The inside story: How high-speed insights make for rapid R&D

Bringing together your data and putting AI to good use – that's how you ramp up drug discovery and development at Roche.

NetApp

Draw greater intel out of your clinical data

Artificial intelligence (AI) is taking the life sciences industry by storm, giving businesses the ability to utilize their data in ways that could transform the sector.

For instance:

- Making discoveries based on big biological data using machine learning (ML)
- Integrating clinical records and genomic data of different kinds
- Uncovering new medicine or drug targets
- Identifying new classes of cell types
- Reducing R&D costs
- Selecting the right patients to improve efficacy of clinical trials

It's no secret that data fuels the operations of information systems. Guaranteeing data integrity means ensuring your systems' functionality and efficiency. This is especially important for life sciences companies like Roche, where the availability of quality data can dictate the success of drug discovery and clinical trials.

Gathering high-quality and statistically-sound data is the aim of every clinical trial, and effective data management is essential to ensuring accurate data collection, entry, reporting, validation, and analysis.

If an organization is using "dirty data" – we're talking the incomplete, inaccurate, and non-standardized kind – it can lead to costly mistakes that hamper daily operations and waste staff time and resources. This puts your organization, and the success of your clinical trials, in jeopardy. Why? Because it has the potential to inhibit R&D by providing misleading information that results in incorrect discoveries. This can prove hugely damaging to a pharma company's reputation and may lead to crippling lawsuits or a significant delay in the development of a drug or medicine.

To tackle this, organizations like Roche need to be more proactive in using data transformed by advanced analytics. We know it takes optimized staff, automated throughput, and centralized operations to get the most from your clinical data.

So, what do we prescribe? An AI-powered infrastructure that lets your teams share and access data faster between on-prem and the cloud, dramatically reducing the time it takes to get from data to insights, actions, and outcomes.

Setting off on an AI journey

Over 60% of life sciences companies spent more than $20 million on AI initiatives in 2019 and over half expected AI investments to increase last year too.[1]

[1, 2 & 3]Source

At Roche, you're aiming to make AI mainstream throughout your organization. By implementing a single data source and utilizing AI, you plan to enhance R&D of new life-changing drugs, extract greater insights from your clinical trial data, and streamline and automate the manufacturing process.

But, merging all this data isn't without its challenges. When implementing AI, medical information is presented in unstructured files with lots of ambiguity. Finding the right resources for widespread data collection and combining data sources remains difficult.

The other thing to consider, is that to truly benefit from AI, a connection must be made between real-time data gathered from patients taking part in clinical trials and a centralized location where their datasets are stored. Numerous factors must come together in order for this goal to become a reality.

What are fellow life sciences companies hoping to achieve with AI?

28% want to enhance existing products

27% want to create new products and services

22% want to make processes more efficient

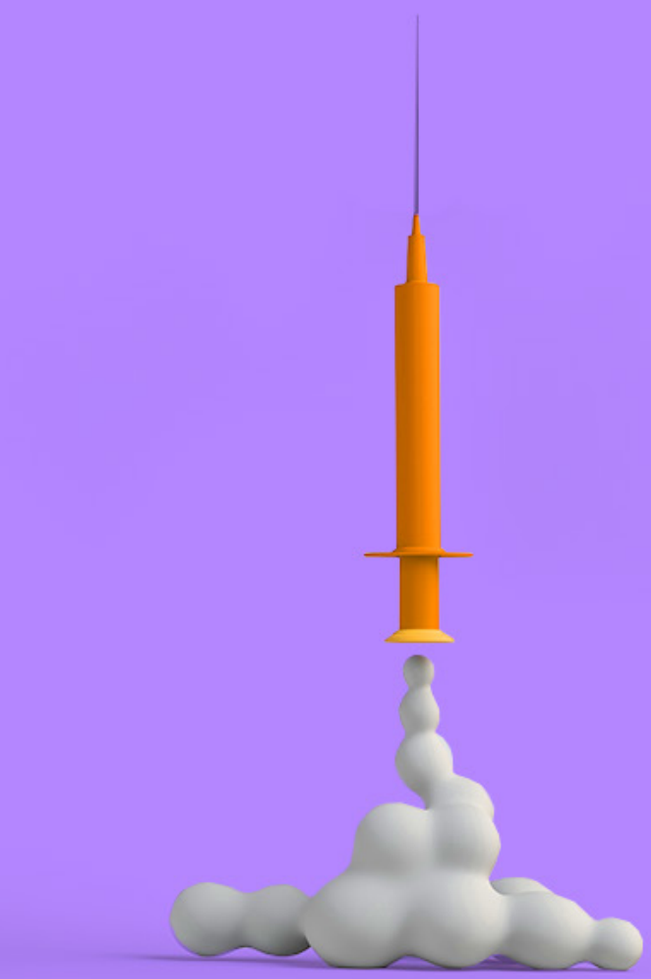
In fact, 43% report already having used AI to successfully increase process efficiency.[2]

The top three challenges impacting life sciences businesses' AI initiatives:

30% struggle to find the highest-value business case

28% face data challenges

28% find it hard to integrate AI into their organization[3]



Giving Roche an AI injection

Cloud storage is our specialty. We tailor our solutions to Roche's needs. We do this by building you a unique, resilient, scalable data fabric. This architecture of systems, software, and services links your data from edge to core to cloud, managing it as a single, connected experience that eases information exchange throughout your entire organization.

Our ONTAP AI solution is powered by Nvidia and breaks down silos to generate deeper insights. This lets you extract further intelligence from your structured and unstructured data, speed up analysis from disparate sources, and leverage AI and ML to better identify, risk-stratify, and aid drug discovery and clinical research.

Winning decision-making

We work with you to build your AI-powered infrastructure designed for easier information access, cutting time from data to insights, actions, and outcomes. This secure movement and sharing of data across on-prem and cloud environments means you can make better decisions faster.

You can also scale AI environments to process data in record time, create data pipelines with our ecosystem of partners, and use embedded technology and algorithms and federated learning platforms with NetApp and Nvidia.

Premium performance

Our solutions automatically optimize your infrastructure availability, performance, and costs. This flexibility lets you monitor, assess, and predict application resource needs, so you're never caught short.

With this information to hand you can scale-out – or scale-up – and grow at the speed your business demands. You can even scale bandwidth and performance effortlessly to support data-intensive clinical trials.

One of the cloud's most valuable features is its ability to scale. You should never pay for more than you need. NetApp equips you to simplify and automate cloud infrastructure to deliver exactly what your applications require at the lowest cost. So, you can do more with less – time and money. Set it, forget it, and reap the benefits of greater efficiency and optimal performance.

> **At NetApp, we provide access to accurate data so that you can act and adapt with speed and confidence.**

Deep learning is revolutionizing modern surgery at NISI

A bit of background

Non-Invasive Surgical Innovations (NISI) specializes in medical and surgical innovations. In 2018, it began work on a ground-breaking R&D project to develop a deep learning solution that would improve the functionality of its medical devices by using machine learning to identify disease features in medical imaging.

How it works

NISI collects medical images from clinics and hospitals, which are grouped and labeled by expert clinicians and surgeons. This data is then uploaded and used to train its deep learning algorithms. As time passes and the dataset increases, these deep learning algorithms become more precise. They're then installed on medical devices to perform diagnosis or improve the accuracy of clinicians' decision-making.

The problem

As the project progressed, NISI experienced exponential dataset growth. While this was essential for optimizing the performance and accuracy of its deep learning algorithms, this also led to new pressures on the organization's storage and processing capabilities. What's more, the data used was unstructured, meaning NISI required more power-intensive resources to process the datasets at lightning speed.

In short, NISI needed more storage and increased data throughput to enable the deep learning process at the core of its Software as a Device (SaMD) model. Its previous storage network throughput speeds clocked around one gigabit per second, slowing its capabilities and creating a bottleneck.

The solution

To grow its data storage capabilities for the continued development of its deep learning solution, NISI chose our ONTAP AI solution. This was an important upgrade that allowed it to carry out its process-heavy deep learning and AI workloads.

ONTAP AI is a reference architecture that provides compute, storage and networking capabilities, and is able to deliver sustained high input/output (I/O) throughput at top speeds for faster training times.

The infrastructure incorporates our all-flash storage, which is supported by predictive AI-based analytics that increase performance and IT agility and reduce latencies across its deep learning system.

With NetApp's ONTAP AI solution in place, NISI was able to:

- Increase its storage capabilities over 40Gb/s storage bandwidth for deep learning training – over 40 times faster than previous speeds.
- Maintain over 2GBps of sustained throughput (5GBps peak) with less than 1ms of latency while the GPUs operate at over 95% utilization.
- Gain access to a far faster image training time, lowering its overall compute costs and accelerating AI innovation and productivity.
- Future-proof its operations with an agile infrastructure that can be easily scaled up as the business develops.

> NetApp has provided us with top-end, cost-effective solutions. The seamless migration has meant that we have been able to remain focused on furthering our deep learning capabilities, helping NISI move closer to our goals of improving diagnostics and medical technology through data.

Dr. Hoi-Pang Ng, General Manager at NISI

Is Roche looking to achieve more with AI?

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