent of engineering FTEs' time dedicated to implementation</td>
<td>Interviews</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Percent of engineering FTEs' time dedicated to ongoing management</td>
<td>70%-(B2*B4)</td>
<td>28%</td>
<td>28%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Engineering FTE annual salary (fully burdened)</td>
<td>Composite</td>
<td>110,000</td>
<td>$110,000</td>
<td>$110,000</td>
<td>$110,000</td>
</tr>
<tr>
<td>Gt</td>
<td>Implementation and ongoing management</td>
<td>G1<em>G2</em>G3*(G5/12 months)+G1<em>G2</em>G4*(G5/12 months)</td>
<td>$41,250</td>
<td>$184,800</td>
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<tr>
<td>Gtr</td>
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<td>↓5%</td>
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<tr>
<td>Gtr</td>
<td>Implementation and ongoing management (risk-adjusted)</td>
<td>$43,313</td>
<td>$194,040</td>
<td>$194,040</td>
<td>$194,040</td>
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</tr>
</tbody>
</table>

**Three-year total: $625,433**  
**Three-year present value: $525,861**
Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI and NPV for the composite organization’s investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI and NPV values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

<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>
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</thead>
<tbody>
<tr>
<td>Total costs</td>
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<td>($3,494,040)</td>
<td>($3,494,040)</td>
<td>($3,494,040)</td>
<td>($21,525,433)</td>
<td>($19,732,473)</td>
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<tr>
<td>Total benefits</td>
<td>$0</td>
<td>$22,087,416</td>
<td>$22,443,666</td>
<td>$22,799,916</td>
<td>$67,330,997</td>
<td>$55,757,867</td>
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<tr>
<td>Net benefits</td>
<td>($11,043,313)</td>
<td>$18,593,376</td>
<td>$18,949,626</td>
<td>$19,305,876</td>
<td>$45,805,565</td>
<td>$36,025,394</td>
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<tr>
<td>ROI</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>183%</td>
</tr>
</tbody>
</table>
Appendix A: Total Economic Impact

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.

TOTAL ECONOMIC IMPACT APPROACH

**Benefits** represent the value delivered to the business by the product. The TEI methodology places 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.

**Costs** consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

**Flexibility** represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

**Risks** measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on “triangular distribution.”

**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.

**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.

**RETURN ON INVESTMENT (ROI)**

A project’s expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

**DISCOUNT RATE**

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

**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.

The initial investment column contains costs incurred at “time 0” or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in 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.
Appendix B: Endnotes


2 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.

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