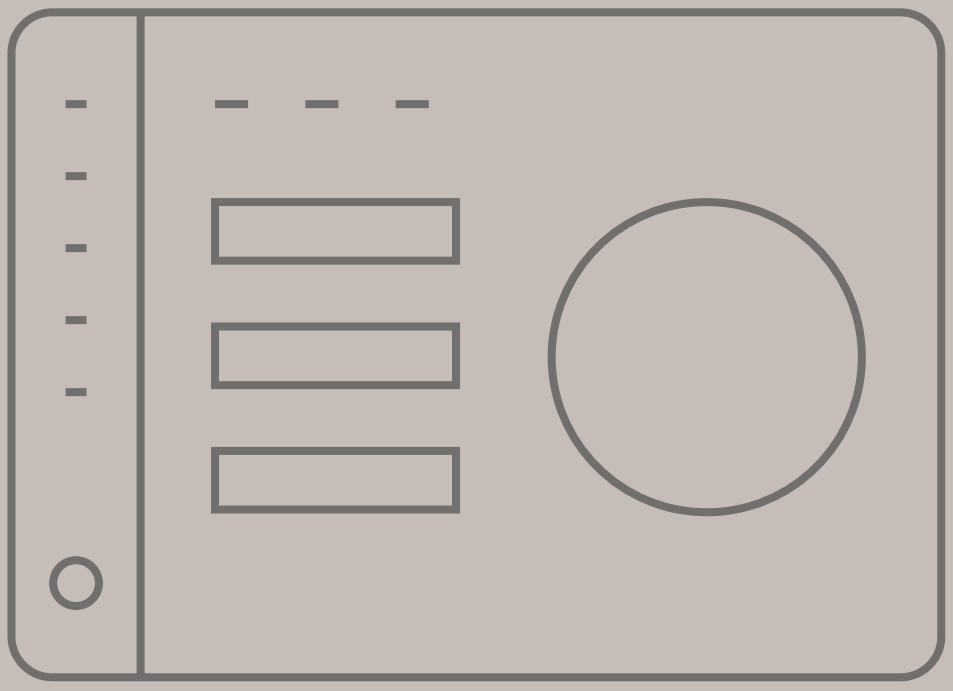
R&D Goes Full Digital

White Paper



Benchling

How Enterprise Biopharma Companies Are Embracing Digital Transformation

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Introduction

Biotech is having its moment. Thrust into the spotlight during the pandemic, global attention and unprecedented urgency launched biotech enterprises into a new era—one where digital transformation is a necessity. Forward-thinking companies are implementing digital solutions as part of a holistic and connected strategy to accelerate their breakthroughs and time to market. The right informatics solutions will be more than just tools. Both the solution and the team behind it are your partner and guide as you digitize your processes.

What you need to know

When you partner with Benchling, you'll experience and enjoy a world-class informatics platform as well as a team of experts to back it up and guide your path to digital transformation.

The Benchling R&D Cloud is an open and extensible platform that can easily integrate into your larger ecosystem, promoting enhanced data flow

It has a delightful, intuitive interface so scientists are actually excited to use it in the lab

It's designed to capture F.A.I.R. data, supporting scientists' work across teams by enabling seamless data-sharing

We employ the most advanced security and privacy measures for data protection

We also have extremely high customer satisfaction; 95% customer satisfaction score and 99% of customers continue with Benchling after their first year

We—like you—are focused on the future. We release products every three months to keep up with the ever evolving needs of modern R&D.

Our vision is a world where big data is used to create accurate and complete records of all research in real-time, resulting in more informed decisions based on better data. We've already helped over a thousand companies accelerate their R&D processes, increase their productivity, and streamline the way they collaborate. For biotech leaders of today, the choice is clear: adopt a digital transformation strategy with Benchling, or fall behind.

Why digital transformation in biopharma?

Digital transformation—in other words, the integration of digital technology into all areas of a business—has been talked about for over a decade. Now it's become fast-tracked.

It's happened so fast, in fact, that businesses can hardly keep up. The 2021 McKinsey Global Survey found that only 11 percent of leaders believe their current business models will be economically viable through 2023, while another 64 percent said their companies need to build new digital businesses to help them get there.

> **"Our survey confirms that the future will belong to companies that put technology at the center of their outlook, capabilities, and leadership mandate."**
>
> **McKinsey and Company**

To make this happen, many biotech entities are moving towards a holistic and connected enterprise digital strategy. Data that is siloed within separate areas of the organization is no longer acceptable; when it comes to accuracy and efficiency, biotech entities that wish to succeed must invest in the right data management and digital platforms.

Let's assume your goal is to accelerate time to market for breakthrough products while reducing R&D costs. By making the push to digital transformation, you can start envisioning a world where:

Data is useable

Data across your R&D ecosystem is structured, standardized, cleaned, and combined to extract insights and generate predictive AI/ML algorithms. These can range from researchers using advanced modeling to design new molecules, or running silico simulations to select the strongest candidates before performing any costly experiments.

Data management on cloud-based platforms has been a driving force behind the advancements in biotech during the pandemic.

> **"Ubiquitous data, together with elastic, scalable cloud and edge computing, is part of what's enabling us to innovate and scale in such unprecedented ways."**
>
> **Jim Swanson**
> CIO, Johnson & Johnson

Communication is clear

With a shared digital platform, a shared language can be clearly defined and implemented.

In other words—you can talk to each other.

Scientists and partners use the same vocabulary and ontologies so that collaboration on projects is seamless. With a clearly understood shared language, you reduce redundancy and can collate data without manual intervention.

Everything is protected

Data is your gold; your competitive edge; your most valuable asset.

A digital, cloud-based platform protects this data by staying ahead of evolving best-in-class security and privacy practices. Whereas legacy security systems have holes that create higher risks for security breaches, a modern digital platform provides the infrastructure for proper data protection and backup, as well as identity/access management.

Roadblocks on the way to digital transformation

While the benefits of digital transformation are proven, they are often lost amidst misguided strategies or faulty implementation. Here are a few digital transformation roadblocks:

Hesitancy in moving to the cloud

Many businesses have security concerns and believe (incorrectly) that local data is safer. Misconceptions about how data is stored and protected can lead to the idea that information is more hackable in the cloud.

This is not true. Most cloud providers have their own dedicated security staff, and they are responsible for protecting all of their customers' data. Most importantly, your data is stored and replicated across multiple different data centers with regular encrypted backups, providing significant redundancy to minimize any data loss.

Data ecosystems don't work well together

It is crucial that data ecosystems can integrate and communicate with each other so data can flow easily between them. Data formatted from instruments, platforms, and other databases are often siloed with minimal push/pull. When this is the case, digital transformation fails and becomes a burden with extensive manual intervention.

FAIR-ification of new and legacy data

FAIR means Findable, Accessible, Interoperable, and Reusable—the four key components to efficient data management. This can be a roadblock because it takes significant time and conversation between teams. Every area of the company that is generating, storing, and using data must agree to a shared ontology that can be used across systems for sharing data. (The result however, as you'll read below, is well worth it.)

What does FAIRification mean, and why is it so important? Read more about how you can "Elevate your FAIR data management strategy with Benchling."

Takes too much time away from the "now"

Digital transformation requires taking a step back in order to take a step forward. Building a tech stack, adapting to a new platform, and rewiring your data management processes take time and training.

For many biotech companies with urgent goals at hand, this can be difficult to do. Despite the future benefits of digital optimization, adding additional tasks, jobs, and change management to the to-do list can be overwhelming and deemed less of a priority than the work at hand.

On the other hand, spending significant time on manual workloads and then cleaning, curating, and transforming data for analysis takes valuable time away from your researchers. Based on our survey with 600 scientists, scientists waste 18 hours per week on logistical, non-value added tasks. Isn't it time to take a step back to look at how to improve these processes for the decade to come?

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Read Benchling's "The Four Myths of Adopting an Informatics Solution," here.

Choosing the right informatics solution

Despite the roadblocks, the road to becoming a connected enterprise for digitally-augmented, modern R&D is worth the trek. The right informatics solution will guide you through this process and provide support as you digitize your processes, improve efficiency, and accelerate your time to market. That said, there are some key features to look for when choosing the right informatics solution.

Cloud-based

Look for a platform that offers an interconnected, cloud-based user experience. You should not need to log in to each application separately, or deal with disparate user interfaces. A truly connected R&D platform will operate with one ecosystem, wherein you can manage data, instruments, and analytics (AI/ML).

Security

One of the greatest benefits to digital transformation and using a cloud-based platform is the increase in security. Any quality informatics solution will make security a top priority; specifically, look for platforms that are aligned to the NIST cybersecurity framework, and in compliance with ISO/IEC 27001:2013 and SOC 2.

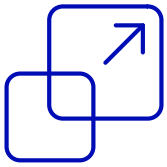
However, producing secure code and products with enterprise-grade security features is just the beginning. It is vital to choose a vendor that embeds security in their development and testing and subjects their systems to regular penetration tests. Security should be a crucial part of their culture—something that is evident in their investments and resources dedicated to protection, detection, and responsiveness throughout their company.

Compliance

With security comes compliance. The right informatics solutions will allow you to centralize enterprise data control, governance, and access by IT admins with compliance built-in.

You can also use the platform to maintain compliance with more detailed and readable audit trails, with the functionality for tracking data modifications. Admins can use the platform to view and manage user access at a more granular level, and control permissions at the project-, organization-, and data-levels. Together, these capabilities give teams the ability to track data changes at scale and manage access to important information.

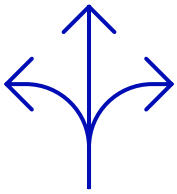
Scalability



If biotech has experienced anything the past three years, it's the need for agile, scalable solutions. Look for a highly scalable, performant system that allows teams to seamlessly scale data storage to billions of results while increasing throughput and accelerating work.

This means that teams can quickly find and use the data they need, whether they're searching through dozens of records or hundreds of millions.

Flexibility and ease-of-use



The world is always changing, and so is the biotech industry. That's why you need an informatics solution that is flexible, and adapts to the ecosystem that works for you. Solutions should adapt to *your* processes, not the other way around. Ideally, no matter how your existing informatics ecosystem is set up, your informatics platform will work the way you do.

That said, informatics platforms should allow you to make configuration updates in a simple, point-and-click interface. When researchers want to test a new process variant, they can set it up in minutes— without a single line of code. With an informatics platform, you can swiftly adapt to your processes, no matter how quickly they evolve.

Learn more about what to look for an informatics solution in Benchling's guide, "What to Look for in an Informatics Platform for Life Sciences R&D."

What to expect when you partner with Benchling

Benchling is a cloud-based platform designed specifically for biotech research and development. More than that, we are not a point solution—we're enablers of your success. Think of us as your partner.

What does this look like? Here's what you can expect when you partner with Benchling:

Open, extensible platform for standardized and usable data

The Benchling platform is an open system that connects directly with applications, instruments, systems, and data lake(s). Through its extensive APIs and a robust developer platform, Benchling integrates into an enterprise's complex ecosystem of software and hardware tools—supporting scientists' work across teams for rapid discovery of breakthrough products. Our experts have managed this integration with clients multiple times over, so Benchling has the know-how to get your team where they need to be.

Benchling R&D Cloud integrates with automation instruments like liquid handlers and analytical instruments to generate and process input and output files. Moreover, the lab automation application is interwoven with the rest of the Benchling platform to seamlessly register samples and manage inventory in real time for end-to-end sample traceability. This empowers R&D organizations to increase experimental scale, enhance productivity, accelerate time to milestone, and improve data integrity.

According to our survey of 600 scientists, scientists reported an upwards of 11 hours / week reduction in time spent on logistical tasks with Benchling.

Delightful user interface that promotes compliance and confidence

Adopting new digital platforms can be overwhelming. That's why Benchling has created a delightful user interface that makes it easy for your scientists to get up and running—so that they're actually excited to use your ELN.

Benchling provides a portal for scientists to "live in" and capture their experiments, observations, and results in real-time, in addition to being their system of record. With Benchling, Biogen and Sanofi have seen increased compliance, and scientists no longer see notebooking as an impediment, but as a helping hand.

> **"We're going to see a lot more groups that maybe didn't have any system in place really or weren't using anything other than excel spreadsheets—start to adopt this and be quite happy with the interface."**
>
> **David Sexton**
> Senior Director Genome Technologies and Informatics, Biogen

Once they've got the hang of the platform, the workflows and data management will transform. Data is only as valuable as its quality enables: capturing high quality, contextualized, and consumable data is crucial for true digital transformation. **As per our survey, having a central source of truth provided better data access and 50% more confidence in the data to help drive insights.**

Designed to support FAIR data for seamless data-sharing

Benchling is designed from the ground up to support F.A.I.R data—Findable, Accessible, Interoperable, and Reusable. By ensuring the right, FAIR data is captured from the start, you are building a solid backbone that can be leveraged to drive more efficient research and development.

Findable	Accessible	Interoperable and Reusable
By enabling the registration of entities (e.g. DNA, RNA, proteins, cell lines, etc.) with unique ID and persistent HTTP URLs, data is easily findable within Benchling's platform.	Benchling makes data accessible over the web through a UI for humans (HTML) and through APIs for machines.	Data is available for annotation with rich metadata using community standards, formats and ontologies.

Benchling's unified platform architecture natively centralizes all data, which allows you to link each data point to its useful context —such as previous entries, or protocols—as well as to associated data points, such as related samples or reagents. **Now, since everyone is using the same vocabulary and ontologies, as per our survey, scientists observed a 2x improvement in collaborating on projects within and across teams.**

Our **open APIs** allow you to bring your legacy and new data together so that it can be used in a more efficient way. Our technical solution consultants have handled data migrations from legacy systems, custom systems, and generic tools such as paper and Google Workspace. With their help, we'll ensure that your data is top-quality and properly managed—opening up new possibilities for mining data more effectively, and driving valuable insights throughout the R&D pipeline.

Extremely high customer satisfaction (thanks to our team of pros)

Partnering with Benchling means partnering with our **highly qualified team**, mainly PhD and Masters-level scientists with deep software expertise.

Your dedicated team of Benchling experts work with you every step of the way, from implementation, onboarding, and in-depth training through post-live support and education.

We start by working closely with you to understand your unique business and scientific goals. We then work with you to design a solution to meet those goals.

After implementing this strategy in our platform, **our customer success team** is dedicated to delivering on your goals post go-live. Our dedicated team of experts creates bespoke documentation, carries out training for each of your teams, and works with you every step of the way to help with change management. We also provide you with usage reporting on the metrics you care about most, including check-ins and business reviews to ensure you're realizing the maximum value from our product.

For long-standing satisfaction, **our managed services team** engages with our customers to educate and guide them on configuration changes for new or existing workflows, additional integration building to your broader tech stack, and validation services.

This high-touch point approach has proven successful; more than 99% of Benchling clients continue with Benchling after their first year with over 95% satisfaction score (CSAT).

Statistics

99%

of Benchling clients continue with Benchling after their first year.

95%

Benchling clients give the platform a 95% satisfaction score.

Note: Our implementations can range from as little as 25 days to 6 months, depending on the complexity.

Top-notch security driven by true leaders in the field

Benchling R&D Cloud was built from the ground up with core tech foundational elements in mind: scalability, security, and compliance. That said, security has always been and will continue to be a top priority in building and deploying our system—as evidenced by our alignment and compliance with all the major security frameworks (NIST, ISO/IEC 27001:2013 and SOC 2) and privacy standards (EU-US Privacy Shield, C5, GDPR, NCSC and CCPA.)

Additionally, Benchling's platform has been assessed and passed by internal and external security firms, and multiple large global biotech companies. In order to maintain security, we go through this process multiple times per year.

Benchling's data records are designed not only for accuracy, but also for easy retrieval by its customers, in accordance with the Electronic Record and Electronic Signature (ERES) requirements outlined in the 21 CFR Part 11 guidance. Data and communication is protected at rest using AES 256-bit encryption, and in transit using Transport Layer Security (TLS) encryption or higher. Customer data is at minimal risk of loss due to Benchling's high-redundancy data storage practices. Raw files are stored in AWS S3 buckets and structured data is stored in Postgres databases, which are configured with synchronous replication to encrypted daily and weekly backups. Encrypted backups are replicated across multiple geographic regions for higher redundancy.

This is a platform built for *you*. To that end, we have implemented security measures to protect your data through centralized enterprise data control, and governance and access by IT admins with compliance built-in.

Benchling maintains compliance with electronic signatures and detailed human readable audit trails, which include functionality for tracking data modifications. In addition, admins can view and manage user access at a more granular level, and control permissions for projects and folders, as well as at the data (run and result schemas) level. Together, these capabilities give teams the ability to track data changes at scale and manage access to important information per 21 CFR Part 11 and Annex 11 regulations, in the U.S. and E.U., respectively. Benchling also provides a Validated Cloud with comprehensive documentation and packages for GxP environments to help achieve regulatory accreditation and reduce customers' validation burden.

Future-focused and future-proof platform

Benchling is also cloud-based, which ensures that the organization can continue to innovate and future-proof investments. After all, you don't want a new platform that will feel obsolete within two years of getting it fully implemented—you want something that can grow *with* you.

At Benchling we've learned that being future focused means adapting to change. That's why our cloud-based platform is flexible, and it's easy to configure new workflows and support new modalities in a low code way. We're also releasing new products every three months, like Benchling Workflows and mRNA design tools, in line with the evolving needs of modern R&D. Our focus is on advancing science with rich roadmaps— in fact, we have a team of over 250 solely dedicated to developing new products.

To maintain and extend Benchling R&D Cloud as easily as possible, we also work with **a network of partners** including Accenture, Cognizant, and Zifo to support your growth.

The era of biopharma digital transformation is here

Biotech is at an important crossroads, and the decisions made by each enterprise will determine its fate for the next decade. The choice is clear: adopt a digital transformation strategy, or fall behind. Are you prepared for the era of digital transformation?

> **"Successful companies will turn focus away from sunk costs in legacy systems designed for the pre-2019 era, they will embrace a vision of the technologies needed to support a future in which ways of working will be fundamentally different."**
>
> **McKinsey and Company**

Think of Benchling as your guide into this next step of digitization. Our platform is the answer for biotech organizations that need an easy and affordable solution to collect, manage, and analyze data from R&D experiments.

Our vision is a world where big data is used to create accurate and complete records of all research in real-time, resulting in more informed decisions based on better data.

We've already helped hundreds of companies accelerate their R&D processes, increase their productivity, and streamline the way they collaborate with partners.

If this sounds like the next step for your company, **let's work together.**