Data Transformation for Limitless Insights

Data analytic ecosystems are centralizing quickly, and that's a good thing

JODY FISHER, VP and GM of Information Transformation, IQVIA

The pharmaceutical industry stands at a critical inflection point. With the march away from traditional retail markets and the desire to come as close as possible to reflecting all patient activities, the stakes for executing a data-driven strategy have never been higher. Every patient can represent hundreds of millions, or even billions, of dollars in lifetime value.

Market dynamics and evolving business complexities are driving significant disruption and transformation

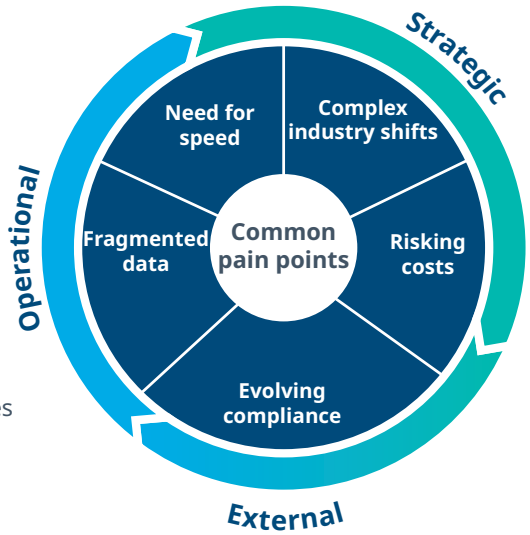
Data democratization
Data required to be accessible and actionable to inform stakeholder strategies

Compressed launch windows
Shorter windows for success requires agile strategies and real-time measurement

Disconnected data
Poor business decisions and missed KPIs are the result of incomplete and disconnected data

Inefficiencies
Diverse data sources require manual reconciliation processes and redundant technologies

Evolving privacy needs
Inconsistent and complex regulations present high stake challenges



Personalized medicine
Requires diverse and disparate data, encompassing wide range of stakeholders

Challenging payer landscape
Increasing pressures demand more sophisticated analytics

AI/Agentic AI, LLMs
New era of analytic complexity requires new skills and resources

Digital engagement
Digital transformations require new investments in technology and data

Diminishing returns
Increased margin pressures reduce gross-to-net

Under-resourcing
Lost time, missed opportunities and hidden costs result from under-resourced systems and teams

Organizations are striving to deliver improvements to commercialization, accelerate new go-to-market models, enhance brand access and awareness, engage customers with more relevance, and gain new insights about the patient journey — with an accelerating demand for "real-time". As such, the need for robust data supply, governance, and delivery practices has never been more vital. But life sciences companies are drowning in data, making data integrity, authenticity, and reliability paramount. This ups the ante on how to intelligently design and employ the data you license and how quickly your strategy can adapt given tactical performance or dynamic market changes.

"Our commercial teams rely on patient-level insights to guide launch strategy, payer engagement, and field execution. It's no longer optional. It's foundational."

— VP of Global Commercial Strategy at a Fortune 500 pharma company

Fragmented, siloed data sources no longer deliver sufficient insights, so leaders must somehow bring those sources together. Interoperability across your customers is the new currency. Unfortunately, there's no shortcut to integrating data sources so they work for all your organization's use cases.

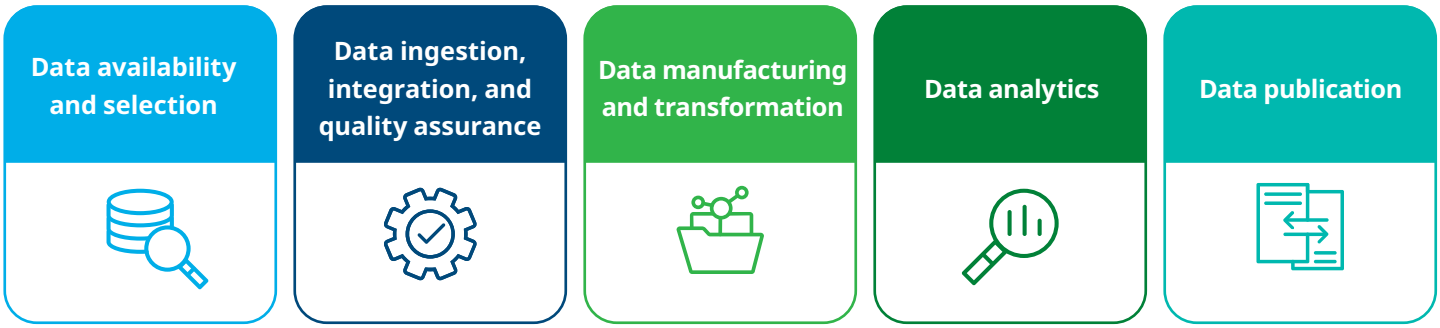
Why do you acquire data?

Businesses need data to succeed; it's common knowledge. Many leaders have sought data on this premise without stopping to form a specific data strategy with an intended ROI. When you don't have clear goals and a way to measure them, it might seem like any data will do. But when your data is going to guide real strategy and tactical change, the kind of data you get, its quality, how you calculate insights, and the publication method become very important. Ask yourself some key questions:

1. What is in the data that will help me to achieve my objectives?
2. How important is it for the data to be accurate and high-quality?
3. Where do I waste operational time if I don't know what my data says?
4. Am I confident that the data answers questions and supports strategy?
5. Can the data scale to account for new market conditions?

If you answer "I don't know" to any of these questions, you probably haven't rationalized your data ecosystem. Most companies would be better off finding a data partner who specializes in handling the complexity inherent in the pharmaceutical data ecosystem.

An end-to-end integrated data ecosystem is the foundation for advanced analytics that give you an ROI on your data investment. There are five main ecosystem components:



Data availability and selection

To build an effective analytic ecosystem, you must exhaustively consider the need for, and value of, the data that will enter the system. This is not a one-time effort and requires constant, cyclical probing. Like any manufacturing process that assures that the ingredients in the system will be quality, fit-for-purpose, and create the context for downstream processes: garbage in, garbage out. The best ingredients lead to the best outcomes. Here is how to ensure proper data collection that supports quality downstream analytics:

User feedback

Interviewing data consumers to shape data selection is crucial and should not be an afterthought. Set up a feedback loop entering the ecosystem and ultimately working from the outcomes to the beginning of the ecosystem.

Data cataloguing

This underrated step helps you understand which data provides which inputs, and grades how fit it is for the task. Factors such as data recency, field quality, sampling dynamics, and other features will help demystify the meaning of the insights. Understanding what data is available can also minimize costs and duplication.

Data stacking

No one data source or vendor has a full picture. While certain vendors like IQVIA can provide a critical mass of data, there will always be an open question about how to layer and integrate data to maximize insights and minimize gaps. You can minimize risk by understanding the keys you can rely upon to perform the integration in a stable way. IQVIA sources, like industry-leading deidentification solutions and OneKey, can support data stacking needs.

Data ingestion, integration, and quality assurance

The challenge facing pharmaceutical companies is that they possess vast amounts of valuable data but struggle to extract meaningful insights because information sits in isolated silos with different rules, formats, and access mechanisms. At the beginning of the data ecosystem, you must be able to integrate and verify the quality of fragmented data assets.

Example: Rx data. Within Rx data, there are five Ps: product, provider, pharmacy, payer, and patient. Each dimension requires curation and maintenance to ensure the data quality remains high. For example:

- Physicians could be referred to by different names.
- Patients could change their address which may impact behaviors.
- New pharmacies could start uniquely distributing a medication.
- Payers and plans may modify their practices annually.
- New products launch and inline products add forms, strengths, and even new packaging frequently.

This represents just one data asset within a pharma company's ecosystem. When organizations attempt to integrate multiple data sources — hospital claims, medical records, specialty pharmacy dispensing, direct-to-patient programs, and digital engagement data — the complexity grows exponentially.

Pharma companies often think they're saving money by buying data piecemeal from different data suppliers, but fragmented data with different rules is inefficient to integrate which leads to increased costs to operate and lower data ecosystem productivity. Before you can generate the advanced analytic models you desire, you must understand the provenance of the data, the usage rights, the limitations of various data sources, and the data's projection and forecasting capabilities. Getting clarity here, is immensely complex. The fact is, when you combine many data sources, you may increase the risk of data privacy challenges if the sources act to triangulate too much information around a single individual. An experienced, trustworthy data partner is a must to avoid such missteps.

While integration and quality control is an important focus, pharma leaders often overlook the data manufacturing and transformation processes. For decades, IQVIA has accumulated a portfolio of previously fragmented data products and capabilities and invested heavily in its core strengths of data quality, integration, manufacturing, and transformation.

Data manufacturing and transformation

Data manufacturing is the processing layer that converts raw information into analytics-ready assets. Like any manufacturing process, this requires quality control, process optimization, and the flexibility to produce different outputs from the same inputs, based on specific requirements.

For example, if you ran a bakery, you would source similar high-quality ingredients (eggs, flour, sugar, salt, baking soda, etc.) to make a wide variety of recipes. Depending on what you wanted to bake, e.g., chocolate chip cookies, a wedding cake, or a croissant, you would combine those same ingredients (more or less) in different proportions, form them into different shapes, and use different processes, to produce widely different outcomes. While the ingredients may be similar, the intended use and audience of the baked good can be very different — and any strong baking process can adapt.

When it comes to data manufacturing, IQVIA's expertise is in sourcing the right data "ingredients," making sure they're high quality, following the right "recipe" to get the outcome you want, and is invested in serving the right use case to the right audience at the right time.

Data transformation represents the crucial bridge between raw information and actionable intelligence. Continuing the bakery analogy, transformation is the chemistry that happens in the oven. It is the prerequisite for building advanced analytic models and generating actionable insights. With new "recipes" like AI-driven models in demand, seamless data transformation becomes the essential key to ensuring poor results don't ruin your ROI.

Data analytics

Data transformation feeds into model building, enabling the creation of analytics-ready datasets. Analytics-ready data lets companies define and measure what they need to, as quickly as possible. But the data needs to be ready not just for one model, but for many variations of models: descriptive and predictive. The models then generate new data sets for further analysis and publication, creating a virtuous cycle of increasingly refined intelligence. The strongest analytic ecosystems don't build for the present need; they build for the multitude of "what-if's" that the initial analytics generate. You can't be waiting days for the next response.

Here's how you might use a descriptive analytic model: consider something as simple as identifying new patients on a medication. There are actual new patients, but also refill patients who get a new prescription written every few months. Their prescriptions are new, but the patients aren't new. You need to measure these two groups in a meaningful way. Also, depending on the medication, you need to determine how far back in time to differentiate new from repeat patients.

Classifying and understanding patients in various important ways has become ordinary practice within healthcare. Performing these classifications quickly and accurately makes them exponentially more valuable. The challenge you might face is how to build the model definitions to satisfy different groups. A marketer may have an interest in looking for new patients based on a search from the last 12 months, while an epidemiologist may want more history to find "new patients." Neither person is looking at the data "wrong," but waiting weeks or months to reassess your data because of limitations in your data ecosystem may kill the opportunity. The

Case Study

One pharma company needed to redesign its distribution model to bypass payers and sell directly to patients. This redesign precipitated new data integration needs. IQVIA helped this customer onboard new data suppliers, integrate them into the ecosystem, create analytics-ready data, build new advanced analytic models, and align with both internal and external reporting requirements so the customer could measure what it needed to.

ecosystem can step in at this stage and help to engineer classifications flexibly for multiple users, to efficiently address all group needs.

Leaders will be most likely to succeed when they get analytics advice from an experienced vendor who can build analytic models that scale to and address a multitude of parameters and offer several options for publication, making their data analytically ready and fit for purpose for multiple users — not simply reliant on single sets of static assumptions.

Data publication

Most pharma companies today want to interrogate their data with machine learning and AI tools. You may have already made significant investments into one (or more) tools, and diverse stakeholders prefer different ways of accessing insights. Some prefer cloud-based platforms like Snowflake or Databricks. Others rely on visualization tools like Tableau or Power BI. Still others need flat files for legacy systems or custom analytics platforms.

> *"Our ambition is to become powered by artificial intelligence at scale, giving our people tools and technologies that focus on insights and allow them to make better everyday decisions."*
>
> *— CEO at a Fortune 500 pharma company*

Because there's not just one preferred tool for publishing analytic outputs in the pharma industry, your data partner must be platform-agnostic and never insist that you can only publish in their tool. Forcing organizations to adopt specific publication formats creates friction, reduces adoption, and ultimately limits the value of even the highest-quality data.

Choosing the right data partner

When you're researching data partners for an ambitious data ecosystem, sustainability should be your utmost consideration. A bespoke solution of multiple vendors might be attractive because it saves on costs in the short-term and solves a set of immediate problems, but it will end up costing you in the long run. This data ecosystem is going to serve your business five, 10, 15 or more years into the future.

CHALLENGES TO CENTRALIZING INFORMATION NEEDS IN ONE ECOSYSTEM

Governance overload
Managing risk, compliance, and technology across ecosystems

Need for insights
Teams need real-time, trustworthy insights or risk being outpaced

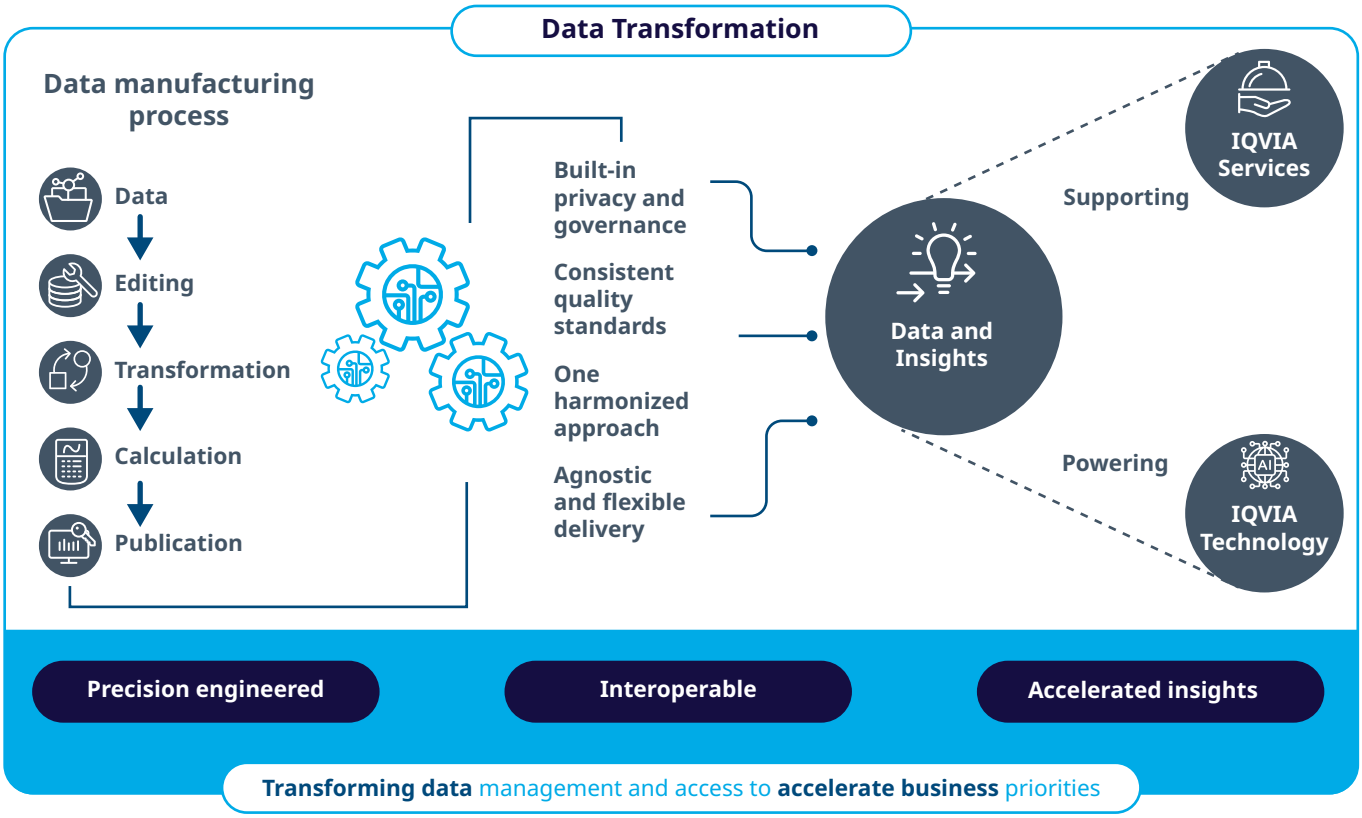
Integration fatigue
Excessive vendor reliance leads to rising costs and complexity

Resource constraints
Teams overstretched, chasing data hygiene across portfolio

Innovation paralysis
Systems designed for old priorities limit commercial agility

The most efficient and cost-effective way to build your ecosystem is with one vendor, specialized in the healthcare industry, who can support you from data ingestion and integration, to manufacturing, to analytics, to publication.

Just as your brownies will be flat and dense if you leave out the baking soda, or liquid if you leave out the flour, all the data you collect will fail to meaningfully support your use cases if you're missing any one piece of the ecosystem. Some vendors can successfully manage one element or two individually, but a vendor who can handle the whole data ecosystem delivers value and ROI that's greater than the sum of its parts.



IQVIA provides the integrated, foundational data, the technology to accurately and consistently report on the data, and the consulting services to help you most effectively use the data. We also support infinite analytic model variations and flexible publication methods. Whether you prefer fully managed services where data arrives ready for immediate use or want a private-label ecosystem you can customize and control internally, IQVIA offers the superior solution tailored to the pharma industry's evolving needs.

You don't have to do it alone. IQVIA's ecosystem brings the clarity and the confidence you need to make critical decisions.

Centralize your data ecosystem and finally get an ROI on your data.

IQVIA

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