Navigating Scientific Software for Biopharma Success

Scientific software is being purpose-built and adopted across all aspects of biopharma workflows. Biotech and pharmaceutical organisations of all sizes and modalities, including small molecules, biologics and cell and gene therapies, are rapidly embracing these digital solutions to transform research and development and accelerate therapeutic discovery. While hardware innovations such as liquid-handling workstations, robotic sample movers, shakers and incubators might come to mind, equally critical is the role of software. For example, software helps manage growing sample numbers and data complexity from high-throughput workflows that process thousands of new samples in a single week. These laboratory modernisation efforts have driven major gains in efficiency and throughput, as reported in a recent survey of R&D executives who said 53% have already experienced increased laboratory throughput as a direct result of digital transformation initiatives. This is expected to rise to 85% by the end of 2028.[1]

Software not only orchestrates laboratory systems, but it is also crucial for managing data workflows. Automated and systematic data capture, parsing and analysis enable faster experimental testing, cross functional collaboration and regulatory ready reports. Well-governed datasets are also foundational for applying AI and advanced analytics in drug discovery. The drug discovery technologies market has grown to $30.58 billion and continues to expand.[2] While this growth is accelerating therapeutic discovery, it also creates a complex landscape of software hosting and licensing models. So, choosing how to implement software and store data to deliver the most strategic value to your organisation is a challenge.

Solutions that Meet You Where You Are: SaaS vs On-Prem

With mounting budgetary and time constraints to develop drugs faster, organisations must select a solution that is fit-for-purpose and aligns with their scientific goals, operational maturity and available resources. With a software need identified, the first most important decision is choosing the right hosting model.

- Software as a Service (SaaS): SaaS is a cloud-based delivery model in which a third-party vendor hosts and maintains the application, such as a data analysis or workflow platform, and users access it via the internet.

- On-Premises (On-Prem): On-prem software is installed and operated on an organisation's own servers and infrastructure. The organisation is responsible for system maintenance, upgrades, security and compliance.

Start-ups, small, medium and large biopharma organisations operate with different levels of in-house expertise and therefore have distinct organisational needs. Budget differences can further widen the gap. In the current biopharma landscape, start-ups and small biotechnology companies have experienced a nearly 40% decrease in venture capital funding since May 2021.[3] At the same time, R&D partnership deals have increasingly shifted toward later-stage clinical assets, leaving early discovery and preclinical research with less access to funding.[4] As a result, for start-ups and organisations that lack extensive internal IT capabilities and don't have the resources for large capital expenditures, SaaS solutions are a strong and supportive partner for research efforts.

The benefits of SaaS include rapid deployment. With an internet connection, users can access the software almost immediately to begin accelerating their R&D workflows. A strong SaaS partner should also provide validated workspaces that are both secure and globally accessible, while assuming responsibility for system maintenance, automatic updates, compliance features and broader IT management. When evaluating SaaS options, it is important to consider whether the platform can scale as the organisation grows. Consider whether the software simply collects all the information in one place or whether it has a built-in data model to support institutional learning and application of AI tools over time.

On premise solutions also have their advantages. While they require greater upfront investment and significant internal IT know-how to implement and maintain, on prem deployments allow for deeper platform customisation and full control over security and compliance in the hands of the host. For some organisations, complete control over the data makes it a preferred option. However, it is worth asking whether your biotech realistically has the resources and personnel to support and operate this type of infrastructure long term.

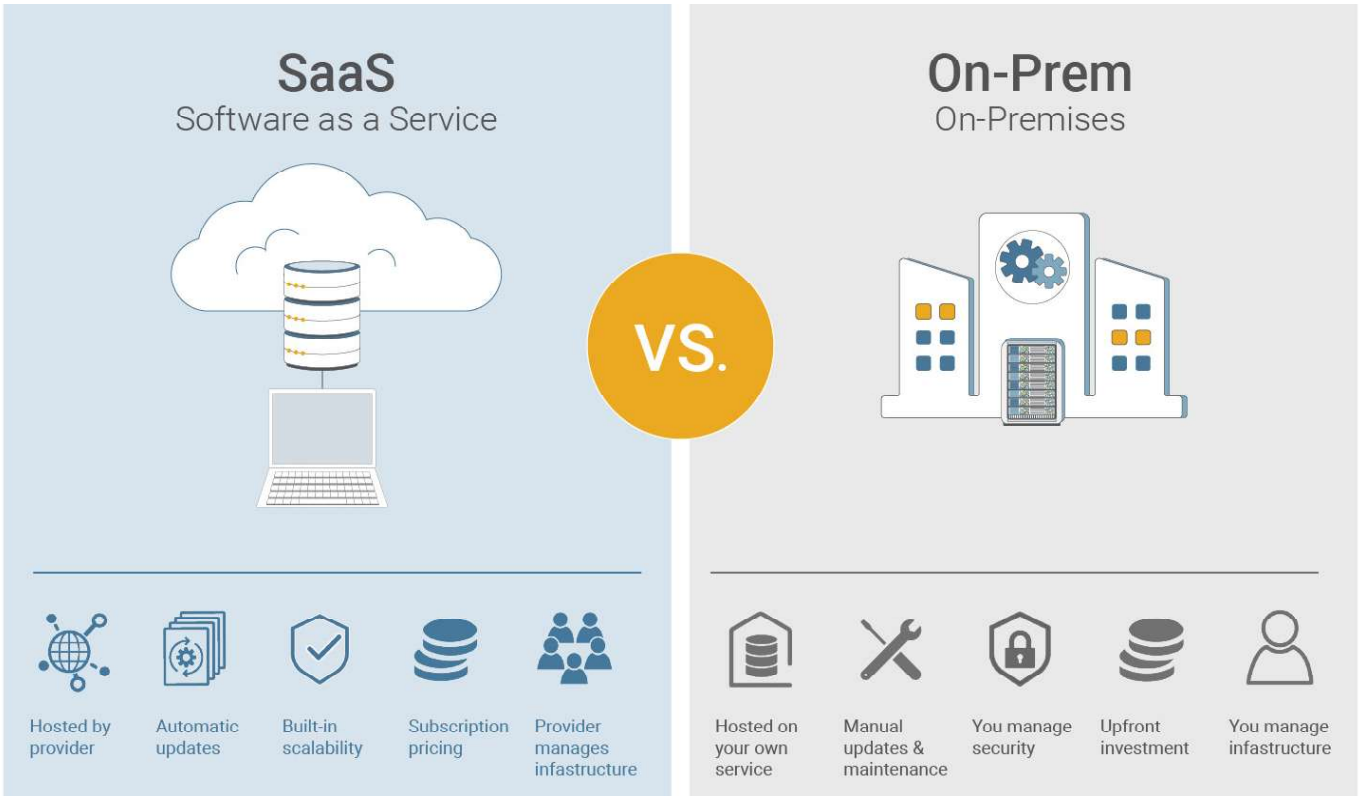
Ultimately, when choosing software and hosting, make sure it is future-proof. Will it scale? Can it mature alongside your biotech? The right digital solution, be it SaaS or not, should grow with you rather than work against you.

Considering On-Prem

For biopharma organisations with specialised scientific workflows, for example requiring large data volumes to be transferred without compression, on-prem software deployment can be a practical choice. On-prem solutions also provide full ownership and control over sensitive data, which may be important for some organisations. While the need for significant internal IT expertise and upfront investment is higher, it can be a fit for organisations with unique requirements and a commitment to maintaining direct oversight. At the same time, broader industry adoption continues to shift toward cloud based deployment models.

So, You've Picked SaaS. What Else Needs to Be Considered?

Deciding that a biopharma cloud solution is right for you, whether for flexibility, rapid deployment, IT capabilities or



reasons, is the first of many key decisions in choosing SaaS. The next aspect to consider for your organisation is that biotech and pharmaceutical R&D operate within a highly dynamic landscape. In addition to the shifting financial environment, these organisations face ongoing challenges related to managing laboratory space, scientific expertise, laboratory equipment and automation, and partnerships with contract research organisations (CROs), among others.[5] Team structures are also increasingly fluid, with both researchers and leadership experiencing regular turnover.

Given this complexity and the fact that not all SaaS providers are created equal, maximising the value of SaaS solutions for R&D teams requires careful consideration of licensing models:

- User Licensing
- Usage Licensing
- Tiered Feature Licensing

Is this Seat Open?

User licensing is one of the most common SaaS pricing models. Organisations assign seats to individual users, charge per seat and typically reconcile license counts annually. In SaaS environments supporting biopharma R&D, however, this model often breaks down. Knowing that R&D teams have frequent changes in personnel, projects and CROs leads to license churn, unused seats or the need to over provision access to avoid workflow disruptions. This can result in unnecessary costs and administrative complexity.

What may really benefit biotechs is SaaS platforms with controlled identity-based access. Rather than tying access to static paid seats, identity based models allow SaaS solutions to grant permissions based on authenticated identities, roles and project needs. This way, internal scientists, external collaborators and short term contributors can securely access the platform without constant license renegotiation. Additionally, this provides governed access in real time according to project requirements, preserving the flexibility and scalability that SaaS promises.

No More Surprising Bills

You would think that organisations pay only for what they consume, compute hours, storage, API calls or analyses run. In theory, usage-based licensing offers flexibility and efficiency, especially for cloud native platforms. In practice, however, biotech R&D workflows often involve intense, episodic computational demand. High throughput screening, imaging or multi omics workflows can trigger sudden spikes in compute usage, resulting in unpredictable and sometimes significant cost increases. These cost surges can be difficult to predict and thus challenging to resolve with management and fixed budgets.

Instead, what can benefit biotechs more is a SaaS pricing model that balances usage based elasticity with cost predictability. Platforms that combine a baseline or committed pricing level with the ability to absorb heavy compute loads during short analysis bursts allow teams to complete critical work without constantly worrying about runaway costs. This approach is particularly valuable for organisations with fluctuating batch workloads, such as high throughput screening or biological characterisation groups. By smoothing costs while still enabling on demand scalability, these SaaS models support scientific productivity and operational planning.

Bronze, Silver or Gold? Get What You Need

Platforms are packaged into tiers, with key features for scientific

workflows gated behind higher tiers and typically locked into year-long contracts. While this model may simplify purchasing decisions, it assumes that organisations progress through capabilities and needs on predictable timelines. But, knowing research, how often is this the case?

Biopharma pipelines do not advance in neat annual cycles from discovery to development, manufacturing or clinical testing. Scientific priorities shift as data emerges, programmes are paused or accelerated depending on developability testing and new modalities or technologies are introduced. What biotechs really need are modular SaaS platforms designed for enterprise scale deployment but flexible by design. Systems should allow organisations to scale incrementally and plug in new modules, workflows, biological modalities or integrations over time, without being constrained by an initial contract. This flexibility enables R&D teams to adapt their digital infrastructure as their science evolves, rather than forcing scientific progress to conform to licensing tiers.

Conclusion

There is no universal software or licensing model that works for every biopharma and biotech organisation, and some vendors offer all options (user, usage and tiered all combined). The right software solution must reflect how your science is conducted, how your teams collaborate and where your organisation sits on its digital transformation journey.

For some organisations, on-premises deployments can offer greater control over data, infrastructure and compliance. Alternatively, SaaS solutions can also transform dynamic R&D environments instantaneously. However, cloud solutions need to be carefully chosen; while their licensing models may appear simple, they can quickly become misaligned, leading to unnecessary costs and contractual constraints.

Ultimately, fit-for-purpose is more than selecting the right features or deployment model for right now. It requires choosing software and licensing structures that scale with your scientific ambition and adapt to changing teams, workflows and AI tools. Choosing a SaaS platform and licensing approach that reflects your true R&D needs can turn digital infrastructure into a competitive advantage rather than a constraint on innovation.

REFERENCES

1. https://www.deloitte.com/us/en/insights/industry/health-care/future-proofing-pharma-rnd-labs.html?id=us:2el:3dp:wsjspon:awa:WSJCIO:2025:WSJFY26, visited on 2 April 2026.
2. https://www.prnewswire.com/news-releases/drug-discovery-technologies-market-worth-51-51-billion-by-2031--marketsandmarkets-302662239.html, visited on April 2026
3. https://pitchbook.com/news/reports/q4-2025-biopharma-vc-trends, visited on 6 April 2026.
4. https://www.mckinsey.com/industries/life-sciences/our-insights/the-synthesis/pulse-check-key-trends-shaping-biopharma-dealmaking-in-2025, visited on 6 April 2026.
5. DeCorte, B. L. Evolving Outsourcing Landscape in Pharma R&D: Different Collaborative Models and Factors To Consider When Choosing a Contract Research Organization. J. Med. Chem. 63, 11362–11367 (2020).

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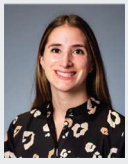

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