DELIVERING GROWTH AND OPERATIONAL EXCELLENCE
BIOVIA SOLUTION FOR PETROLEUM REFINING
To deliver growth and operational efficiency, leading refiners need to accelerate innovation cycles to maintain continuous operation while ensuring both control and agility in product portfolio optimization. A digital molecular refinery enables research teams to better understand and design products that improve “cracking” results and increase throughput of advantaged crudes. The next-generation refinery leverages scientific information and analytics to streamline portfolio management and increase agility.

**BIOVIA SOLUTION FOR REFINING**
Dassault Systèmes BIOVIA delivers a comprehensive quality solution for enterprise excellence that supports the complex needs of fuel and additive formulation and product development while also reducing the effort required to document scientific activities with improved detail, accuracy and speed.

**POTENTIAL OPPORTUNITIES FOR REFINING COMPANIES**
Companies adopting BIOVIA’s unified innovation discovery and digital laboratory solution have realized value across a range of activities.

**BIOVIA BENCHMARK METRICS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Metric</th>
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<tbody>
<tr>
<td><strong>Cost Reduction</strong></td>
<td>↑ 60% or more in right-first-time submissions; avoid costly resubmissions</td>
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<td></td>
<td>↓ 5-15% reduction in product launch costs</td>
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<tr>
<td><strong>Global Operational Efficiency</strong></td>
<td>↓ 16% or more reduction in time-to-market</td>
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<td>↑ Global site compliance</td>
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<td>↓ Site-specific variations</td>
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<tr>
<td><strong>Business Process Optimization</strong></td>
<td>↓ 3x-10x workflow response</td>
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<td>↓ 15% reduction in laboratory testing time</td>
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THE DIGITAL MOLECULAR REFINERY

Refining organizations can improve collaboration across sites, globalize standardized best practices to increase reuse and streamline operations to accelerate time to market while capturing value from higher performing and more strategically targeted products that meet market needs.

BENEFITS OF ENTERPRISE INTEGRATED DISCOVERY AND LABORATORY STRATEGY

Designing processes that consume a high variety of crudes requires both a better understanding of crudes and the ability to develop targeted and optimized catalysts. The term “digital molecular refinery” refers to the benefits of a comprehensive innovation strategy that enables a refinery to run ever more complex chemical simulations supporting better understanding of product behavior and processes, while also enabling improved refining practices and systems. BIOVIA innovation discovery (predictive science) and unified laboratory management solutions enable multi-disciplinary global teams to collaborate in developing and optimizing refining operations to optimize “crack spread,” improve energy use and reduce plant shutdowns.

IMPROVE ENERGY UTILIZATION

BIOVIA’s unified innovation discovery and digital laboratory management solution helps refinery personnel better understand energy profiles at the molecular level so that they can create products and processes that reduce energy consumption and improve energy usage across refining operations.

OPTIMIZE PRODUCT PORTFOLIO

BIOVIA solutions have been used to map hundreds of crude profiles at the molecular level to significantly improve how products are formulated and processed. These computer simulations are also used to develop target catalysts and optimize distillate and crude blending. This simulation data can be shared with BIOVIA’s unified lab management solutions to optimize and accelerate lab operations across the value chain.

REDUCE PLANT SHUTDOWNS

Decoking and descaling are critical to minimizing plant shutdowns. The molecular refinery allows organizations to simulate chemical compound interactions under different conditions. Modeling and simulation can optimize processing solutions, reducing both planned and unplanned shutdowns and potentially saving millions of dollars in lost revenue.

BIOVIA’s digital innovation discovery and unified laboratory management solutions help refinery personnel better understand energy profiles at the molecular level.
THE CASE FOR CHANGE

With the digital molecular refinery, R&D teams can improve collaboration across sites, globalization of standardized best practices and streamline operations. By capturing value from target products with improved performance, refiners can reduce shutdowns, improve energy efficiencies and optimize catalytic cracking.

Strategic Benefits
- Improve product processing and development
- Accelerate lab turnaround times to support more efficient new product introduction
- Transform laboratory operations to support better connected and more collaborative R&D

Economic Benefits
- Accelerate knowledge transfer from retiring employees
- Increase productivity for data aggregation, analysis and reporting
- Streamline collaboration activities for improved response times

Risk Mitigation
- Standardize processes with full traceability of all laboratory activities
- Implement configuration-based, validation-ready, proven technology
- Reduce operational and compliance risk with greater visibility across operations

IT Impact
- Replace custom implementation with configuration
- Improve end-user adoption
- Simplify IT landscape with reduced IT development/maintenance costs
THE VALUE OF PARTNERING WITH BIOVIA

Now more than ever, refiners need a trusted, strategic partner that shares their vision and passion for what is possible in today’s rapidly changing environment. Dassault Systèmes BIOVIA offers unparalleled experience and a strong track record in the petroleum and chemicals industries supporting your business and IT transformation journey.

We look forward to assisting refiners with overall product development, design and deployment to accelerate the transition from evaluation to implementation of an industry-leading unified innovation discovery and digital laboratory solution.

The next step is to develop a strategic business partnership with BIOVIA aimed at deploying this BIOVIA solution to improve product performance, streamline operations and accelerate innovation to market.

Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes’ collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 190,000 customers of all sizes in all industries in more than 140 countries. For more information, visit www.3ds.com.