Big Rewards Await Pharma Companies with Big Data in the Cloud

Pharmaceutical companies aiming to leverage artificial intelligence and big data analytics without exorbitant spending should look to the cloud for their infrastructure needs.

The plummeting costs and rising availability of genetic testing, coupled with the ubiquity of digital clinical data, are creating promising new opportunities for pharmaceutical and life sciences companies to develop innovative drugs and breakthrough precision therapies.

The amount of genomic data available for research doubles in size every eight months, says Eric Banks, Senior Director of the Data Sciences and Data Engineering (DSDE) group at the Broad Institute, a collaboration between Harvard and MIT.

"It's a level of growth that for years has far exceeded Moore's law," he observed. "That's a good thing because the world is full of really hard, medically relevant scientific problems that we can solve only with petabytes of data."

Since 2009, the Broad Institute has generated more than 70 petabytes of genomic data from 100,000 genomes – a dataset equal to 1.2 billion hours of streaming music files.

Those numbers don't include the electronic health record (EHR) data that can offer pharma stakeholders crucial clinical insights, or data from wearable devices, home monitors, and other patient-generated sources that support research into the efficacy and side effects of new therapies.

Storing this vast collection of data can be a challenge for enterprises that do not plan for the ongoing big data deluge.

Data assets must be seamlessly accessible for analytics teams, researchers, and business development units, especially in the era of artificial intelligence. Also, organizations must anticipate exponential growth in the amount of data they will need to manage.

Privacy and security are also critical factors due to emerging issues of patient consent, the reuse of data for research purposes, and the fundamentally identifiable nature of DNA data.

The pressing need for secure, flexible, scalable solutions in an unpredictable environment will naturally lead pharmaceutical organizations to reassess their current data storage strategies.

For many organizations, they may find that their existing on-premise data storage infrastructure is just not suitable for the sophisticated big data analytics required to compete in the modern precision health environment.

On-premise tools require significant up-front capital investment, and enterprises must anticipate their maximum level of use when purchasing servers at the beginning of an initiative.

Scaling up their storage, even by a little, means buying additional new hardware, a prohibitively expensive prospect for many organizations.

Scalability and agility are among the most prominent benefits of the cloud, contributing to the rapidly increasing popularity of cloud-based strategies.

While on premise solutions require significant upfront investment in time and resources to implement, cloud offers the ability to quickly and inexpensively spin up – or down – their computer power.

With the cloud, organizations do not have to pay for more resources than needed, but retain the ability to bulk up their infrastructure whenever additional power is required.

Organizations with on premise solutions must also manage their infrastructure – and its security – by themselves, bringing additional high costs for staffing, physical environment maintenance, and other tasks.

Entities with on-premise architecture are generally left to their own devices to buy or develop any advanced analytics tools or services they desire, such as the AI and machine learning algorithms that are becoming increasingly important for generating actionable insights.

As a result, healthcare enterprises facing the high costs, limited growth potential, development issues, and management challenges of on-premise architecture are turning to the cloud in droves.

Cloud computing and cloud storage tools offer relief from many of the pain points produced by on-premise infrastructure, says the Cloud Standards Customer Council (CSCC) in a recent white paper examining the impact of cloud adoption in healthcare.

"Arguably, the greatest functional benefit of healthcare cloud services is the wide range of new capabilities that they are able to offer," says the report. "Sophisticated analytic capabilities can be brought to bear to improve both patient-specific and population-based assessment and management."

Cloud-based infrastructure also sets organizations up for success with AI and machine learning.

When working with large data sets, such as those involved in artificial intelligence and machine learning models, the ability to quickly scale in the cloud is critical.

Cloud service providers have readily recognized their important role in supporting AI and machine learning, and many are offering ready-to-use tools and technologies that can help organizations speed through the AI maturity curve.

Amazon Web Services (AWS), for example, recently released its cloud-based Comprehend Medical offering which promises the capability to comb through unstructured health data and extract actionable insights with the help of advanced natural language processing methodologies.

Organizations are rapidly recognizing that the benefits of the cloud can improve their operations while simultaneously reducing spending.

In 2017, sixty-five percent of hospitals and health systems were using cloud-based storage and computing technologies, according to a survey by HIMSS Analytics.

Three-quarters of participants stated that cloud is well-suited to act as a primary data storage hub, while more than 84 percent believe cloud can provide critical disaster recovery and backup services.

A separate survey by HIMSS Analytics also found that cost savings are the strongest motivator for healthcare organizations to adopt cloud. Organizations are also turning to cloud as a way to take advantage of easily scalable data storage features and speed up the deployment process.

"Between the digitalization of the enterprise and the prevalence of SaaS offerings that support the healthcare industry, many of the barriers to [cloud storage] entry have disappeared," the CSCC states. "In addition to this reduced barrier to entry, greater value and improved cloud service agreements are now available."

"In fact, most cloud service providers are able to deliver significantly higher levels of service for application availability and disaster recovery for substantially lower costs than with on premises or co-located data centers. These benefits extend beyond cost and service level drivers to improved responsiveness with internal business partners and decreased administrative overhead."

For pharmaceutical and life science enterprises on the cutting edge of innovation, flexibility and the ability to be nimble in the face of ongoing change are non-negotiable requirements for success.

The 'explosion of data' from next generation [genomic] sequencing, as well as the growing importance of biologics in the research process, is making cloud computing an increasingly important aspect of R&D," observed the Cloud Standards Customer Council.

"Pharma firms no longer are required to implement the capacity to handle large datasets in their computing facilities, lowering the barrier to entry and increasing the velocity of change."

As the volume of available big data continues to skyrocket and analytics capabilities become increasingly critical for research and business intelligence purposes, pharmaceutical companies should strongly consider cloud-based storage and computing technologies to support the next iteration of precision health.

With significant advantages in flexibility, scalability, security, and lower costs, the cloud offers the pharmaceutical industry an extraordinary opportunity to advance the delivery of quality patient care by supporting breakthrough research into effective therapeutics and personalized medicine.

About ClearDATA

Healthcare professionals across the globe trust the ClearDATA HITRUST 9.1 -certified cloud to safeguard their sensitive data and power their critical applications available across the major public cloud platforms. For healthcare organizations, customers receive one of the most comprehensive Business Associate Agreements (BAA) in the industry, combined with market-leading healthcare-exclusive security and compliance solutions. ClearDATA's innovative solutions protect customers from data privacy risks, improve their data management, and scale their healthcare IT infrastructure, enabling the industry to focus on making healthcare better by improving healthcare delivery.