



The Digital Chemical Lab

*Top Performers Digitalizing
Their Chemical Laboratories*



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***This summary is an abbreviated version of the report and does not contain the full content. A link to download the full report is available on the Tech-Clarity website, www.tech-clarity.com.**

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Executive Overview

Chemical companies rely on R&D and their laboratories to innovate so they can compete in increasingly crowded, global markets. In fact, innovation emerged as the most common problem in our recent chemical industry survey, with one-half of respondents citing it as their top business challenge (Figure 1). Of course, chemical companies face a host of shared challenges that they must address, including managing costs, capturing global markets, and driving sustainability.

Chemical companies also report related, operational challenges in the lab (Figure 2) that likely contribute to their business challenges and make change difficult. These challenges include research productivity, inability to find data, difficulty with new product development, traceability, and more.

Digitalization can help address these challenges by driving innovation, agility, customer-centricity, and quality. We surveyed over 170 chemical companies to understand their intent, status, and outcomes related to digitalizing the chemical laboratory. We used the survey to analyze digital best practices to see which correlate with higher performance and help companies meet their business objectives. Our key findings include:

- Most chemical companies have started to adopt digitalization
- Digital transformation is further along in the lab than beyond the lab
- Chemical companies report varied levels of digital maturity

The leaders exhibit higher digital maturity than other companies.

We identified the industry's Top Performers, those with better revenue growth, margin expansion, innovation, and time-to-market performance, to understand their digital practices. We found that these leaders exhibit higher digital maturity than other companies, particularly in more advanced capabilities like chemical simulation and knowledge management. They also report much better operational capabilities in the lab. How do Top Performers reach these higher levels of performance? Top Performers:

- Are more digital in the chemical laboratory
- Have invested in more digital lab best practices
- Use more specialty scientific software
- Value a platform approach to integrate and support the digital enterprise

These findings help us understand what Top Performers do differently to achieve their higher levels of success. They also serve as a model for chemical companies looking to improve innovation and overcome challenges – and most importantly drive better business results. Let's take a look at what we learned.

Conclusion

Chemical companies are challenged to improve their innovation and product development performance while controlling cost. They face significant operational issues that make these business improvements hard to achieve. Digitalization holds significant promise to address these issues and improve performance because it's proven to accelerate the pace of innovation, increase agility, and improve efficiency.

Digitalization improves performance because it's proven to accelerate the pace of innovation, increase agility, and improve efficiency.

The transition to the digital chemical lab has begun. Today, however, most chemical companies have only partially digitalized. Top Performers, though, have greater digital maturity than their lesser-performing competitors. They've adopted more digital R&D and lab capabilities, particularly when you look beyond the basics to best practices.

Top Performers have implemented more specialized R&D and lab management systems to support their best practice processes. Based on the survey results, we believe that these capabilities help the Top Performers achieve better operational R&D and laboratory performance and drive better business performance. Our overall conclusion is that digital best practice processes and chemical laboratory management solutions provide a competitive advantage that helps chemical companies drive higher levels of innovation and profitable growth.

Digital best practice processes and chemical laboratory management solutions provide a competitive advantage that helps chemical companies drive higher levels of innovation and profitable growth.

Finally, we believe that digitalization will lead to significant market disruption across the chemical industries and result in a significant change in market leadership. Digital transformation supported by best practices and a platform of integrated R&D and laboratory solutions will be a key differentiator to enable the future Top Performers that will lead the industry. The time to digitally transform the chemical laboratory is now.

Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations. Chemical companies should:

- Ensure the digital chemical lab prerequisites and basics are in place
- Pursue digital laboratory best practices including reuse, simulation, and knowledge management to differentiate and drive higher levels of innovation
- Leverage specialized laboratory and R&D software to drive better business performance
- Pursue a chemical laboratory systems platform strategy to further improve performance and gain a market advantage
- Leverage digitalization processes, tools, and techniques to take advantage of the current market disruption and gain market position

About the Author

Jim Brown is the President of Tech-Clarity, an independent research and consulting firm that analyzes the business value of software technology and services. Jim has over 25 years of experience in software for the manufacturing industries. He has a broad background including roles in industry, management consulting, the software industry, and research. His experience spans enterprise solutions including PLM, ERP, quality, service, manufacturing, supply chain management, and more. He is actively focused on researching new digital enterprise initiatives and technologies including cloud computing, digitalization, smart manufacturing, AR, VR, and the IoT. Jim is passionate about improving product innovation, product development, and engineering performance through digitalization and the use of software technology.

Jim is an experienced researcher, author, and public speaker and enjoys the opportunity to speak at conferences or anywhere he can engage with people with a passion to improve business performance through digitalization and software technology.

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