HCLTech | Supercharging Progress™

Introducing the lab of the future

NextGenLabs.ai brings digital experiments, design and execution to improve the pharmaceutical R&D process

Overview

Time and accuracy are critical in pharmaceutical research and development work. With traditional methods of managing, measuring and tracking complex processes and compounds in experiments being completed manually, how do you save time while ensuring quality does not suffer?

Traditional lab challenges

Traditional laboratory environments face many challenges that can slow productivity, accuracy and efficiency. These obstacles hinder the seamless operation of laboratories and hamper scientific progress.

Instrument silos: In traditional lab settings, instruments are often isolated from each other, leading to data fragmentation and inefficiencies in collaboration and data sharing.

Time-consuming manual steps: Manual data entry, documentation and analysis processes can consume valuable time and resources, reducing overall efficiency. Relying on manual processes can also increase the risk of errors, delays and inconsistencies in analysis and reporting.

Sub-optimal resource utilization: Inefficient allocation of resources, such as equipment, personnel and consumables, can lead to underutilization or overburdening of resources, impacting overall productivity.

Inability to move data end-to-end: Challenges in seamless data integration and transfer between different stages of the laboratory workflow can result in data silos and gaps in information flow.

Inability to track assets and consumables: Lack of effective systems for tracking inventory levels and usage of lab supplies can lead to stockouts, overstocking and unnecessary costs.

Lack of traceability and reproducibility: Inadequate systems for tracking and documenting lab processes and data lineage can compromise the traceability and reproducibility of research findings.

Limited scalability: Traditional lab setups may face challenges scaling up operations to accommodate growing research demands and data volumes, limiting flexibility and adaptability.

Lack of connectivity: Difficulty in getting information from instruments is the biggest barrier in lab automation.

With the number of considerations and complex processes in a research laboratory, how do you address these challenges, integrate your processes and plan for the future?

Introducing NextGenLabs.ai

HCLTech's NextGenLabs.ai solution takes a modern approach to laboratory processes. With this approach to digital laboratory management, the integrated digital lab can oversee all aspects of the lab, including processes, functions, information, communications and devices, to better manage lab activities.

Key components of an integrated lab

Lab digitization	Experiment digitization	Device connectivity and lifecycle management	Integrated ecosystem of instruments, applications, LIMS, electronic lab notebook, etc.	Change management	
Experiment automation	Build an interface between different LIMS and applications	Use RPA capabilities to automate data exchange between lab applications			
Lab data governance and management	Data governance master data tables, including analyses, product specifications, item codes, etc.	Static data management	Stability management		
Security and vulnerability	Day -1, Day 0 and Day + cybersecurity	Highly structured data-centric approach	Module installation	Version upgrades and vulnerability management	Patch installations
Lab instrument management	Instrument manager can oversee volumes, preventative maintenance, calibration and more	Instrument CDS integration (lab station module)	Parsing scripts		
Lab resource management	Standard and reagent manager can comprehensively oversee standards, reagents and consumables	Track and trace for devices and materials			
Sample management	Sample lifecycle	Result entry management	Folder, lot and batch managers	Scheduler configuration	
Reporting and analytics	Unified UI/single pane of glass reporting	Crystal reports development	Workflow development	User profile-based dashboard creation	Edge analytics/DIY reporting

NextGenLabs.ai benefits

One-click digital experiment execution

By implementing a solution that enables one-click digital experiment execution, laboratory staff can streamline and automate setting up and conducting experiments. This feature reduces the need for manual intervention in experimental procedures, saving time and minimizing the potential for errors. Researchers can quickly initiate complex experiments, increasing productivity and faster generation of valuable data.

Faster turn-around-time

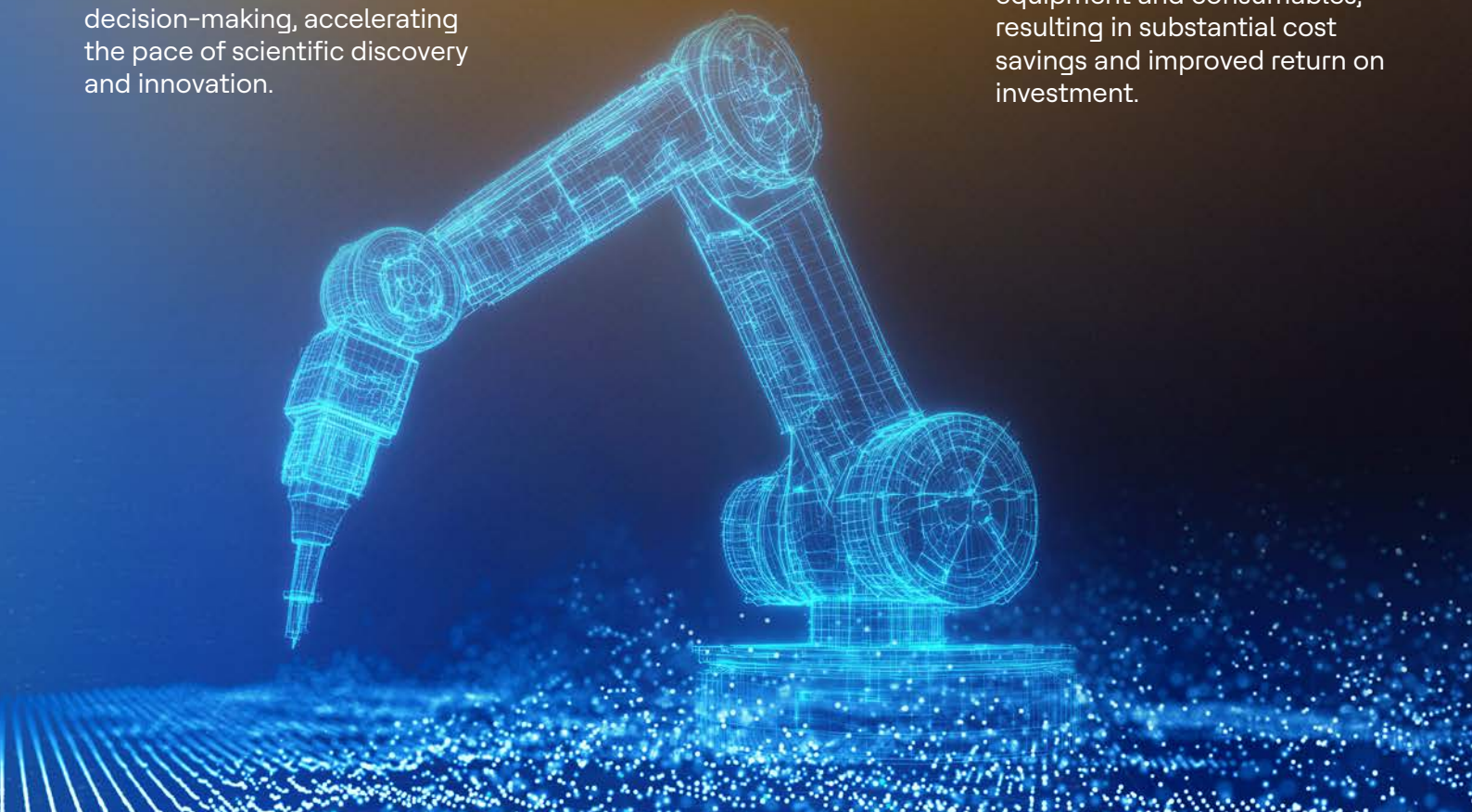
With streamlined workflows and automated processes, laboratories can significantly reduce the time required for conducting experiments and analyzing data. Researchers can expedite results generation by integrating capabilities for rapid data capture, processing and interpretation. This improved efficiency in turn-around time allows for quicker decision-making, accelerating the pace of scientific discovery and innovation.

Precision experimental outcomes

Researchers can achieve more accurate and reproducible experimental outcomes through real-time data collection and analysis. This heightened precision enhances the reliability of research results and contributes to advancing scientific knowledge and innovation.

Optimized lab operations costs

Laboratories can reduce operational expenses by automating routine tasks, minimizing wastage and optimizing resource allocation. Additionally, improved productivity and faster experimental turn-around times can contribute to more efficient use of costly lab equipment and consumables, resulting in substantial cost savings and improved return on investment.



A roadmap to a digitized lab of the future

1

Take inventory of all lab assets, including instruments, software and applications

2

Digitize and connect lab assets, instruments and consumables

3

Integrate lab systems and unify data for a seamless ecosystem

4

Digitize workflows, including lab processes and paper SOPs

5

Monitor, control and orchestrate all manual and automated workflows in real time

6

Drive process transformation and scientific innovation using advanced analytics and AI

Success Stories

Digitizing laboratory operations for a leading diagnostics company

Challenge

The client, a leading US-based commercial diagnostics company operating over 20 laboratories and managing approximately 40,000 pieces of equipment, struggled with significant inefficiencies stemming from manual, excel-based processes. This outdated approach hindered their ability to scale and meet same-day turnaround commitments. Key challenges included frequent equipment downtime, lack of system connectivity, excessive reagent waste and ineffective vendor management. Without real-time monitoring or integrated workflows, the company faced rising operational costs, reduced productivity and mounting difficulty in meeting growing client demands.

Objective

To overcome inefficiencies with equipment performance management.

Solution

HCLTech deployed its NextGenLabs.ai platform to digitize lab operations, enabling real-time monitoring, automated reagent tracking and improved SLA management. Our differentiated approach included the BGA twin concept, which enabled seamless data integration across diverse equipment types and our ability to provide actionable insights for vendor negotiations.

Impact

Our NextGenLabs.ai platform transformed the client's laboratory operations, delivering significant outcomes within the first year:

- 27% reduction in reagent usage
- 13% improvement in workforce productivity
- Enhanced vendor management
- Cost savings

Helping a leading pharmaceutical boost productivity by 20% within a year

Challenge

The client, a global pharmaceutical leader, aspired to transform oncology through precision drug delivery and large-scale collaborative research. However, progress was impeded by disconnected systems and fragmented workflows across 34 pharmaceutical and diagnostic laboratories worldwide. To realize their vision and accelerate cancer research, a comprehensive digital transformation was essential—one that would unify global operations, integrate over 140 applications and harness real-world data to enable personalized, data-driven cancer treatments.

Objective

To create a comprehensive research ecosystem.

Solution

HCLTech adopted a structured, phased approach to transform the client's lab ecosystem. We categorized lab instruments, developed custom connectors for legacy systems and digitized oncology experiment workflows. A global data-driven research platform was created to enhance collaboration and accelerate oncology innovation.

Impact

The "Lab of the Future" solution produced significant outcomes, enhancing oncology research and operational efficiency.

- 18–20% productivity gain within the first year
- Integration of 34 global labs
- Connecting providers, labs and supply chains into a unified ecosystem
- Research-focused differentiation emphasizing global collaboration
- Future roadmap including expanded data integration and AI-driven experiment management
- Accelerated personalized cancer therapies

HCLTech | Supercharging Progress™

HCLTech is a global technology company, home to more than 223,000 people across 60 countries, delivering industry-leading capabilities centered around digital, engineering, cloud and AI, powered by a broad portfolio of technology services and products. We work with clients across all major verticals, providing industry solutions for Financial Services, Manufacturing, Life Sciences and Healthcare, Technology and Services, Telecom and Media, Retail and CPG, and Public Services. Consolidated revenues as of 12 months ending March 2025 totaled $13.8 billion. To learn how we can supercharge progress for you, visit hcltech.com

hcltech.com