# The Potential of Predictive Algorithms in Product Development

**Every product development project is unique.
While this makes R&D exciting, it also makes it unpredictable.**

For one thing, knowing exactly how long your project will take—and how much it will cost—depends on you having an accurate understanding of its complexity. It also depends on you knowing how productive your teams are. This can vary based on the number of team members working on the project, different development styles, and the time that each team member needs to spend to complete their tasks.

Historically, the only way to forecast project costs, deadlines, and possible revenue generation was to do so either manually or with templates. The former method is time-consuming and inconsistent. The latter, while perhaps more time-efficient, still requires frequent manual adjustments—which again results in inconsistencies.

But thanks to the evolution of AI and Machine Learning, predictive algorithms can now help you make much more accurate forecasts. This means more reliable timelines and budgets. It also means better insights that will not only impact the success of your current project but will also help your PMO achieve its strategic goals.
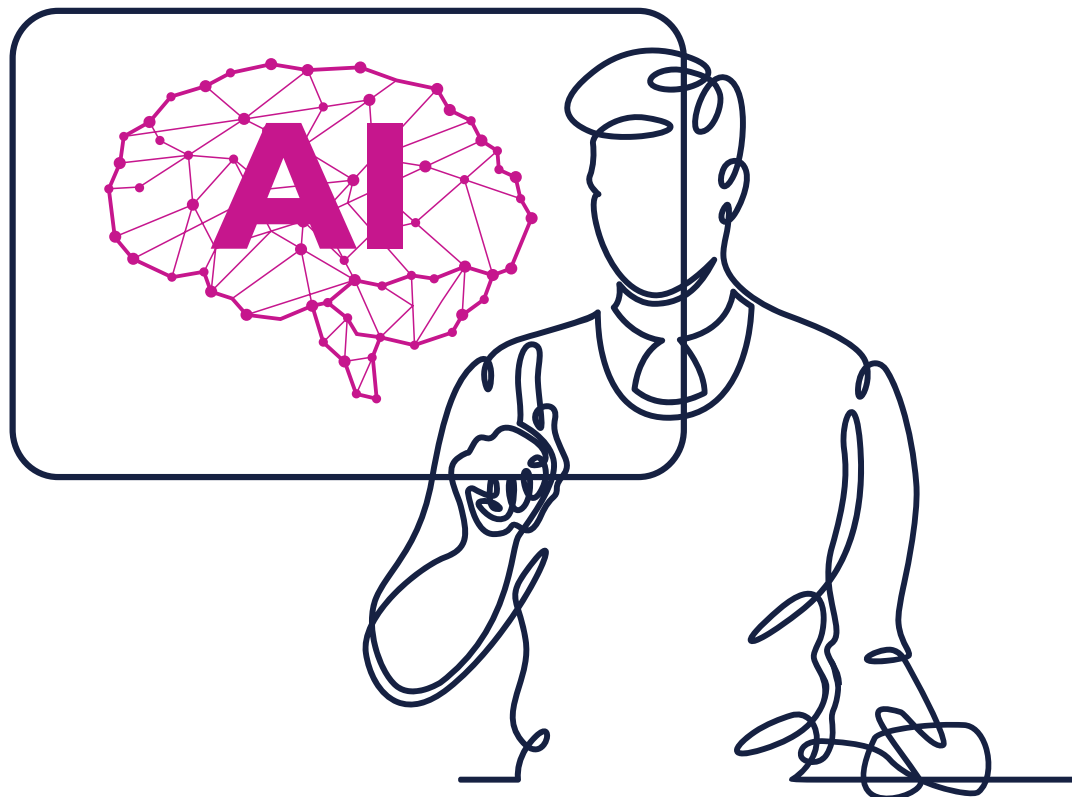
Manual

The forecast is created by SMEs manually

- Initial input may be very time consuming
- Estimates depends on the expertise of the user
- The forecast may be inconsistent from project to project

Templated

The forecast inherited from the templates or libraries

- Quick initial set up
- Frequent manual adjustment depending on the use case
- Adjustment may not be consistent depending on the SME

Algorithms

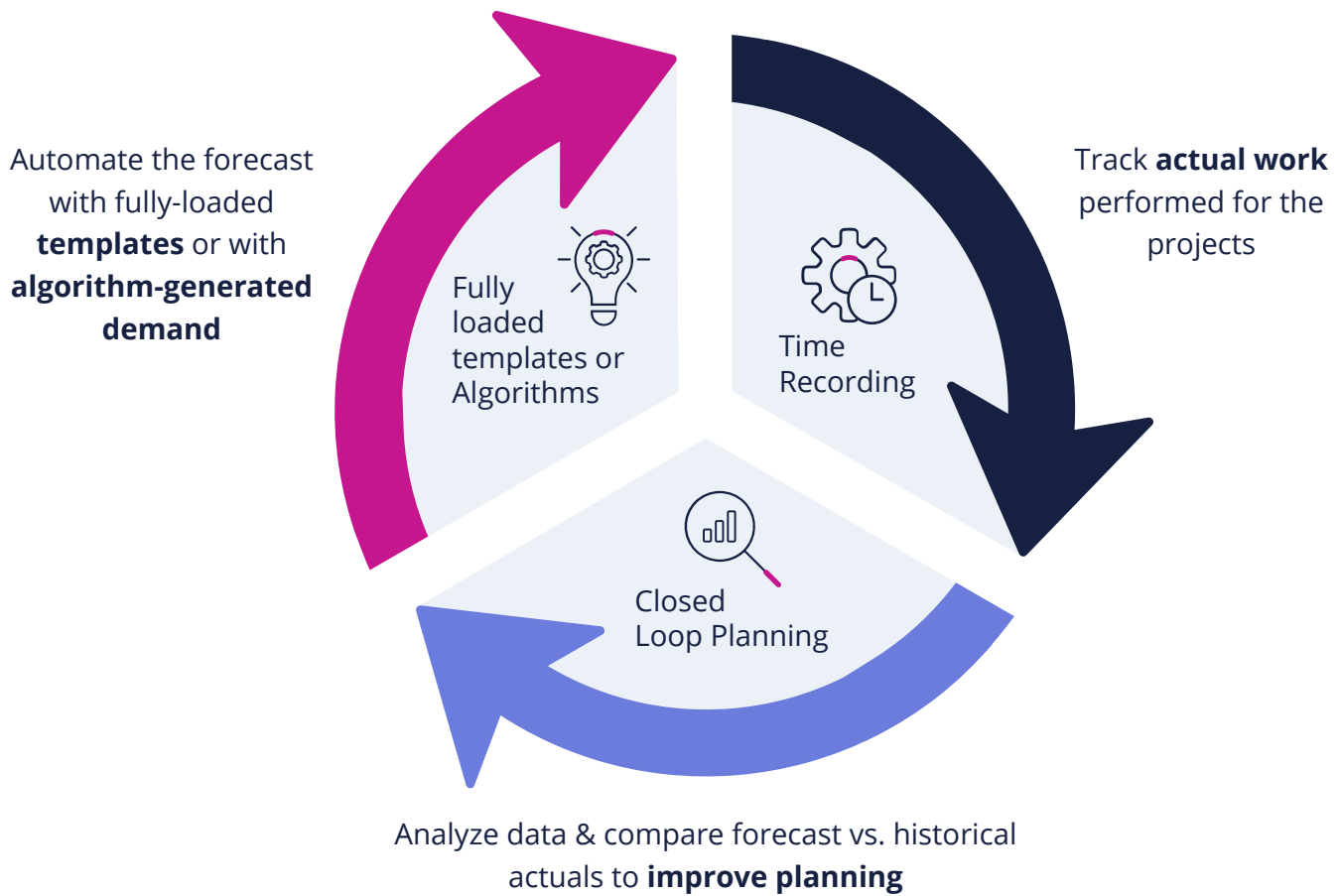The forecast generated automatically and takes drivers into account

- The output depends on project attributes or task attributes
- This method does not rely on the expertise of each individual PM or RM
- Consistent but defining equation may be difficult initially from project to project

RELIABLE PREDICTIONS BACKED BY QUALITY DATA

Predictive algorithms work so well because they're mathematics, and math is objective. You put the data in, and you get results out, so you know how many people, machines, and facilities you'll need to achieve your end goal.

This enables a consistent approach to planning. It's also one that continuously improves the more data you put in. Essentially your algorithms will get better as your organization becomes more mature, so your predictions become increasingly reliable.

Let's say you're in the planning phase for your product development and want to know your expected ROI so you can build a business case. Without predictive algorithms, you would have to scour past projects for high-quality data points that you would then load into an Excel sheet. Then, it would take a team of data specialists months (if not longer) to come up with a forecast of the revenue you may generate.

Automate the forecast with fully-loaded **templates** or with **algorithm-generated demand**

Fully loaded templates or Algorithms

Time Recording

Track **actual work** performed for the projects

Closed Loop Planning

Analyze data & compare forecast vs. historical actuals to **improve planning**

But with predictive algorithms, you can take your historical data and analyze it at the touch of a button. Furthermore, the calculations of one data set will help inform the calculations of other data sets. Indeed, if you want to know your expected product revenue, it makes sense to break it down into the following stages:

1

Resource load

To predict the number and types of resources you need, you'll need historical data on similar projects and the roles, materials, equipment, and facilities used.

2

Timelines

If you know the roles and the number of resources necessary to complete the project, and how long it took them in the past to complete similar projects, you can run predictive algorithms to forecast your estimated product delivery date.

3

Resource costs

Once you know how many of each resource you need for how long, you can then use that data, as well as information on resource prices, to forecast costs. The data on prices should include the internal costs of team members' time and the cost of hiring/ buying external resources.

Then, with a firm understanding of your costs and timelines, you can begin forecasting your expected revenue and, in turn, your ROI. And as your organization matures, you'll have the ability to draw upon different data sets to give a fuller picture of your product potential. You could even run multiple algorithms to address various scenarios or complexity drivers and decide your course of action based on the best set of results.

This is where you can get to when you've reached significant maturity. You can build multiple algorithms and have them work together, essentially informing each other and enabling you to gradually tweak them to improve the results with each run.

This is a bright future. And it all starts with a single spark - that first build around resource planning.

PREDICTIVE ALGORITHMS IN LIFE SCIENCES

Nowhere is the potential of predictive algorithms realized better than in the pharmaceutical industry. Some pharma companies are at the leading edge of what you can do with a combination of AI, ML, and high-quality data.

Seeing a drug from protocol writing all the way through to FDA dossier submission consists of many stages. Projects are long and likely to require many highly skilled resources along the way. Therefore, before entering into the development phase, companies want to understand if the costs of the project balance out.

Just like a relatively new organization, a mature pharma company will still start by interpreting its resource load. But when forecasting timelines and costs, it will also take into account the following:

Internal risks

Say you identify the need for XX number of clinicians, but you simply don't have that number on-site. You could then decide to hire to meet demand. Or, if you have multiple sites and transparency over their capacity, you could shuffle and reallocate resources, so your project meets its requirements.

External risks

This could include materials shortages due to geopolitical tensions and the over-extended dependencies and increased costs that may ensue. Or, perhaps there's a looming skills shortage due to a reduced number of students training in the roles you'll need down the line.
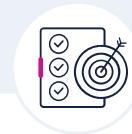
Marketplace trends

Data on competitor projects for similar products could impact your timeline, for instance. You may choose to release your product earlier, which could mean taking on more resources or increasing allowed overtime—which will both come at a cost.

THE BUSINESS CASE FOR BUILDING PREDICTIVE ALGORITHMS INTO YOUR PRODUCT DEVELOPMENT

Life sciences are at the higher end of maturity when it comes to the amount of project data they have. But quantity and quality aren't the same thing. Some pharmaceutical companies may start with thousands of data points—but once they cleanse and analyze them, they realize there are only a few hundred that they can use for their predictions.

Wherever you are on the maturity scale, you'll want to know what kind of data to focus on. Imagine this scenario: your company specializes in the production of rubber for both tires and gumballs. As such, you have two production lines, one for each product. Predictive algorithms will show you when each line has the capacity to switch to the other product, making full use of resources and increasing output and ROI.

As you mature, you can expand upon the data you use to improve your insights. For example, by inputting the data from risks and trends, you can predict the cost of expediting processes to meet a market window and compare it with the impact of not doing so. Will it impact sales, and if so, by how much? If the cost of the expedition outweighs any revenue lost in late delivery, it's not worth the effort.

Now apply this example in the context of developing a convertible. If you miss your pre-summer launch date, you'll have to wait an entire year for release as the demand simply won't be there until then. This will mean a massive knock to your sales and revenue creation, which could put the validity of your entire project into question.
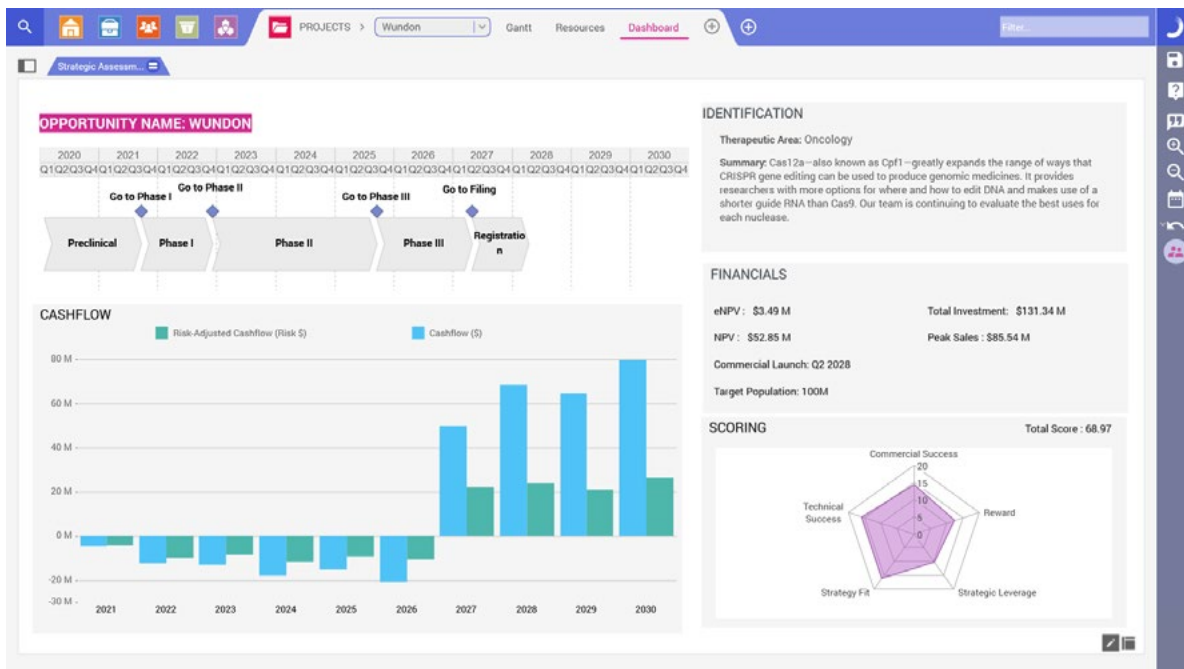
Example of a one-page snapshot for a life science executive with a summary of the project's ROI.

A CLEARER PATH TO YOUR STRATEGIC GOALS

Let's elevate this one step further.

Imagine you're in the initial planning stages of a new product development. You want to validate the viability of the development against projected sales.

> " *With predictive algorithms, you can sidestep doing extensive (and expensive) market research to establish what that market will be willing to pay for your product. Furthermore, when you use algorithms, you can input your time-to-market, the price of your product, and the locations in which you'll be launching and predict what sales and revenue you will generate."*

This will enable you to prove to stakeholders that your project is financially worthwhile—and get them as excited about your project as you are. Predictive algorithms can examine all variables and identify the best way forward. But their real beauty is in the ability to continually expand their remit. So, you can eventually reach the stage of being able to make informed, reliable decisions about the viability of your projects using real-time data that just gets better as you input more information.

PRIORITIZE, PAUSE, OR KILL: PREDICTING YOUR PROJECT TRAJECTORY

Consider this real-world example from McKinsey. A company ran predictive algorithms and identified it was going to miss its delivery schedule for a big customer by 50 weeks. This would mean they would miss a market window that would equate to a $350 million loss in sales. Knowing this, the company reduced the complexity of the product design so that they then delivered it on time.

Now, imagine combining this kind of foresight with the capabilities of a project management platform, one that enables you to track metrics across your entire PMO portfolio. This would mean that you could assess your capacity to see if you're going to meet project deadlines crucial to your organizational goals. Then you could use predictive algorithms to identify the best methods to complete these projects without sacrificing time efficiencies, so you have more chance of strategic success.

Most tools' insights don't extend beyond the present. Crucially, most is not all.