Advanced Data Management Spurs Faster Innovation in Oil and Gas

What to expect

This white paper explains how data capture and analytics solutions by PerkinElmer Informatics can advance innovation in the development of petroleum and petroleum-alternative products—reducing risk and getting you to market faster.

- Discover how to increase efficiencies by recording experiments in a common digital platform.

- See how you can implement leading data management techniques that structure data for analysis in real time.

- Learn how to transform good data into great insights with smart analytics.

This information is of interest to a diverse range of R&D organizations involved in petroleum-related operations, including exploration, storage, transportation, refinement, and more, where it is common to manage huge amounts of data with minimal tolerance for error.

A faster, more reliable pipeline to market readiness

When you are developing new formulations, or modifying existing ones, for novel lubricants or cleaner fuels, you need access to the right data without delay. You must efficiently conduct tests and analyze results, as well as optimize your synthesis or formulation process, to increase yield, decrease cost, and minimize time to market.

PerkinElmer Informatics has solutions for data capture and analysis that accelerate R&D innovation, so your finished products in the oil and gas sector reach the market in record time—and with maximum ROI.

As you work to develop innovative approaches to reduce emissions, maximize efficiency, and make similar breakthroughs that will give your company and customers a competitive edge, you must overcome five common challenges:

- Speed to market. It's essential to move fast to beat your competition in the race to market. Coming in second is not an option.
- Process improvement. Speed must be balanced by attention to quality and smart risk management, ensuring the resulting products perform precisely as planned.
- Cost of materials. Cost and availability of materials must be factored in when selecting the best formulation to keep the research pipeline flowing.

- Unmet market needs. Advanced solutions have to address emerging market needs to ensure customer adoption and ultimate satisfaction.
- Intellectual property protection. A thorough review of the legal landscape is necessary to avoid future patent issues—and to protect your own IP.

High-performance data management for innovative lubricants and fuels

Making commercially viable products is time-consuming if the way you handle data has not kept pace with the evolving demands of your business and marketplace. PerkinElmer Informatics has found that 80% of data – even digital – becomes untraceable, often because it's stored on individual computers, and that not creating digital records of data accounts for 17% of data loss that delays or sets back research.

Below are common challenges that advanced data management solutions can help overcome:
- It takes too long to discover novel ingredients and develop or modify formulations to suit new applications.
- Failure to process a single sample correctly could result in a stranded investment or compliance penalties.
- The sheer volume of formulations and ingredients makes search and retrieval of data time- and labor-intensive.
- Work is delayed because scientists don't know what materials are available in-house and in sufficient quantities, what needs to be ordered, and what it all should cost.
- It's difficult to determine if ingredients and formulations meet specified test criteria.
- There's nothing in place to keep track of samples and related results effectively, such as linking sample names and other metadata to avoid errors.
- Inefficient management of people, samples, instruments, and other resources is interfering with timely and high-quality testing.

- It's hard to get a holistic view across all stakeholders to enable collaboration,

easily track progress across all programs, and drill down into a subset of results for further analysis and informed inquiry.

PerkinElmer Informatics solutions provide a complete, consistent, and collaborative environment that meets the scientific and technical needs of your organization and team—a solution that will speed up data capture, data processing, decision making, and material tracking, as well as overall data analytics, to give you greater maneuverability when responding to ever-changing market demands.

Better data drives better decisions, accelerating oil and gas innovation

Are you developing a new catalyst for a game-changing biofuel? Formulating novel lubricants for more efficient engines? Innovating low-carbon production of traditional energy products? We understand the obstacles you face in your race to market. You need to ensure you're investing in the right formulations, collaborating effectively, and making the best decisions in the shortest amount of time with:
- A complete, consistent, and collaborative environment that meets the scientific and technical needs of your organization and users.
- Faster data capture, data processing, decision making, and material tracking.
- Significant reduction in non-value-add manual activities.

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- Data analytics that enable greater flexibility to respond to market demands.
- Access to audit trails and other information related to security regulations for proof your systems and data are secure and compliant.
- Easy monitoring of who has accessed your systems, to protect your IP.
- Improved business continuity, with efficient knowledge transfer in the event of job moves and attrition.

In fact, PerkinElmer Informatics solutions have delivered 20-30% time-savings, 15% cost reduction per user, 25% improvement in IP protection, and a fourfold increase in response time to regulatory questions and findings for a leading sustainable manufacturer of carbon black additives.

In addition, users at a fine & specialty chemicals company have reported deeper collaboration across multiple management and technical levels, noting the functionality, intuitiveness, and rich APIs. Users were:

- Faster able to locate data vs its previously fragmented data landscape
- Improve recording and storage of R&D experiments to create more structure data
- More easily share data across R&D to boost collaboration
- More successfully search R&D data
- Control access to data for improved security of IP and trade secrets
- Visualize data for enhanced analytics
- Leverage digitalization during the COVID-19 pandemic

Integrated solutions to keep your team at peak performance

Each of PerkinElmer Informatics' oil and gas sector solutions targets specific information roadblocks that stand between you and your marketplace. Together, they offer an end-to-end ability to capture, manage, and analyze data so you're making the best choices at every milestone.

Achieve better collaboration through Signals Notebook

Signals Notebook, a cloud-native electronic laboratory notebook (ELN), enables better collaboration between innovators, decision-makers, chemists and formulators, process and production engineers, and product testing experts, as experiments and results are easily accessible to all team members.

Signals Notebook is the only ELN that covers a comprehensive set of scientific use cases, spanning biology, chemistry, formulations, analysis, and more. It puts you in the passing lane for digital transformation through an outstanding experience. It will also enable you to improve productivity and data transparency through enhanced collaboration, improved workflows, and lab automation.

Enhanced materials management with Signals Inventory

Signals Inventory, a component of Signals Notebook, automates inventory management, enabling users to lookup, link to, and update materials used within experiments without leaving the ELN.

Importantly, users can pull containers, materials, and samples directly into the Plate feature within their experiments. Multiple barcodes, locations, and containers offer greater flexibility and inventory accuracy.

Accelerate scientific decision-making with Signals Inventa

Signals Inventa has the key capabilities researchers need to identify structure performance relationships, as well as to optimize multi-parametric optimization and scoring tools. Formerly known as Signals Lead Discovery, Signals Inventa is a next-generation data management system for analyzing scientific results. Powered by PerkinElmer's innovative Signals Data Factory technology, it enables you to quickly access and analyze all scientific results

collected throughout the research and development lifecycle.

Signals Inventa offers all the chemical and biological analytic functionality of Lead Discovery Premium, plus advanced query and data management capabilities. This means you can easily find and retrieve any test or assay result plus associated compound or biologic information across experiments, projects, and departments. Zip through sub-second query responses across even the largest of datasets. And speedily transfer only the relevant subsets of data into analytic dashboards without any manual data wrangling and reformatting.

Transform data into actionable insights with TIBCO® Spotfire®
TIBCO Spotfire allows researchers to correlate materials properties with performance. With powerful visualizations and predictive analytics, it gives you everything you need to prioritize work in the lab.
PerkinElmer is the exclusive provider of TIBCO® Spotfire® for scientific and clinical R&D applications. This enterprise-class visual analytics and discovery platform empowers your team or organization to easily mine scientific data, and gain keen insights, to fuel data-driven decisions record time.
With advanced visual analytics you can:

- Compare and contrast petroleum sourced from global regions
- Investigate additive packages
- Evaluate petroleum samples for the presence of sulfur and nitrogen
- Screen novel formulations

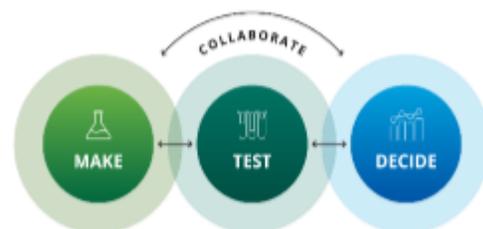**Optimize scientific communication with ChemDraw® and ChemOffice+ Cloud Standard**
With its origins as a chemical drawing tool, ChemDraw® has steadily evolved to become the leading chemically intelligent solution to help you:

- Perform quick structure searches across all documents where chemical information is stored.
- Create and manage collections of molecules and/or reactions with their associated properties.
- Rapidly create reports from ChemOffice+ Cloud Standard of your chemistry experiments within Signals Notebook.

ChemOffice+ Cloud Standard is a chemistry communication suite that transforms your chemical drawings into chemical knowledge by

facilitating the management, reporting, and presentation of your research.

With powerful capabilities to search, select, reuse, and organize chemical structures and data, chemists can use ChemOffice+ Cloud Standard to create presentation-ready PowerPoint slides and publication-grade manuscript figures with only a few clicks.

Data management solutions formulated for your specific needs

Find out for yourself how PerkinElmer Informatics solutions transform slow, inefficient R&D operations into a well-oiled innovation machine. Test drive the unique value of PerkinElmer's solutions:

- Built to deliver specific end user functionality to support Make-Test-Decide workflows.
- Integrated workflows ensure smooth collaboration.
- Best-in-class visual/advanced analytics.
- Data for analytics is automatically associated together to provide holistic insights.
- Experimental narratives are captured to protect IP and available for learning through the enterprise.

- Faster product development with fewer failures through collaboration and information sharing.
- Scalable from small operations to enterprise companies with thousands of users across multiple locations.

One international chemicals company reported that PerkinElmer Informatics solutions transformed its R&D culture with easier collaboration and results-sharing. More than 60%

of users reported the solutions were easy to use and helpful in improving daily productivity, while 66% reported improved security of R&D data.

Fire up your data and prepare for high-speed innovation

Our solutions accelerate your product development by helping you understand the relationships between components and product performance and enabling you to make insightful decisions based on predictive modeling. Powerful, highly scalable, and intelligent, our solutions leverage PerkinElmer Informatics' decades of experience in designing solutions for real-world problems.

Join leading chemical and agrochemical companies using PerkinElmer Informatics solutions to ignite their innovation. Take control of your data, and rev up the ROI for your oil and gas sector R&D.

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