

Industry Report

Cloud Computing and the Digital Lab

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Digital data has significant value and huge potential to influence decision-making and experimentation, but only if it is accessible on demand. With cloud technologies, scientists can store all their data in one place, find it, and derive actionable insights across a global operation. However, when considering the cloud for the digital lab, it's important to understand the advantages of cloud-based data, how GxP is incorporated, and why partnerships are the force multiplier the industry has been waiting for.

The advantages of data engineered and available in the cloud

Cloud-based technologies offer scalable data processing, analysis, and storage to support the dramatically increasing volume of data and accessibility required to reach overall R&D goals. For example, scientists can innovate efficiently by applying insights from historical findings to their current projects when they can access all of their data in one, well-architected cloud platform designed for scientific data. This notion of evergreen data is in stark contrast to scientific data that was collected on a desktop PC and never left that same desktop after the initial processing.

Cloud computing with the addition of well-engineered data opens the door to the powerful combination of science and data science - all that 'dead data' suddenly has multiple new lives that can drive science to new levels. Data science has the possibility to revolutionise drug development and manufacturing, so much so that many biopharmaceutical companies now have data scientists on every project team.

So what makes a well-designed cloud platform?

- **Built for scientific data:** The platform should resolve the problem created by multiple proprietary data formats by engineering scientific data so that it can be searched, shared, and interrogated, regardless of the use case.

- **Enables a network ecosystem:** The free data flow between applications creates a new wave of innovation that spans vendor boundaries. For example, data engineering companies focus on transforming and cleaning data, while scientific application companies focus on deriving scientific insight from the liberated data.

It's safe to say that technology has enabled cloud platforms to transform almost every industry. With the sheer amount of data produced in life sciences, the right platform can help customers easily adopt new tools, create new workflows, and share data between scientists and data scientists.

Leveraging a cloud platform in regulated environments

With widespread cloud platform adoption across industries, functional areas like security are well understood. However, it is only recently that cloud platforms have been developed for use in 'GxP' regulated environments. Such usage requires that specific design principles be incorporated into the cloud platform to enable biopharmaceutical organisations to create and manufacture efficacious and safe products.

Most importantly the cloud vendors whose products will be used in GxP environments must demonstrate a deep understanding of how their product will be used. This 'intended use' requires that vendors invest in domain experts who understand the scientific and operational outcomes required by customers in order to build a product that has little to no risk of data integrity incidents.

Secondly, the cloud platform must allow customers to continuously see where there might be risks - dashboards need to show security events, audit trail events, and the overall health of the platform at any time.

Thirdly, the cloud platform has to provide the capability for customers to validate the system in their environment as seamlessly as possible. Significant advances have to be made to allow this validation to happen quickly and effectively as some cloud platforms are updated every few weeks.

The combination of all three of these attributes is essential before entrusting GxP processes to the cloud. Organisations considering moving GxP to the cloud should thoroughly evaluate their cloud provider's product features and commitment to quality controls and processes.

The need for vendor-neutral open partnerships

No organisation providing tools to the life sciences industry, irrespective of how big, can fully realise innovation potential entirely by itself. That's where partnerships come in. Specifically, vendor-neutral, open partnerships which prioritise customer needs and bring value to everyone involved - both customers and partners.

These partnerships may involve groups within a large organisation, between companies, or with experts or the public, but in the end, the people involved in the project are vital. Subject matter experts who can specify their technology and workflow requirements provide a starting point for partners to work jointly in assembling a solution that addresses the features, functions, and capabilities end users need.

The cloud can accelerate scientific insights and outcomes by helping scientists work with data more efficiently and securely. Paired with the right partnership, organisations can continue to leverage the cloud and collaborate in today's digital lab. Together, our industry is poised for a data revolution and it's time we all participated - in the end to create better therapies, faster.



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