

## **AI in the Enterprise: Prepare for Impact**

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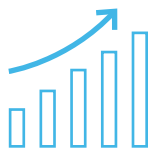
How businesses optimized for AI are seizing opportunities and driving growth





## Table of Contents

- Introduction
- The Evolution of AI, Machine Learning, and Deep Learning
- Transforming Business with AI Initiatives
- Optimizing Infrastructure for Greater AI Value
- Keeping Your AI Workloads Safe and Secure
- Simplify Your AI Journey with Dell Technologies and AMD
- Turn AI Possibilities into Reality



**According to Gartner, global AI-derived business value will reach nearly \$3.9 trillion by 2022.<sup>1</sup>**

## Introduction

Artificial intelligence (AI) holds incredible promise for today's enterprises, given its power to unlock valuable insights from mountains of data. Yet most companies (80-85%) are stuck in the AI experimentation stage, with efforts siloed within departments or teams—and lacking any tie to key business objectives.<sup>1</sup> It takes a clearly defined AI strategy, backed by the right business processes and IT infrastructure, to truly maximize AI investments.

But what's the big deal about AI anyway? Hasn't it been around for years? AI, machine learning (ML), and deep learning (DL) technologies are rapidly converging, due to multiple factors. In addition to recent breakthroughs in AI algorithms, the high-performance computing (HPC) solutions needed to power AI workloads are more accessible and affordable than ever. Meanwhile, there's more data available to fuel AI and drive actionable responses in real time.

This eBook will look at how to get more value from AI initiatives, so your company has smarter insights to drive operational efficiencies, transform decision making, and accelerate business growth. We'll explore the meaning of AI, its impact on your business processes, IT infrastructure, and enterprise security, as well as how to choose the technology foundation to power it all.



#### ARTIFICIAL INTELLIGENCE

A program that can sense, reason, act, and adapt.



#### MACHINE LEARNING

Algorithms whose performance improve as they are exposed to more data over time.



#### DEEP LEARNING

A subset of machine learning in which multi-layered neural networks learn from vast amounts of data.

## The Evolution of AI, Machine Learning, and Deep Learning

Founded as a research field in the mid-1950s, AI is an umbrella term for using machine intelligence to mimic—and surpass—what humans can do. The practices of machine learning and deep learning are what make AI possible.

Machine learning refers to the process of “training” a machine to perform a specific task. Rather than a team of programmers writing the specific instructions for accomplishing a task, the machine uses algorithms to parse large amounts of data, analyze it, and “learn” from it. Deep learning is a machine learning technique that uses neural networks as the underlying architecture for training models.

The training algorithms used for deep learning are compute-intensive, so HPC infrastructure is essential for accelerating AI workloads. Fast compute power and storage, along with massive memory capacity and high-bandwidth connectivity, are all key elements for efficient processing—speeding the time to deeper, actionable insights.

Now, thanks to technology leaps, the affordability of HPC solutions, and an explosion of data, AI is moving from its academic roots to the forefront of business and industry. Companies can use AI to gain greater insights and garner value from the data they capture and store, but a key challenge is how to scale a few AI pilot projects into enterprise-wide initiatives. That’s where AI-driven business processes and AI-optimized infrastructure come in.

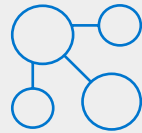
84%

**84% of C-suite executives believe they must leverage AI to achieve their growth objectives.<sup>2</sup>**

76%

**76% say they struggle with how to scale AI across the business.<sup>2</sup>**





**AI will start to get involved in failure recognition, predictive analytics, and other functions. It will enable IT to do more and at faster rates, growing infrastructure without necessarily growing staff. The critical timeframe for this trend is between 2021 and 2023.<sup>3</sup>**

## Transforming Business with AI Initiatives

Across a wide range of industries, companies are embracing the power of AI applications and HPC systems to make their businesses smarter, more responsive, and more secure. AI-driven systems help you uncover new data insights for solving business problems and exploiting market opportunities. But to be effective, your business decision models need to be people-centric (that is, client-centric) and backed by infrastructure designed for the most resource-intensive workloads.

Examples of how AI-driven business processes enable people-centric decision making:

- **Customer engagement:** By analyzing customer behavior and transaction history, you can tailor products and services to better meet different customers' needs.
- **Fraud prevention:** With real-time analysis of online transactions, you can identify suspicious activity and prevent potential fraud—without disrupting legitimate business.
- **Preventive maintenance:** To improve employee productivity, you can track equipment usage and service history to know when preventive maintenance is needed.

However, many companies struggle with how to turn their siloed, “proof of concept” AI projects into company-wide implementations. To successfully scale AI initiatives, your business needs a holistic data and analytics strategy. Business processes need to evolve, based on a clear enterprise vision, structure, and governance. And once you’ve instilled the right AI capabilities and mindset in the organization, you’ll need to ensure your infrastructure is ready to deliver your data-driven insights—with unprecedented speed and scalability.



# 3.5x

**Using modernized IT to support AI, companies are 3.5x more likely to uncover new market opportunities via analytics, and reduce the cost of business operations by nearly triple the rate of those with aging IT.<sup>5</sup>**

# 67%

**Process up to 67% more data per second with Dell EMC PowerEdge R7525 powered by AMD EPYC™ Processors.<sup>6</sup>**

## Optimizing Infrastructure for Greater AI Value

To get the most value from your AI initiatives, you'll need to optimize the underlying infrastructure to improve day-to-day operations and enable innovation. Modernized servers include the latest automation technology, which can free up time and resources within I&O (infrastructure and operations) for AI and machine learning pursuits, while also delivering faster, deeper insights across the organization.

In fact, when you upgrade to modern servers with automation capabilities, you can expect:<sup>4</sup>

- 43% faster deployments
- 38% faster updates of applications
- 43% higher systems reliability
- 37% less time spent on routine, manual IT infrastructure management

AI-optimized servers should have high-performance processors for robust data-crunching, advanced graphics cards for workload acceleration, substantial storage for working with massive data sets, and extensive memory for supporting multiple parallel operations. The good news is that these AI-optimized platforms are available now, using off-the-shelf technology, to deliver industry-leading performance per dollar—so you can make strategic investments in IT to drive better business outcomes.

In addition, a trusted technology partner can simplify your AI journey, from strategy to implementation to ongoing optimization. Experts can help ensure that each hardware and software component is configured correctly and integrated seamlessly into the environment. The result is a faster time to value, with measurable returns aligned with your enterprise vision.



## Keeping Your AI Workloads Safe and Secure

In today's business world, cybercriminals are lurking everywhere—looking for new ways to gain unauthorized access to sensitive data. Some savvy criminals even use AI in their exploits, so your company has to use AI to fight AI, or risk leaving your critical assets exposed. Security has to be prioritized at every layer of your IT infrastructure, especially as AI, the Internet of Things (IoT), and other evolving technologies introduce new vulnerabilities. Data privacy, digital ethics, and security best practices are vital for maintaining trust and ensuring business success.

To protect against emerging threats, your infrastructure should be AI-ready with end-to-end security. At the platform level, your systems should include built-in security with:

- ♦ **A secure hardware root-of-trust.** If the server BIOS is corrupted or compromised, the processor should prevent the firmware from booting.
- ♦ **Hardware-accelerated memory encryption.** The processor should protect data-in-use with full-stack encryption, using secure key generation and key management.
- ♦ **Virtual machine (VM)-level encryption.** The processor should also protect against hypervisor corruption with hardware protection, which is a more robust solution than software protection.
- ♦ **Server-level security technology.** Beyond secure processors, the server platform should offer digitally signed firmware updates, automatic BIOS recovery, firmware rollbacks, and systems lockdowns to prevent configuration “drift.”

Trusted vendors also build security into their manufacturing processes and ensure a secure supply chain. This includes verifying the authenticity of components or parts, using trusted suppliers, and physically securing the build environment, the system build process, and the final shipments to customers.



Through 2022, over 75% of data governance initiatives will not adequately consider AI's potential security risks and their implications, resulting in quantifiable financial loss.<sup>7</sup>



**World Records set new standards  
for in-memory Big Data  
benchmark @1 TB and @3 TB**

Dell PowerEdge R7515 servers with AMD EPYC 7542 processors set a new standard for performance and price-performance with a world record TPCx-HS V2 benchmark result at both the 1 TB scale factor<sup>8</sup> and the 3 TB scale factor.<sup>9</sup>

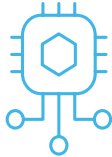
## Simplify Your AI Journey with Dell Technologies and AMD

With the power of AI and machine learning, your company can drive innovations and improve operations. And with trusted technology partners like Dell Technologies and AMD on your side, your AI journey can be worry-free. With an unrivaled portfolio of modern infrastructure and AI-optimized solutions, backed by dedicated AI experts, Dell EMC can help you capitalize on the latest technologies—saving you time and money, while reducing risk.

Dell EMC PowerEdge™ servers, powered by AMD EPYC™ Processors, are engineered with the right balance of performance and low TCO for AI workloads. Built for processing massive amounts of data, the platform features the highest-performance architecture, generous memory and storage options, and industry-leading security.

What's more, Dell Technologies' worldwide HPC and AI Centers of Excellence make it easier to collaborate with some of the brightest minds in AI, HPC, and data analytics. The expert network of resources can help you fine-tune your solutions, test new technologies, and share best practices for optimized results.





### Faster Machine Learning; process images in 55.8% less time

Finish machine learning preparation tasks on Kubernetes containers in less time with the Dell EMC PowerEdge R7525.<sup>10</sup>

## Turn AI Possibilities into Reality

An end-to-end portfolio of AI-optimized technologies is just the start. With a team of AI experts that can bridge the gap between IT, data scientists, and the lines of business, Dell Technologies makes it easier to advance your AI initiatives—delivering faster insights for lasting value. Why wait to take the guesswork out of your AI journey?

LEARN MORE ABOUT POWEREDGE  
SERVERS POWERED BY AMD

DELL TECHNOLOGIES HPC AND  
AI CENTERS OF EXCELLENCE



The AMD EPYC SoC's no-compromise single-socket solution helps you optimize the compute power for your application. Incredibly high core counts, memory capacity and bandwidth, and massive I/O help enable breakthrough performance and lower cost of ownership for many applications including big data analytics.



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<sup>1</sup> Gartner, "Gartner Says Global Artificial Intelligence Business Value to Reach \$1.2 Trillion in 2018," April 25, 2018.  
<https://www.gartner.com/en/newsroom/press-releases/2018-04-25-gartner-says-global-artificial-intelligence-business-value-to-reach-1-point-2-trillion-in-2018>

<sup>2</sup> Accenture, "AI: Built to Scale," November 2019.  
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<sup>3</sup> Gartner, "Gartner Top 10 Trends Impacting Infrastructure & Operations for 2020," December 10, 2019. Gartner Top 10 Trends Impacting Infrastructure & Operations for 2020

<sup>4</sup> Forrester Research commissioned by Dell EMC, "Insights From Modernized IT: How To Achieve The Greatest Success As You Automate," November 2018.  
<https://www.dell EMC.com/resources/en-us/asset/analyst-reports/products/storage/forrester-delivering-outcomes-by-automating-compute-infrastructure.pdf>

<sup>5</sup> Based on ESG Research Insight Paper commissioned by Dell EMC, "Measuring the Value of Data and Analytics Inside Modernized IT Departments," August 2019.  
<https://m.softchoice.com/web/newsite/documents/partners/dell/servers/esg-research-insight-measuring-value-of-data-analytics-in-modern-it-departments.pdf>

<sup>6</sup> Based on Principled Technologies Spark report commissioned by Dell Technologies, April 2020.  
Principled Technologies <https://www.principledtechnologies.com/Dell/R7525-EPYC-7502-Spark-report-0420.pdf>

<sup>7</sup> Gartner, "Top 10 Strategic Technology Trends for 2020," October 21, 2019.  
<https://www.gartner.com/doc/reprints?id=1-YAFQIDG&ct=200206&st=sb>

<sup>8</sup> TPCx-HS benchmark results at 1 TB scale factor for the Apache Spark framework are: 11.73 HSph, 38,182.70 \$/HSph, 10/15/2019 system availability. Full disclosure report available on the TPC website at: <http://www.tpc.org/5535>

<sup>9</sup> Single-socket AMD EPYC TPCx-HS benchmark results at 3 TB scale factor for the MapReduce framework for the AMD EPYC 7542 processor: 11.62 HSph, 38,544.15 \$/HSph, 10/15/2019 system availability. Full disclosure report available on the TPC website at: <http://www.tpc.org/5536>

<sup>10</sup> Based on Principled Technologies Kubernetes report commissioned by Dell Technologies, April 2020  
<https://www.principledtechnologies.com/Dell/R7525-EPYC-7502-Kubernetes-report-0420.pdf>