Dell Technologies Accelerates AI Model Generation Efficiency And Allows Scientists To Focus On Research

The emergence of artificial intelligence and its myriad applications has created demand for reliable and easy-to-use environments in both the private and public sectors where organizations are exploring how to leverage AI.
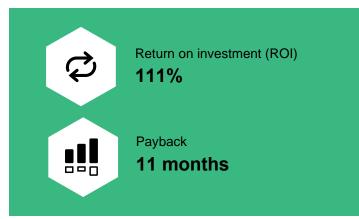
Dell Technologies Validated Designs enable organizations to accelerate their science, engineering, analytics, and AI initiatives with a diverse portfolio of products and services curated for individual workload requirements. The portfolio contains a wide selection of price and performance optimized hardware, management and orchestration software, and domain-specific services.

To better understand the benefits, costs, and risks associated with Dell Technologies Validated Designs, Dell Technologies and Intel commissioned Forrester Consulting to interview four decision-makers and conduct a Total Economic Impact™ (TEI) study.[1]

This abstract will focus on a national laboratory using Dell Technologies to further its artificial intelligence research.

AI RESEARCH USE CASE

Forrester interviewed the director of artificial intelligence and advanced computing at a national laboratory in China. The organization has more than 2,000 researchers, of which 200 actively use Dell Technologies to conduct research with deep learning workloads. The organization's research is wide-ranging from data analytics to voice and image recognition.

Return on investment (ROI)
111%

Payback
11 months

CHALLENGES

The interviewee noted the laboratory faced the following challenges, limiting its ability to perform AI research tasks:

- **Decentralized and unoptimized environment.** Prior to deploying Dell Technologies, the national laboratory used a mixture of vendors and solutions, which caused inefficiencies and required frequent configurations. Maintaining the environment distracted users from their core research. The director of artificial intelligence and advanced computing explained: "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 Dell HPC [high-performance computing], 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."

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- **Slow environments not providing adequate computing power for complex work.** Prior to working with Dell Technologies, the organization's users experienced long delays due to low compute power. Low computing power severely prolonged the process of iterating on research models. The director of artificial intelligence and advanced computing detailed: "We use HPC for image and video intelligent recognition, and it requires computing power from HPC. Before, we needed a week to a model on non-GPU [graphics processing unit] HPC, and if the researchers needed to adjust the model, it required another week. If we wanted to get a perfect model, it required one to two months in many cases."

> **"Dell HPC 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, national laboratory.*

KEY RESULTS

Faster time-to-value. Having tailor-made systems with increased compute power decreases the amount of time needed to solve problems, run experiments, and train models. Faster data throughput allowed the organization to accelerate the time-to-market for new products and services underpinned by research.

The director of artificial intelligence and advanced computing stated: "Now with Dell HPC, we can generate a model within two to three days. So, in the long run, we can generate scientific results sooner."

Increased research efficiency. Improved computing power enabled the organization to run models faster and allowed researchers and staff to spend more time on value-creating activities instead of waiting for

results. Furthermore, the Dell Technologies solutions designed and benchmarked for specific use cases resulted in researchers spending less time on configuration.

The director of artificial intelligence and advanced computing said, "Our scientists and researchers can spend more time on research and improve the iteration of science."

Reduced engineering time. Dell Technologies provided the organization with systems built for its range of specific use cases as well as ongoing support from its HPC and AI Centers of Excellence. With the right tools and expert support, the organization required less internal support than it needed with previous homegrown solutions.

The director of artificial intelligence and advanced computing explained: "[Dell] provided professional services in hardware and software configuration which ensured a good computing environment so our engineers can focus on algorithm design instead of the operations."

Operating cost savings. Dell's systems were more efficient than previous solutions, requiring less floorspace for hardware and consuming less energy for power and cooling. Having more efficient systems reduced organizational spend needed to operate the environments**.**

TOTAL ECONOMIC IMPACT ANALYSIS

For more information, download the full study: "The Total Economic Impact™ Of Dell EMC Ready Solutions For HPC," a commissioned study conducted by Forrester Consulting on behalf of Dell, April 2020.

STUDY FINDINGS

Forrester interviewed four decision-makers at organizations with experience using the Ready Solutions for HPC and combined the results into a three-year composite organization financial analysis. Risk-adjusted present value (PV) quantified benefits include:

- 4x increase in compute power.

- 15% acceleration in research value recognition.

- 25% reduction in required support.

Return on investment (ROI)

111%

Net present value (NPV)

$32 million

Appendix A: Endnotes

[1] 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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