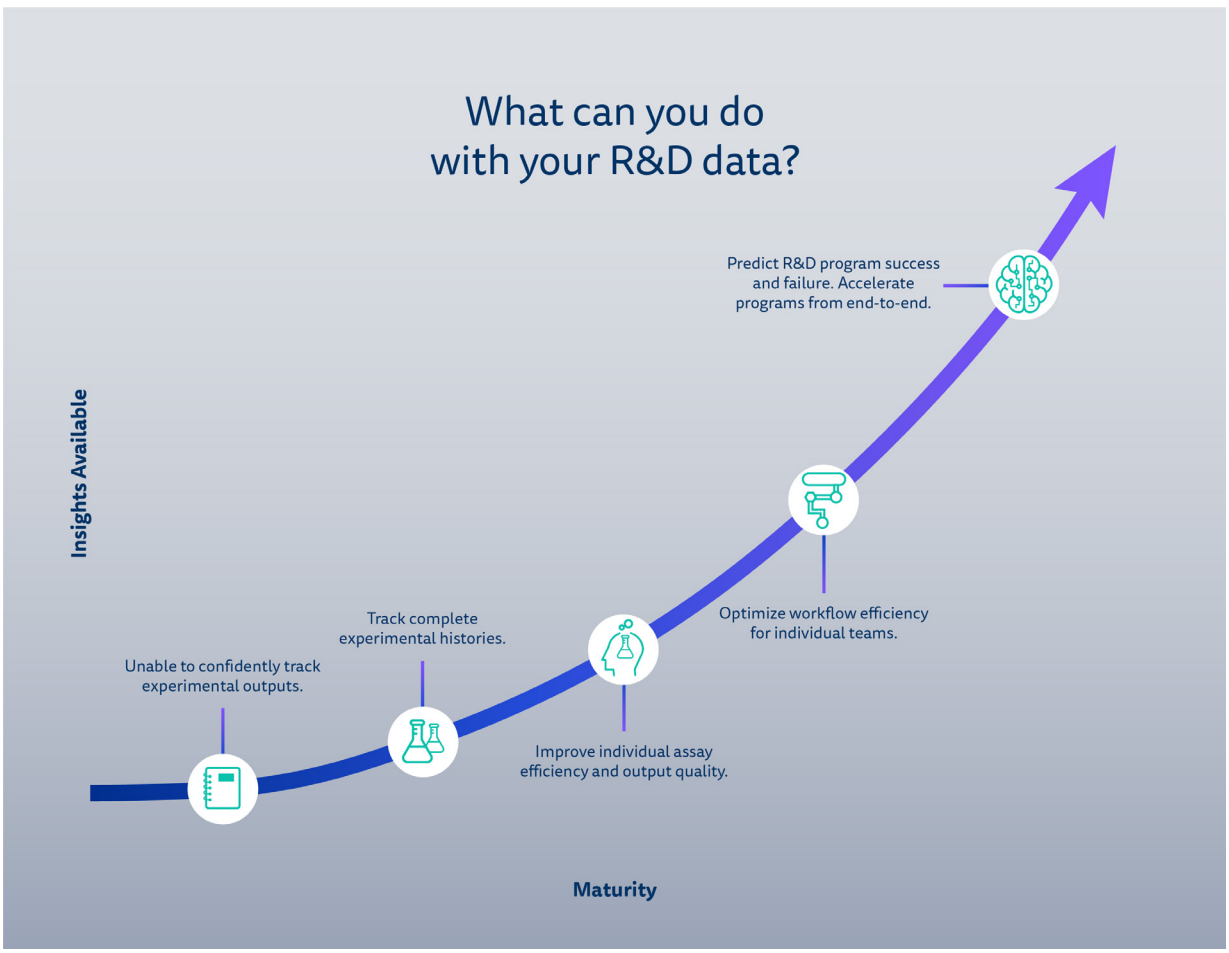
Benchling

The R&D Data Maturity Curve

R&D organizations are only as good as their data. Compared to traditional small molecule R&D, getting to “good data” in the emerging modalities of large molecule R&D is more challenging. Extracting insights from large molecule R&D data is an even greater challenge.

To measure and improve your competitive position, benchmark yourself with Benchling’s R&D Data Maturity Curve. Here, we outline the five main levels of data maturity, as well as concrete next steps to help you to take your data to the next level, no matter where you are today.



LEVEL 0

Unable to confidently track experimental outputs.

How many cell lines is your cell line development team producing? Which antibody lots did those cell lines produce? Which fermentation runs took place yesterday? Questions such as these are difficult to answer using spreadsheets, legacy software, and point solutions. Many organizations at this level work with data that's inaccurate, incomplete, or unreliable. Unless R&D data is centralized and interconnected on a single system, the accuracy and completeness of your data will always be questionable.

NEXT STEPS

Tracking experimental outputs is the foundation of any R&D data strategy. At this stage, certain R&D organizations choose to integrate a number of point solutions with a custom database in an attempt to centralize data. However, this approach creates a brittle data infrastructure liable to frequent breakages, and it depends on disparate systems' data being completely accurate and up-to-date. Most organizations at this stage take the platform approach, in which they purchase a central informatics platform to serve as their single source of truth and power their data strategy for the next levels.

- Learn about the importance of adopting a platform over point solutions
- Learn what you should look for in an informatics platform
- Learn how to run an informatics platform evaluation

LEVEL 1

Tracking complete experimental histories.

With a modern informatics platform in place, companies can trust in the accuracy of the data their R&D teams are producing. At this stage, companies can trace the full experimental history of any candidate and view every experiment that contributed to it. In addition, these organizations can measure the productivity of individual R&D teams to ensure the overall organization is on track to hit milestones.

NEXT STEPS

Tracking experiments is one thing, but applying learnings to improve assay efficiency and output quality is another. Identify core assays which, based on the rate at which they're producing outputs, seem like they'd be good candidates for improvement. Make sure you're tracking key metrics for these assays around speed, output quantity, and output quality – and make sure your informatics platform is set up to associate results back to the specific assay runs that produced them.

LEVEL 2

Improving individual assay efficiency and output quality.

Companies at this stage are able to programmatically evaluate the efficiency of specific assays by associating assay data and metadata back to individual runs and analyzing it across runs. These companies regularly and easily answer questions such as, “What conditions led to the highest protein yields?” and have established a culture of improving R&D processes based on data.

NEXT STEPS

Ensure your informatics platform’s workflow application is configured to support core R&D processes. Set up a dashboard to track key metrics around workflow speed, throughput, and results. Think through which parameters it makes most sense to modulate in service of optimizing each particular workflow. For each workflow you intend to optimize, integrate all relevant instruments with your informatics platform to automate data extraction.

LEVEL 3

Optimizing workflow efficiency for individual teams.

Beyond just improving the efficiency of individual assays, companies at this stage are able to evaluate and optimize entire intra- and inter-team workflows. What combination of parameters leads to the most successful fermentation runs? What are the biggest bottlenecks in your cell line development workflow? Whenever a workflow changes, these companies make it a point to have a framework in place for testing and optimizing that workflow.

NEXT STEPS

Structure executive-level dashboards to: Track program progress across teams. Identify which stages of your pipeline are prime bottlenecks. Track candidate/product performance relative to past successes and failures.

LEVEL 4

Forecasting R&D program success and failure. Accelerating programs from end-to-end.

At this stage, companies have developed the capacity to accelerate R&D from the granular level of individual assays, to the broader level of the entire program lifecycle. They have also developed a deeply engrained culture of using data to improve processes at all levels of the organization. They not only push their programs along faster than their competitors – they also identify failure faster than competitors. With an informatics platform that centralizes data throughout the organization, integrations that extract data from instruments and automatically associate it with sample records, and dashboards that track programs across teams against historic benchmarks, these organizations operate at the forefront of their fields.

The bottom line: Cultivating a culture of data

R&D organizations are only as good as their data, but data is only as good as the people producing and interpreting it. You can purchase all the data management tools in the world, but at the end of the day, if you aren't internally reinforcing the importance of data - and keeping it in mind as you make hiring decisions - then your organization won't make the most of its data. Putting in place a concrete data strategy, informed by what you're getting out of your data today and what you hope to in the future, is critical to cultivating a culture of data-driven decisions throughout your organization. Only with widespread organizational buy-in can you harness the full power of your R&D data.