



How pharma can accelerate business impact from advanced analytics

Lucia Darino, Adam Knepp, Nicholas Mills, and Dan Tinkoff

Savvy pharma companies follow these five principles to scale analytics and improve their bottom line.

Once upon a time, a biopharmaceutical company launched an ambitious technology innovation program. It invested \$150 million in data, advanced analytics, infrastructure, and people, hiring data scientists and experts in machine learning and natural-language processing. The organization believed these investments positioned it to leverage an explosion of data to accelerate its operations, tailor its therapies, and enhance patient care. Two years later, the company's executive committee conducted a review of the program. The conclusion: its impact—and ROI—were unclear.

Stories like this are all too common in pharma and in other industries. Many C-suiters and senior technology executives see a troubling disconnect between the money and energy spent on analytics and its business impact (see Exhibit 1), with organizations often seeing limited value unlocked from just a handful of analytics use cases. Some pharma executives point to structural

Exhibit 1

Most pharma companies have yet to bridge the gap from experimentation to scale

Many pharmacos already have ...

- Made significant investments (as much as \$300-\$400M) in people, platforms, projects, and data
- Large portfolios of analytics experiments
- Established some kind of analytics center of excellence
- Developed new (and valuable) analytics models in isolation
- Appointed enterprise-wide leaders of analytics
- Started to transform the IT core

To scale, pharmacos must now ...

- Manage their total portfolio of investments
- Understand the relative value of each project at a granular level
- Marshal institutional knowledge to capture benefits of scale
- Train business partners to apply them to core processes
- Make them peers of business leaders to drive adoption
- Remove legacy systems and thinking to unleash innovation

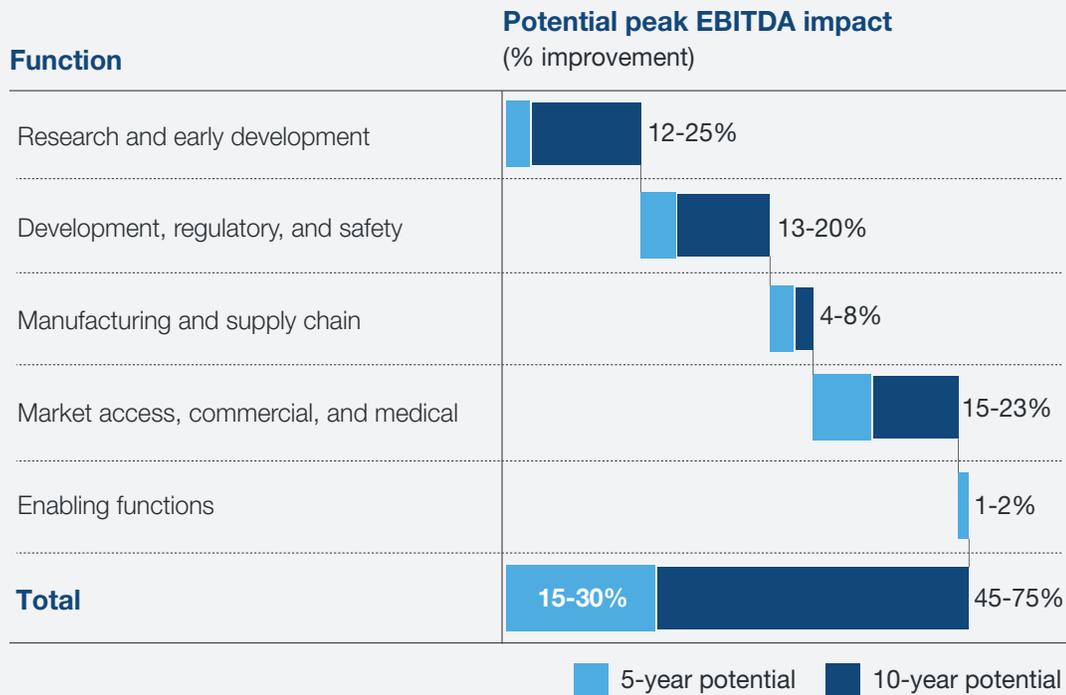
challenges, such as long development timelines, as a source of the problem. Others cite regulations around privacy and the rules of engagement with customers. But other industries facing similar barriers seem to cross the chasm between experimentation and analytics impact at scale. Just look at the success of financial services.

The keys to achieving impact through scale

Without a doubt, leveraging advanced analytics presents a real and significant opportunity for the pharmaceutical industry. Estimates of operating efficiencies attainable from scaling the impact of advanced analytics range as high as 15 to 30 percent of EBITDA over five years, accelerating to 45 to 70 percent over a decade given the potential impact of predictive modeling in discovering and optimizing new blockbuster therapies (see Exhibit 2). In increasingly cost-constrained global healthcare markets, pharmacos that leverage analytics for advanced data-

Exhibit 2

Advanced analytics could improve EBITDA for pharmaceutical companies by 45%–75%



Source: McKinsey analysis of potential based on blinded client information

driven decision making over the next one to three years will gain a decisive advantage over their peers.

Most pharma companies know this. They're way past the why. They're struggling with the how of achieving business impact through scaling. They've hired the data scientists and invested in the IT infrastructure, but they're stalled at the experimentation stage, challenged by embedding and scaling analytics organization-wide. Doing so will not be easy, and no pharma company has systematically cracked the code. However, there are exciting examples of impact across the industry (and in other industries) that offer lessons for how pharma can reach the next S-curve. We suggest five key principles companies should follow to accelerate analytics impact.

1. Choose your analytics battleground and set a bold, quantifiable aspiration.

Many pharmaceutical companies have launched successful and exciting analytics projects that generate step changes in insight on a given business question. However, these pilots often fail to scale beyond proof of concept, leaving substantial business value on the table. And without a business-back assessment of a company's highest potential value-creating opportunities and the right sponsorship from line leaders, this won't change. Even a substantial investment in analytics may go to waste if it is not driven strategically.

Companies that see significant impact from advanced analytics are purposeful about where they intend to win in analytics: they choose their battlegrounds, set bold, quantifiable aspirations for each of them, and hold senior business leaders accountable for fulfilling them. This strategic targeting can come from the top or from business-unit or functional leaders. Either way, companies should aim to develop a value-oriented perspective on where to direct analytics investments and activity (see Exhibit 3).

One global biopharmaceutical company with a complex clinical-trial portfolio successfully took this approach when it recently sought to optimize its operations by harvesting insights from its internal and external data sets. It focused first on country footprint optimization and site selection because these activities impact trial speed, cost, and quality. The company built explanatory models to identify drivers of past performance, as well as machine-learning algorithms to forecast patient recruitment and quality events. The impact was significant: enrollment times dropped by 10 to 20 percent, trial costs fell by 10 to 15 percent, and the company became five times better at site-selection processes. In this way, it directed its efforts at an opportunity with enormous business value and fundamentally transformed (and improved) the way it conducted clinical trials.

That was a battleground worth fighting for.

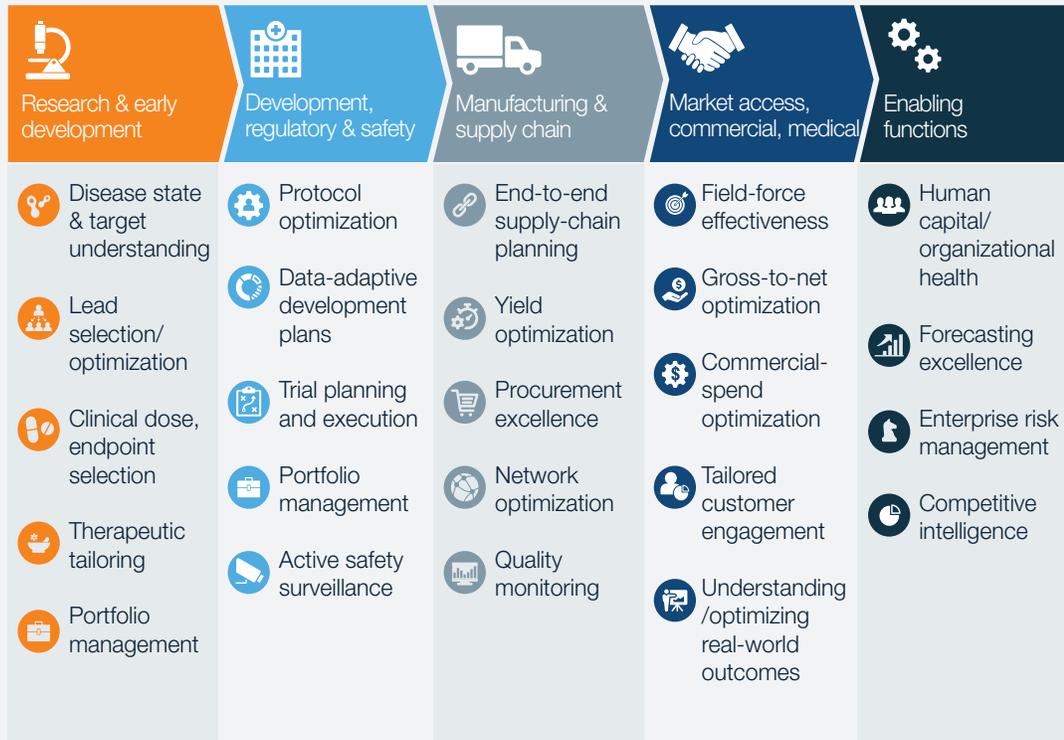
We'd emphasize that analytics, like drug discovery and development, is about experimentation—and pharmacos know all too well that some experiments fail. When choosing analytics battlegrounds and use cases, companies often overlook elements that measure likelihood of success—including technical feasibility, business sponsorship, and organizational change readiness—relative to value at stake and impact potential. Selecting use cases with a high likelihood of success first will drive more rapid scaling and build excitement and momentum in the organization.

2. Treat analytics as a new innovation capability, not a function.

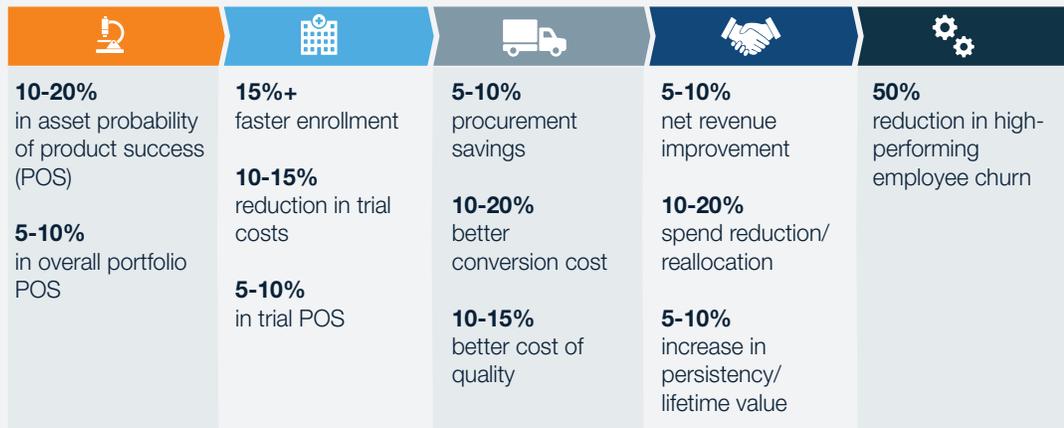
Many companies have established analytics centers of excellence (CoEs) to accelerate their journeys. These centers provide the specialized technical capabilities required to do the hard work of innovating and building new analytics solutions in conjunction with the business. However, even with the best of intentions, these CoEs often become support functions and “order takers” from the business rather than the intended hotbeds of innovation.

Exhibit 3

Pharma companies can employ advanced analytics across the entire value chain...



...to generate substantial returns



To avoid this pitfall, organizations need to recognize the profound changes they must make to the entire incumbent operating model. For many nondigital natives, this typically means:

- Pivoting from siloed analytics, business, and IT functions to interdisciplinary use-case teams.
- Moving away from traditional one-off analytics projects run at the speed of legacy business processes—in which it could take months simply to pull together a data set—to agile use-case sprints with lightweight, streamlined governance.
- Including change management in analytics initiatives to embed data-driven decision making into the organizational DNA (e.g., by democratizing model insights, enabling real-time reporting, etc.).
- Perhaps most importantly, having the organizational courage and conviction in data-driven decision making to challenge preconceived ideas and the years-old (or decades-old) rules of thumb that bias business decisions.

CoEs can help facilitate such change by, for example, developing and sharing across the organization a common set of standards and practices around data, tools and technology, and talent. These may include (but are not limited to):

- Establishing data quality standards, principles, and policies.
- Creating profiles and career-development models for analytics roles across the organization in collaboration with HR.
- Developing and maintaining a central stable of analytics tools, techniques, and model/code libraries for use across the organization.
- Establishing methodologies for running agile use-case sprints with the business.

For example, one large pharmaceutical company wanted to drive a step change in its ability to leverage and integrate data across the company. Building on its success in curating real-world data, it established a cross-functional data council chaired by the head of data science, consisting of identified owners of real-world, clinical, supply-chain, commercial, and corporate (e.g., financial) data. The council aligns the company's data strategy with priority analytics domains, defines standards (metadata models), coordinates external data partnerships, and works with IT on the optimal and relevant data architecture. The council supports data stewards in the business to identify and unleash the full potential of internal and external data, but—importantly—does not attempt to drive individual use-case prioritization or innovation.

Beyond setting standards and spreading innovative practices, it is equally important for a successful CoE to drive collaboration across different parts of the company, bringing together the IT function, data governance, and business problems that can be solved through data analytics.

If your analytics organization is spending the vast majority of its time crunching models and data, it may be time to rethink. Successful CoEs serve as agile backbones for a new innovation capability, equipping business units and functions with the right skills to interrogate data and model insights in real time to drive measurable business value.

3. Recognize that analytics takes a village—and then mobilize one.

Analytics-driven companies know they need a company-wide strategy for partnering on analytics (i.e., what to develop, what to buy, when to partner, or how to segment the nature of outsourceable work between design and execution tasks). Without one, they may struggle to manage their external partners well. They either won't have corporate MSAs or won't be able to track their spending with partners who may be working with several business units simultaneously.

Effective organizations coordinate strategic alliances that are in line with overall analytics business objectives and manage partnerships to maximize the value of collaborations to internal stakeholders.

One pharma company has managed to do this well by forming a strategic partnership group that liaises with all the business units to establish a clear view of partnerships across the organization and thereby negotiate appropriate contracts. This has enabled it to create an ecosystem of critical players—analytics providers, data providers, academic organizations, and biotechs—that allows it to interface directly on behalf of the company. Key components of this program include:

- Therapeutic-area special investment fund for the group that enables it to run pilot experiments in a much more flexible and agile way than any single unit
- A mechanism for scouting for new partnerships, new technologies, and new ideas/trends that creates an engine for continuous experimentation
- Dedicated leadership and oversight enabling more agile and faster cycle times for experimentation, as well as feedback on what is and isn't working or generating valuable insights
- A broad view of all the experiments in process across the company to spot potential synergies and pockets of value

Partnerships should always be use-case driven to ensure that investment is directed to priority battlegrounds, and top-down management and coordination can prevent duplicative investment and promote more effective strategic partnerships. Without business-leadership buy-in and the willingness of the front-line organization to adopt, analytics efforts inevitably stall. That's why companies should attempt to identify where in their organizations they already have or can cultivate analytics change agents.

4. When you don't speak the same language, get a translator.

Many companies have not yet progressed from bolting on analytics to embedding it in the strategies, structures, and processes at the heart of their businesses.

To do this, companies need skilled translators—business leaders who are well versed in analytics and have industry-specific knowledge—to articulate the business challenge to data scientists and then convey the data scientists' insights back to process owners so that they can act on them. The presence or absence of these translators, backed by process, organization, and technology, can make or break an otherwise successful use case. The translators make the data-insight-action loop work and inculcate that process and habit of thought and action throughout the organization at every level. They also serve as change agents across the organization, pushing the envelope on what is possible. High-end analytics in the pharmaceutical industry requires both medical and scientific knowledge and statistical and mathematical skills. Without an effective bridge between these analytics domains and a company's front-line professionals, companies are at risk of suffering significant value leakage over the last mile.

Analytics leaders in other industries are driving comprehensive training programs to create a community of analytics power users (especially translators) across companies (see Exhibit 4). These programs often set a goal of having 10 percent of professionals in each business unit be analytics literate. To that end, companies train teams on agile techniques via real models and data. These programs also standardize certification levels, enabling HR to define analytics-related career paths within the company. We believe there is a significant opportunity in the pharmaceutical industry to raise the analytics literacy of the business and thereby turn insight into impact, at scale.

5. Look (for the ROI) before you leap into tech investments.

Too many companies rush to transform their technical foundation, build a data lake, or launch projects before proving the value of analytics. Instead, companies should manage their initial portfolio of analytics initiatives with clear KPIs and quarterly milestones. Experiments that are not working should be cut, and those that are should get the resources to scale and be celebrated across the organization. Once the first wave of experiments demonstrates a return, then companies can think about the next wave. These lighthouse use cases should inform future investments.

Exhibit 4

A holistic analytics training program is a key enabler of the transformation, allowing rapid capability building

An analytics training program helps across five dimensions

Consistency and standards

- **Applying a consistent analytics language across the business** (eg, mathematical modeling, logical architecture)
- **Ensuring standards are being developed** by serving as a medium that the CIO / CDO can leverage

Community

- **Creating a community of analytics users** (especially translators) around the center of excellence

Training

- **Training teams on agile ways of working** (ie, tools, platforms) using best-in-class training programs (ie, field and forum approach to teach via interaction with real models and data)

Career progression

- **Providing standardized levels for certifications** enabling collaboration with HR to define analytics-related career progression within the company

External collaboration

- **Enabling collaboration** with leading universities and advanced analytics start-ups

For example, one pharma company, instead of building out capabilities from scratch hoping to retrieve an undefined value, chose to leverage its existing structures and processes to advance its analytics capabilities. The scale-up started locally and modestly, with a few functions

doing a lot of advanced statistics. Under a new chief analytics officer, the experiments kept growing and expanding into different functions, until they touched nearly the entire company. In this way, the company avoided a lot of unnecessary infrastructure investment.

Companies rarely know precisely what technology and data they will need at the outset of their analytics journey. Sometimes, a company may undertake a long, painstaking effort to clean and link hundreds of data sets to find that only a handful were necessary or relevant to its business needs and strategy goals. A more measured approach can avoid white-elephant IT investments because companies can evaluate each wave of use cases, defining what data, technology, and partnerships will be needed for success.



With significant value at stake for the pharmaceutical industry—as well as benefits for patients—the time to scale analytics is now. Most companies know that and have made a good start. The next step will be to accelerate, scale, and capture real value. Biopharma management teams are currently assessing where their organizations are in their analytics journey, determining what will be their company’s unique recipe for achieving scale, and deciding whether it’s worthy of further investment.

Those leaders shouldn’t ponder too long. There will be a significant first-mover advantage for those who pivot from experimentation to scaling and embrace the organizational changes required to do so. Orchestrating a top-team dialog on how well the company is performing against these five principles is a great way to start.

Lucia Darino is a senior expert in McKinsey’s New York office, and **Adam Knepp** is a consultant in our New Jersey office, where **Nicholas Mills** and **Dan Tinkoff** are partners.

Copyright © 2017 McKinsey & Company. All rights reserved.