

Unlocking the Value of Data and Workflow Automation in the Lab

This report offers an update on the power of solid data analytics strategy and automated workflow solutions as scientists aim to break down the barriers to the 'lab of the future'



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- > Where ROI of lab software can be evidenced and how to demonstrate value via data
- > Why managing changes in the lab environment can benefit efficiency and provide results

Unlocking the true value of data

Scientists within the pharmaceutical research space are finding that they must contend with a new wave of data challenges, as new therapeutic fields develop and innovative technologies and methodologies evolve. The data with which these scientists must work is becoming ever more complex and drawn from an increasing variety of sources.

The challenge for the pharma industry now lies in how to manage vast amounts of data to unlock its true value and realize the vision of a seamless, integrated, automated research lab, otherwise known as the 'lab of the future'.

Paula de Matos, Consultant of UX for Life Sciences at the Pistoia Alliance, argues that to truly gain value from data resources and increase research productivity "scientists must find the right tools to help them easily understand, dissect and analyze the vast reams of data they are working with".

Charles Fracchia, CEO of BioBright and VP of Data at Dotmatics, agrees, noting: "By combining artificial intelligence (AI) and automatic collection of data at scale, pharma companies are able to accelerate their decision making processes and ensure that is based on the highest quality of information."

At a macro level, achieving a 'lab of the future' environment is linked to having a data-driven culture. Any successful business model around data begins with setting a universal ambition for the value it expects to create.

Rob Brown, VP of Product Marketing at Dotmatics, says: "Widespread adoption of cohesive data processes will help scientists, analysts and pharma stakeholders alike understand how to enhance the quality and utility of their data, facilitating process flexibility and achieving greater efficiency and scalability. Without this ability, it is nearly impossible for any function or business enterprise to be truly data-driven."

While the benefits of an intelligent lab system has the potential to democratize access to data, maintain integrity through limited human intervention, improve lab workflows

to ensure efficient operations and ease the burden when managing the scope of new experiments, many pharma companies continue to struggle to design a data transformation model that delivers value right from the start.

In this report, Pharma IQ – in collaboration with Dotmatics – addresses three primary challenges limiting the data transformation process within pharma: system integration, securing return on investment (ROI) and change management strategy.

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Charles Fracchia

CEO of BioBright and VP of Data at Dotmatics



Meeting challenges of system integration

When historic, legacy systems were initially implemented, pharma organizations had no way of predicting the advanced technological needs of the scientists of today, making the integration of new systems and technologies even more difficult. This has been compounded by the rapidly accelerating pace of innovation in data processing and lab technology.

Traditionally, many labs would act independently of the overall pharma organization, implementing new technologies and systems on an ad hoc basis. This piecemeal investment in lab technology was not carried out with an overall plan for the future integrations, making the upgrade and replacement of current tools an extremely complicated task, with valuable data locked away in various, disconnected lab systems. Scientists require the ability to seamlessly transition between the systems they work with and to maintain full visibility over experimental and analytical data in order to create effective digital workflows.

Dan Ormsby, Senior Consultant at Dotmatics explains: "large pharma companies already have a data landscape in place. Scientists have existing tools they are already

efficient in using, so incorporating new business continuity drivers or new data systems can be a challenge."

"For pharma companies to build on their data transformation success it is about finding where the new data systems can add value, and then how we can start building a next-generation data journey that causes minimum disruption," Ormsby says.

Pharma companies are also dealing with large volumes of historical data. Ensuring the value of the historical data is not lost and combining it with new project data is important for keeping scientists informed and ensuring accurate decisions are made to avoid re-work.

Dotmatics' Brown believes that pharma organizations must look to achieve new heights in process automation and enable seamless end-to-end analysis across the business. To achieve this, he stresses the importance of the introduction of a lab data automation platform that is then fully integrated with the scientific informatics solution, believing this to be the solution to the problem of historical data integration.



A solution from BioBright and Dotmatics

With the exponent curve of data continuing to rise and instrument manufacturers coming up with exquisitely more complex and data rich outputs, Dotmatics and BioBright saw this as an opportunity to capture information to enhance scientific analysis.

BioBright's Fracchia says: "At a big pharma company you are dealing with at least 10,000 different instruments and petabytes of information. Our system integration tools will allow you to throw out what is irrelevant, sooner and faster, and allows you to reduce your data storage costs. More importantly, the biggest benefit is it allows companies to avoid having their most precious resource (the scientist) wasted on the wrong context."

By doing the data analysis as early as possible using an automation quality assurance and quality control process, pharma companies will be saving millions of dollars annually on "opportunity cost," Fracchia explains.

"Having an open, reproducible, API interface enables this AI-driven world. BioBright has a full specified API, so that customers can use all of the data packages and automate processes that would have otherwise been done by hand," Fracchia comments. "Our integration tools simplify the interface to the data, so a customer can buy any instrument they want and plug in our tool on top of it to make the data accessible in a neutral, open format."

The need to evidence ROI for software and technology investments has always been a challenge for pharma organizations. With these organizations already owning significant amounts of legacy software, the challenge of encouraging and proving ROI for new investments becomes much more difficult.

Further investment in lab software and technology is necessary, however, if organizations are to truly achieve a 'lab of the future'. This, as with all other investments, will need to be justified to key stakeholders. One of the primary benefits of new software investment, the limiting of human intervention in data processing, has often been considered intangible, thereby complicating the task of evidencing ROI. With increasing importance being placed on data integrity by regulatory authorities, this has become a key investment factor alongside the importance of saving valuable research time.

Saving research time can be achieved by driving innovation and efficiencies in the lab. According to Haydn Boehm, Head of Commercial Marketing, Digital Lab Productivity Solutions at Merck Group, the preparation of data for secondary use is an area where significant efficiencies can be gained. In his session at [Pharma IQ Live: SmartLab Digital](#), Boehm explains that the current

pain points involved with data preparation represent a massive cost for the life sciences industry.

"This cost can come down to the time spent capturing the data, processing and enriching it for secondary use, integrating it into other systems and analyzing it to understand what it means," Boehm explains.

Boehm notes that when data is being captured manually, not only does it necessitate a significant amount of human involvement but also means that data collected is void of any metadata which can offer visibility over the functioning of lab processes. This prevents pharma organizations from effectively identifying and eliminating any inefficiencies that exist in the lab, making it more difficult to attain enhanced ROI.

According to Boehm, one of the strongest tools that pharma organizations can employ in attempts to limit the inefficiencies of manual lab processes is the implementation of automation technologies, so that these tasks can be completed automatically with minimal human intervention. In doing this, pharma organizations can free up the time of lab technicians and scientists so that they can work on more challenging and value-adding tasks.



A solution from BioBright and Dotmatics

Many industry professionals will likely already have heard of the efficiencies that can be gained through automation in the lab and the enhanced ROI that this can garner, but may not be aware of how effective this can be in reality.

Biobright's Fracchia offers an example of the power of automation, citing an automation initiative applied by Biobright and Dotmatics for a large pharma company. Fracchia explains that previously the scientists were manually transferring data from the experimentation stage to analysis, and then waiting between 12 and 18 hours for the results of that analysis, with the overall process taking up two-to-three days for the scientists. If the experiment was unsuccessful they would have to repeat this process.

"So what we did is automate the data collection, but also automated QA and QC of this data," Fracchia remarks. "So all they have to do is set up the instrument and run their data collection, then the software automatically collects that data at 3am, for example, and kicks off the QA QC process automatically. By the time they return the next morning their results are already on the dashboard, and this saves scientists around one-to-two days per week."

Such a dramatic saving of time evidences the effectiveness of automation in the lab and the enhanced efficiency is a crucial win for the ROI of any pharma organization.

While successfully implementing new technologies and practices in the lab will naturally bring some technological and strategic challenges, one of the greatest barriers to overcome is fostering a culture of change.

When pharma organizations implement new technologies or methodologies in the lab, they not only have to overhaul or replace legacy systems, but also have to change the mind-set of employees and drive a culture of change in the business. According to Dotmatics' Ormsby, this should be a gradual process.

"You're not just going to throw everything away the day you arrive," Ormsby explains. "There is an existing set of tools that people are familiar with. Scientists are efficient in tools that they know and it will take them a while to realize how much more efficient they could be by doing something new."

Managing change in the lab does not just refer to the integration of new technologies or systems, as we have seen recently with the disruption caused by the Covid-19 pandemic and the remote working mandates that accompanied it.

Biobright's Fracchia believes that organizational agility is the key to managing change in the lab, organizations that can move quickly to implement new solutions or adapt to new ways of working stand a much better chance of being successful in the integration of new technologies and reaping their rewards.

"[Organizational change] adds to the need for agility and we've seen that agility has become a new metric, particularly in pharma," Fracchia notes. "Pharma organizations have to manage tasks like integration and collecting data from diverse sources to still make it accessible despite a fast-moving environment, and I think companies are realizing that they need to optimize for that."



A solution from BioBright and Dotmatics

Driving organizational agility can be a challenge for any pharma organization, particularly larger businesses with complex historic processes that are engrained into the way of working or legacy systems that complicate the management of data. Fracchia advises that pharma organizations can counter this through the implementation of automated workflow and data management platforms, which are inherently geared toward organizational agility and designed to work well with other internal systems.

"When these solutions are utilized well, it is easy to see how small groups can outcompete large groups because they are more nimble and agile," remarks Ormsby.

As an example of the power of organizational agility and the consequences of failing to achieve it, Fracchia points to an example that occurred during the Covid-19 pandemic. At the outset of the pandemic, several pharma organizations were naturally looking into the

development of a viable vaccine, including a large company known for its ability in vaccine production. It was not this company that would eventually be successful. It was BioNTech, a small German company partnered with Pfizer, and Moderna who ended up bringing viable vaccines to market.

"What do these companies have in common? They are nimble and they are adopting these new technologies much faster," Fracchia explains. "So the larger, more established company lost by a landslide, to the point that they were not able to produce a viable vaccine."

This is further evidence of the advantages that organizational agility can offer as smaller businesses compete with pharmaceutical giants. By adopting workflow automation and data management platforms, these organizations can achieve the same level of agility as they take on the pharma giants.

Conclusion

Data may have been heralded as the 'new oil' for some years, but it is evident that the true value of data is now recognized on a global scale. The implementation and integration of solid data management practices and technologies is fraught with challenges however, including the obstacles organizations face when attempting to manage system integration, secure ROI or drive a culture of change.

These challenges are not without viable solutions, however, as automated workflow and data management platforms allow organizations to take control over their data. From here, they can attain new levels of visibility and agility while saving scientists up to one-to-two days per week of their valuable time

and accelerating the process of experimentation and analysis. These time savings and improved pace of research will prove essential for those businesses looking to gain ROI, as their research and development occurs faster and more efficiently, heightening the chances of successful development of profitable medicines.

Organizations that successfully leverage automated workflow platforms have an opportunity to advance their ability to compete with much larger opposition in this current age of data where agility is the key to success, as evidenced in the example discussed earlier in this report. Those who fail to see the value of this agility will likely find themselves left behind.

"For pharma companies to build on their data transformation success it is about finding where the new data systems can add value, and then how we can start building a next-generation data journey that causes minimum disruption."

Dan Ormsby

Senior Consultant at Dotmatics



About Dotmatics

Dotmatics is a scientific informatics software and services company that is driving the automation of laboratory workflows for discovery and innovation research, accelerating the journey towards full digitalization and the lab of the future.

In April 2021, Dotmatics was acquired by Insightful Science and combined, the two now form the world's largest, cloud-based scientific R&D platform.

With a mission to give scientists access to all of their data, all of the time, Dotmatics provides a unique portfolio of tools for fully automated, end-to-end workflows including data acquisition, knowledge management, data storage, enterprise querying and reporting, and data analytics and visualization. Through these comprehensive solutions, the company is helping its customers to increase lab efficiency and make better informed decisions driven by data.

Dotmatics' customers include many of the world's leading pharmaceutical, biotechnology, contract research, chemicals and materials companies. Insight into the challenges faced by these organizations enables Dotmatics to focus on delivering versatile and intuitive products and services that have potential to turn around the productivity deficit in research and accelerate development of novel drug candidates or products.

Dotmatics was founded in 2005 by two scientists from Merck Pharmaceuticals (MSD). Since then, it has built a strong and profitable business and in 2020 acquired BioBright, a Boston-based company automating secure data collection and analysis from laboratory and biomanufacturing environments.

Dotmatics

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