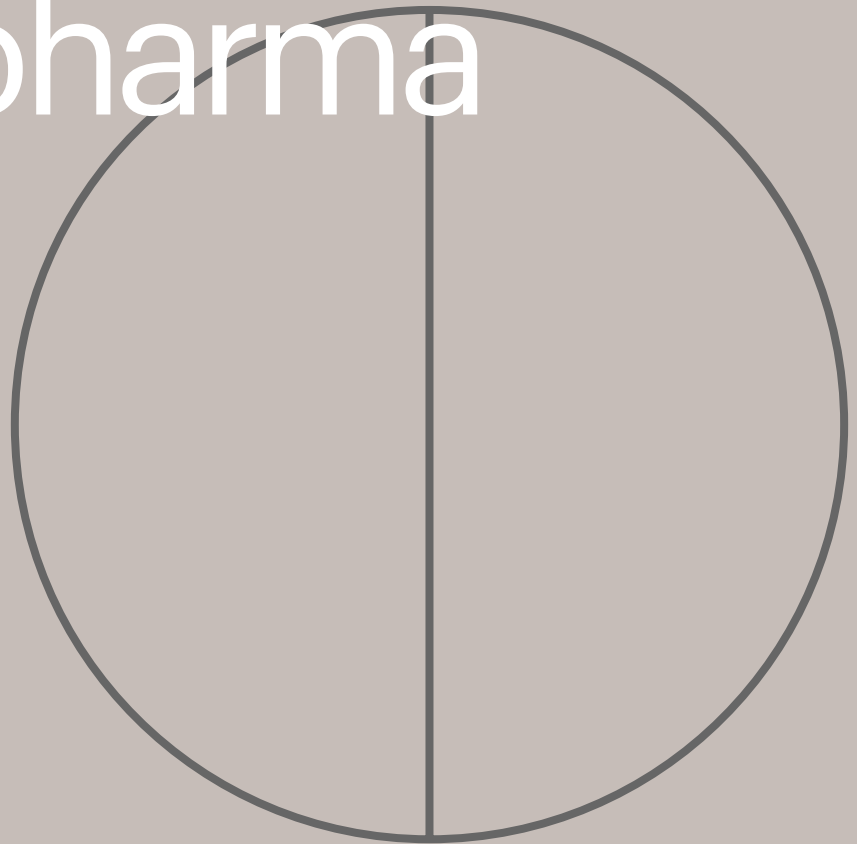# Measuring the Value of a Digital Transformation in Biopharma R&D

Benchling

Introduction

The biopharmaceutical industry is in the midst of a speed-to-innovation revolution. The pace of recent achievements is truly unprecedented. A process that used to take at least a decade and a half, at best, can now wrap up in a few years. Pfizer / BioNTech and Moderna, for example, were able to create, test, and bring to market a new class of mRNA-based vaccines for COVID-19 in under a year. Amgen recently achieved FDA approval for a first-in-class drug targeting a particular KRAS mutation in non-small cell lung cancer, a target previously thought to be "undruggable"; the entire drug development journey, from concept to approval, was completed in just 8 years. While these kinds of accomplishments were barely conceivable in the past, they are now becoming more commonplace.

Digitization vs. Digitalization: What's the Difference?

In this context, digitization refers only to the translation of analog data into a digital format. An example of digitization might be scanning a sheet from a paper lab notebook to create a PDF version of it. Nothing fundamental to the business changes here; you've simply created a digital record of something inherently analog. Digitalization, on the other hand, refers to a paradigm shift. It is a transformation of business processes so that they are fundamentally digital-first. Instead of recording notes on paper and scanning them in, scientists don't use paper at all. Their workflows center completely on unified digital systems for record keeping, experimental tracking, and analysis.

Still, biopharmaceutical industry executives are increasingly aware that reliably repeating success of this caliber requires a robust, unified digital informatics solution for their R&D data and processes. As speed and efficiency become more vital in such a competitive market, and as data collection and management become more complex, comprehensive digitalization of R&D is not only helpful, but crucial to winning the race for the next cure. Legacy systems, including isolated and inflexible kinds of software, put a drain on progress by limiting knowledge transfer, siloing data, and wasting precious time on data management. Implementing a modern system designed for complex science has the potential to significantly increase productivity, improve collaboration, enhance data integrity, and bolster scientific and operational decision-making. All of these factors contribute to the most important goal of all: getting safer drugs to patients faster than ever before.

The most innovative companies are already making this happen. Enveda Biosciences, for example, a company that uses machine learning and computational metabolomics to discover small molecule therapeutics, reported a 230% increase in speed to discovery when the team

implemented a unified digital platform.
Still, for many companies, questions remain.
Among them: if we move from our legacy systems
into new, digital solutions, how do we measure the
associated operational improvements? How can
we know they are happening in a way that has a
concrete, positive impact on the company and its
business goals, thereby justifying the investment
from a business perspective?

In this Benchling Perspective paper, we'll
provide some answers. After delivering digital
transformations to hundreds of companies, and
helping many of them measure the impacts of
these transformations, Benchling has developed
a solid and repeatable framework. This framework
can help your company assess its digital maturity
and develop personalized value metrics in order to
measure the business value of a digital informatics
platform. This way, your company has the
potential to not only experience the benefits of a
digital transformation, but be able to understand,
articulate, and share how this kind of platform can
help you achieve your R&D objectives and get
therapies to patients more quickly.

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Chapter 1

Digital Transformation as a Strategic Priority

Biopharma companies that undertake a digital transformation of their R&D processes have been able to solve many pressing problems, both operational and scientific. As a result, they are realizing the business impact of their choice every day. For example, scientists on Benchling have been able to reduce the time they spend on lower-value data management tasks by ~60%, giving themselves back an average of ~10 hours a week to spend on higher-value activities like experimental design and analysis. In the near-term, this helps increase productivity, and in the long-term, it helps shorten R&D timelines.

In addition to increasing their average speed to discovery by 230%, Enveda Biosciences improved data integrity by 130% when they implemented a unified digital platform, and 66% of scientists said it gave them a more cohesive view of experiment progress.

Enveda
BIOSCIENCES

For many innovative companies, these tools have become key to solving both the short- and long-term challenges they face. Those who invest now are winning the R&D race — they are bringing their solutions to clinical trials, and to the patients who need them, in record time. Meanwhile, those who stick with isolated, inflexible solutions such as paper notebooks, Excel spreadsheets, and standalone electronic lab notebooks (ELNs) are falling behind in innovation and access to new and growing therapeutic markets.

Digital R&D transformations deliver tangible business value

Overall, biopharmaceutical companies aim for two goals. First, companies want to improve their ability to make critical decisions, so that they are able to identify the right drug to advance to the clinic and thus improve their probability of success. Second, they want to shorten development timelines. Bringing drugs to market in a few years instead of ten or twenty means reaching a greater number of patients far more quickly, capitalizing on exclusivity, and maximizing business success.

Digital R&D solutions can enable and accelerate the achievement of both of these goals. Through facilitating, streamlining, and improving many crucial aspects of a biopharmaceutical team's work, these solutions can:

Increase scientist productivity
By eliminating the need for tedious, time-consuming tasks, such as combing through data stored in a variety of formats and locations, scientists can move through processes and analyze results with increased speed and accuracy.

Improve collaboration across teams and with external partners
When all stakeholders have access to the data they need in one central location, there's less need for knowledge and data transfer over slower, inconsistent means, such as email, reducing unnecessary confusion and delay.

Enforce data integrity
When data generation and collection are standardized for use in a single platform, it's much easier to ensure consistency and quality.

Accelerate R&D insights
A single source of truth helps leaders see data from a bird's-eye view, as well as an interlinked, granular view, driving a quicker, deeper understanding of experimental results and what they mean. More transparent, streamlined processes can also help identify and resolve the bottlenecks that impede progress.

Reduce R&D costs by consolidating IT systems
Choosing one customizable platform that performs a wide range of R&D tasks is both simpler and more cost-effective than adopting separate software systems for each task, which often means paying more for multiple systems that don't integrate well.

Early adopters of digital R&D tools have struggled to measure value

For all of the above reasons, biopharmaceutical executives recognize that digital informatics systems are becoming a clear necessity. But they're not all racing to adopt.

According to a recent Accenture survey of approximately 250 pharmaceutical executives, 72% agree that digital transformation is critical to achieving R&D imperatives. Yet only 36% are actively adopting this kind of transformation. The other 64% see the decision as "risky" and either remain in early-stage exploration of the idea or are simply waiting and watching their competitors to see how they benefit.

Statistics

Pharmaceutical executives agree that digitalization is a priority, but only 36% of them are taking action.

72%
agree that digital transformation is critical to achieving R&D imperatives.

63%
are actively adopting this kind of transformation, but...

60%
of the early adopters of digital have not been able to measure success from the transformation thus far.

64%
of executives see the decision as 'risky' and are taking a 'wait and watch' approach.

Source: https://www.accenture.com/us-en/insights/life-sciences/driving-digital-biopharma-rd

Although waiting and watching almost certainly puts a drag on progress and speed, one perceived barrier to making the leap is that many companies that invest in a digital solution struggle to effectively measure the business value of the choice. According to the Accenture study, over 60% of the early adopters of digital have not been able to measure success from the transformation thus far.

This doesn't mean success isn't happening; it simply means it's been difficult to articulate that success. And, of course, articulation is important. Measuring actual business impact can help justify the change management and investment required for these technologies and further encourage and support adoption across the organization. Those who choose a digital solution and choose to measure its effectiveness are far more likely to be able to streamline their processes, deepen their insights, and shorten their timeline from discovery to market.
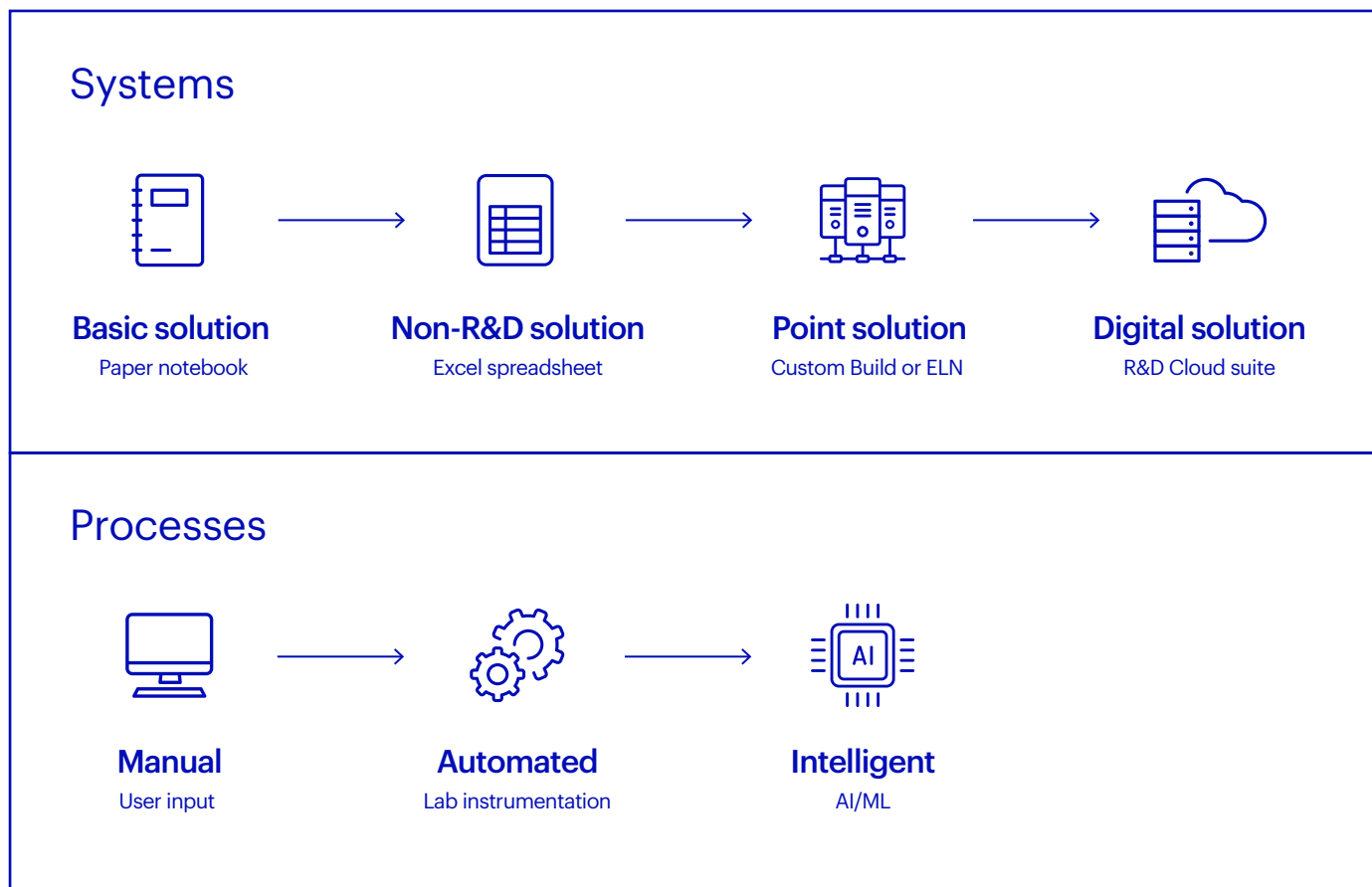
Chapter 2

How to Build a Business Value Case

The good news is, building a case for the business value of a digital transformation is not as complex as it might sound. There are three main steps. First, you have to assess your digital maturity. This means investigating your current practices when it comes to data management and lab processes so that you can build a deeper understanding of any barriers you might face and develop appropriate goals. Given where the organization is right now, where do you want to be from a data and process management perspective? Next, based on the barriers uncovered during the maturity assessment, define quantifiable value metrics, such as total time spent searching for data or the turnaround time for a common assay request. Lastly, measure the business value by quantifying the actual value realized from the digital solution. Let's take a look.

Assess Your Digital Maturity

To start, it is important to honestly assess your digital maturity by evaluating the systems and processes used across your specific scientific use cases. Ask questions based on your current R&D data and process management systems.

Systems

Basic solution
Paper notebook

Non-R&D solution
Excel spreadsheet

Point solution
Custom Build or ELN

Digital solution
R&D Cloud suite

Processes

Manual
User input

Automated
Lab instrumentation

Intelligent
AI/ML

For example, you might ask:

Are we tracking samples and data in paper notebooks or across multiple spreadsheets? Or do we rely on custom in-house solutions that may lack flexibility or are difficult to maintain?

Do our existing digital solutions and ELNs integrate across systems, or do we need to juggle between software to find the data we need?

Then, ask questions around your current data capture and sample tracking processes. Are they efficient? And do they enable quick insights?

For example, you might ask:

Are our end users primarily capturing results by hand? Are they manually linking entities? Or do the systems do this automatically?

Are we leveraging lab instrumentation to automate workflows and data capture?

Do our systems help proactively forecast and plan experiments, or even intelligently perform certain activities for users?

Think critically about the answers you come up with here. For example, if you're capturing sample lineage, protocols, results, and inventory locations manually in a physical lab notebook, transcribing the results to an Excel spreadsheet, and then sharing with a colleague, you may classify digital maturity as low in this area, as it is clearly a manual, disconnected process prone to error, and it would be difficult to accurately track and share data.

Consider these questions and answers across multiple dimensions, such as productivity, collaboration, process management, and insights. This can help you establish a baseline understanding of your digital maturity right now, and define your current limitations. In the process, you will develop a better understanding of where you need your R&D to be to optimize your research programs and practices.

Define Value Metrics

In this step, it is important to use your findings from the maturity assessment to clearly outline, more tactically, the specific data and process bottlenecks you face, then turn those into measurable value metrics. For example:

Limitations		Value Metrics
Non-standard data capture	—	How much time is spent on data capture and search?
Email-based request management	—	What is the turnaround time for an assay request?
High error rate	—	How many errors are forcing repeat experiments?
Data silos across systems	—	How easy is it to share data with your team?
Low data quality	—	How confident are you with your data quality?

Once you have both of the current limitations and the associated, measurable value metrics, such as time spent on data capture and search, you can begin to measure the expected or actual business value from the digital solution. If the solution is yet to be adopted, you can gather these current state metrics through internal surveys and discussions, then extrapolate the future impact. Keep in mind, as you explore options, that it is important to work with a digital vendor that tracks value at this level across its customers so that you can accurately benchmark the solution's expected efficiency gains. At Benchling, for instance, we use these frameworks to measure business value across many of our clients in life sciences R&D.

Measure Business Value

At this stage, you'll see that a digital platform can provide some very specific benefits. For example, turnaround time for an assay request may be reduced to under a week with a unified digital informatics platform, compared to the two to three weeks it took previously. It also might be that manual data entry or disorganized sample tracking has resulted in errors that force repeat experiments several times a month. With a platform that dramatically improves data capture and sample tracking, the number of errors each month could drop to zero, expediting timelines and reducing extra costs. These sorts of concrete, measurable values can help you prepare a value report or calculate an expected ROI.

You can even track these metrics and update them over time, as the digital solution is progressively adopted by additional teams across your organization.

Value Metrics	Value	Impact
How much time is spent on data capture and search?	9 hr/wk ⟶ 3 hr/wk	Improve productivity
How much time is spent on data capture and search?	9 hr/wk ⟶ 3 hr/wk	Shorten timelines
How much time is spent on data capture and search?	9 hr/wk ⟶ 3 hr/wk	Eliminate errors
How much time is spent on data capture and search?	9 hr/wk ⟶ 3 hr/wk	Improve decision-making
How much time is spent on data capture and search?	9 hr/wk ⟶ 3 hr/wk	Higher revenues
		Positive ROI

Shorten your path to innovation

Digital R&D can impact biopharmaceutical operations at multiple levels — from scientist productivity on a daily basis to overall development timelines over a period of years. To put this impact into perspective, let's look at it over multiple time intervals:

These are just examples of positive impacts some biopharmaceutical companies have experienced in the short and long term from the implementation of a digital informatics solution. From productivity and collaboration improvements to cost savings and better insights, many concrete benefits are possible. When going through the process of determining value metrics, though, it's important not to over-index on a single dimension like productivity, because value aggregated across multiple dimensions ultimately delivers the greatest impact to the organization.

Daily	Weekly	Quarterly	Yearly
Time saved on data and process tasks improves scientist productivity	Improved cross-team collaboration streamlines and expedites workflows	Improved data integrity and accelerated R&D insights enhance scientific and operational decision-making	IT system consolidation will decrease R&D costsThe culmination of these benefits help shorten time to milestone and get the right drug into the clinic

Conclusion

Real-World Business Impact

From COVID-19 vaccines to cancer treatments and hundreds of other therapeutics, the biopharmaceutical industry is in an increasingly intense race to succeed. Fundamentally, success means being able to swiftly bring to market the drugs and critical therapies people need to live healthy lives. Knowing what decisions to make to ensure that success is much easier said than done. But if you look at specific aspects of the work that are and aren't working well — and if you start to break these things down according to definable metrics — you'll be able to identify problems and present actionable solutions. A unified, cloud-based informatics platform for biopharmaceutical R&D is one big solution for many smaller operational and scientific problems. And hundreds of companies, including Regeneron, Gilead, Sanofi, Sana Biotechnology, and Editas Medicine, are already using these solutions — and seeing the business value they bring — every day with Benchling.

Here's one example: A global biopharmaceutical leader developing antibody and cell-based cancer therapies struggled with a range of data maturity issues. Data silos and manual processes hampered productivity, collaboration, and the ability to maintain sample and experiment traceability. Finding data and reporting on it was tedious and challenging, and study planning, forecasting, and resource management were persistent pain points. After implementing the Benchling R&D cloud platform, in less than a year, the company saw:

63%
reduction in time spent on data capture, search, and collection

75%
improvement in ability to track sample and experimental data

2X
improvement in ease of transitioning sample & experimental data across the scientific workflow

>2X
improvement in ability to forecast, review, approve, and track studies

Benchling continues to work with this biotech leader, and other companies of all sizes, as they grow and develop, helping them deepen their digital transformation and achieve their ultimate R&D objectives. As a result, more and more companies are shortening their path to innovation, improving human health, and achieving business success.

With Benchling, you get a modern system that will adapt to your organization's particular strategic needs and help bring breakthrough therapies to market faster. Reach out to Benchling for a custom demo, or if you would like to engage with our Business Value Services practice to see how Benchling can impact R&D at your organization.

Request a Demo