From green labs to cloud-first: what's next in life sciences

**Life sciences industry forum,
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What is the role of the cloud in a highly regulated environment? Is there a low-cost, faster path to the Golden Batch? Are sustainability and cost effectiveness always linked? Leaders in the life sciences-rich San Francisco Bay Area debated many topics in an AVEVA-hosted industry forum in August 2023. Here's a sampling of what we heard.

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Sustainability is the new black

Does your automation system monitor every facet of your infrastructure, from lab equipment and hazardous materials to lighting, HVAC, energy and water consumption, look for opportunities to launch condition-based maintenance work orders and even dash off polite, personalized reminders when an employee forgets to close the flume sash hood?

That's exactly what happens on one 40-building pharma campus, we learned. The "Green Labs" initiative aims to make it easier for scientists to drive sustainability in everyday operations. The company has seen its non-GMP AVEVA™ PI System™ instance grow 30x in just four years as the scale and scope of the monitoring and management program has increased. The program has helped drive the lab's overall RAMS (reliability, availability, maintainability and safety), but the primary goal has been to identify opportunities to conserve water, energy and other precious resources.

Green Labs was one of many examples of turning data management into serious sustainability and cost savings. One AVEVA partner shared how they enhanced energy data modelling gathered from a pharma company's PI System to reduce greenhouse gas emissions equivalent to 1,095 passenger vehicles driven for one year.

Sustainability and cost efficiencies are usually linked in industrial manufacturing, but the right choice isn't always obvious. The group had a lively discussion about the relative sustainability and costs of different pharmaceutical manufacturing materials. While traditional stainless steel materials cost more up front and once required environmentally harsh cleaning, newer single-use materials that are important for personalized medicine cannot be recycled. With over 20% of the new drug pipeline focused on personalized cell and gene therapy, participants predict greater adoption of these "use-once" materials.

Digital transformation: sink or swim time

One thing everyone in the room could agree on: "digital transformation" is perhaps the most widely used and least commonly understood term in the industry today. (One person recalled a COO who claimed digital transformation victory after switching from Microsoft Excel to SmartSheets.)

But they also acknowledged that transformation is a when, not an if. "**It's sink or swim time**," said AVEVA's John Baier, citing statistics that 85% of companies will implement AI and digital transformation in the next three years and 87% of manufacturers are already using the cloud.

> "Digital transformation is about turning data from a cost center to a profit center," said one leader. "We want to go from simply recording and analyzing **what** we make to prescribing what we **should** make."

One company is tapping AI and robotic process automation (RPA) to "automate automation," creating mixed-reality workflows that eliminate paper-based documentation. Another is using augmented reality to save over $800,000 in traditional training costs.

But transformation doesn't usually start with extended reality or prescriptive AI. Many organizations use AVEVA PI System and its asset framework technology as the foundation of an asset, process or even enterprise digital twin.

One participant cited the inspiring example Pfizer shared at AVEVA World 2022 about using this technology to accelerate collaboration, tech transfer between sites, remote work and decision making in the race to deliver the world's first MRNA vaccine in groundbreaking time.

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Cost efficiencies in a long-odds business

Mindful of the long odds that a drug successfully makes it to market, cost efficiencies were top of mind for many in the room. In recent years, many companies had perfected the art of just-in-time supply chain management so that they could reduce warehousing costs. But pandemic-related disruptions and an increasing reliance on contract manufacturing means that organizations are trying to factor in more contingencies – and that can get expensive.

So, many life sciences leaders are getting scrappy. A system integrator shared an example of using portable exhaust analyzers to systematically identify optimal golden batch process parameters. The small portable equipment allowed the team to work with limited lab space. AVEVA PI System's asset framework provided a logical layer, allowing operators to efficiently tag and analyze the results on a simple PI Vision web page, without expensive equipment or custom coding.

Another company shared its journey to digitize its master batch record processes. After a self-audit revealed a trend in documentation errors, the company adopted a range of strategies to streamline and automate processes. For example, bench-top scale integration reduced the need for manual scale recording and verification, MES integration automated raw material consumption tracking and system timers automatically tracked expiration time for units, filters and product fermentation.

Phase one of this Right First Time project delivered an 86% drop in errors. The new efficiencies translated to savings of over 3800 hours, $172,000 and two trees a year. Using AVEVA™ System Platform, AVEVA™ InBatch and AVEVA PI System along with other core systems, the plant is now using 90% paperless tickets, and on track to be 99% paperless by 2025.

How AVEVA can help

So how can AVEVA support industry goals around sustainability, digital transformation, cost efficiencies and more?

AVEVA experts shared detailed product roadmaps and in particular highlighted opportunities to leverage the cloud to drive faster, more informed and collaborative decision-making. This year, we launched AVEVA™ PI Data Infrastructure to augment the on-premises AVEVA PI System with cloud-enabled functionalities. The technology is particularly optimized for industrial data sharing with other applications, systems and trusted partners.

While acknowledging that critical GMP data will probably remain on-prem in the near term, that represents a small percentage of overall operations for many producers. Cloud-based sustainability reporting, for example, is an effective way to gather, analyze and take action on data from disparate enterprise systems, remote sites, local water and energy utilities, as well as partners such as CMOs, suppliers and distributors.

Why have many large or newer life sciences organizations already adopted a cloud-first policy? Data-hungry technologies such as AI, machine learning, extended reality and remote collaboration services demand cost-efficient, elastic cloud solutions for data management, sharing and visualization. Traceability in the cloud is far more advanced than on-prem. While AVEVA fully supports hybrid environments combining on-prem, cloud and edge systems, our SaaS solutions get first advantage of the latest security and feature upgrades while maintaining release, rollback and disaster recovery management.

That said, industry standards and expectations are still evolving, and these changes will impact AVEVA's choices in developing pharma-specific software features. See the resources links below for many ways you can learn more and share your opinions.

Useful resources	
Have a voice in AVEVA products	Share your feedback at **feedback.aveva.com**
Get exclusive access to pre-released AVEVA products and features	Contact your account manager about joining our **Lighthouse program**
Join the "connected ecosystem in life sciences" track at AVEVA World 2023 in San Francisco, October 23-26	Register at **events.aveva.com/aw-sf-2023**
Visit us at booth 704 at ISPE 2023 in Las Vegas, October 15-18	Register at **ispe.org/conferences/2023-annual-meeting-expo**

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