R&D Buyer's Guide

Unified Laboratory Informatics Software for Businesses

2025 white paper

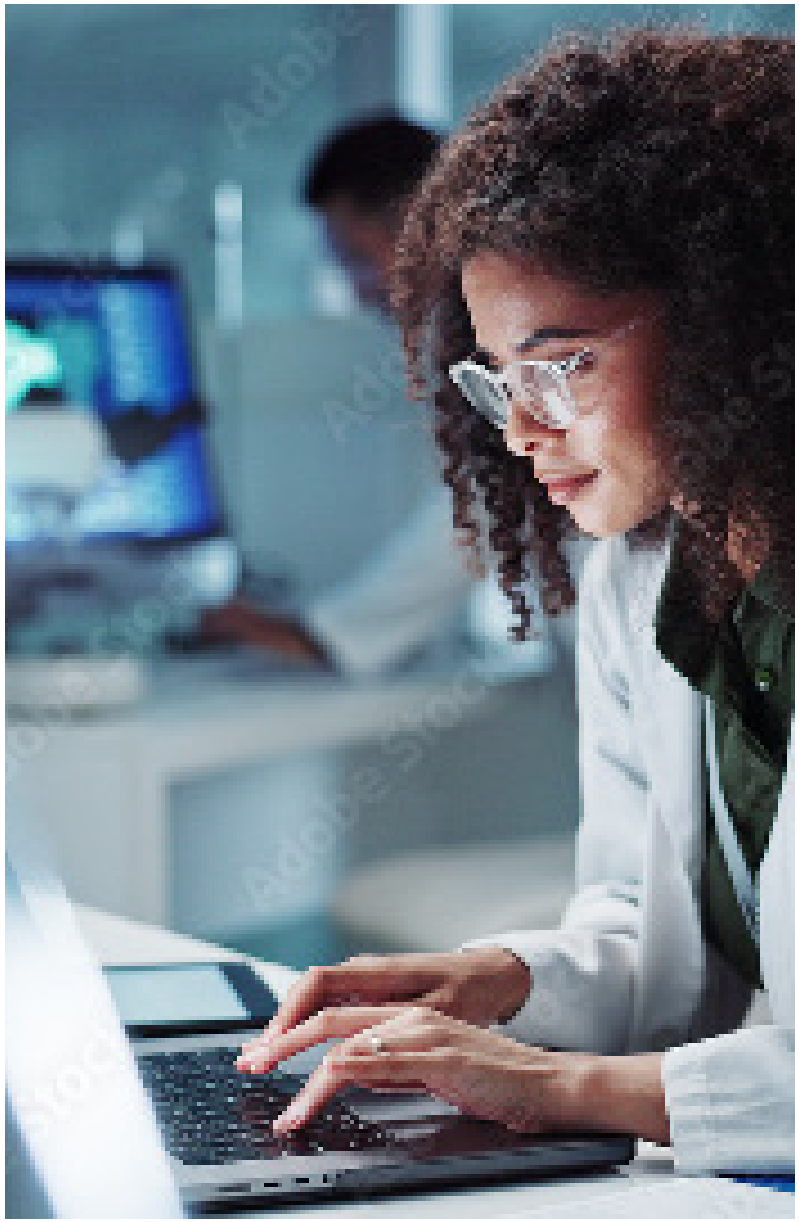
uncountable

Table of Contents

Introduction

For enterprise R&D organizations, managing data and processes is more critical than ever. As research becomes increasingly complex, with higher volumes of data generated from experiments, it becomes clear that more than traditional systems, such as LIMS, ELN, and SDMS, are required. These fragmented systems may work for specific functions but must improve to enable real-time collaboration, data integration, and advanced analytics across the entire R&D workflow. A more holistic solution is required: unified laboratory informatics software. This whitepaper will provide insights into why large enterprises should adopt this technology, how it differs from legacy systems, and how it helps R&D teams drive innovation, operational efficiency, and long-term success.

As we'll explore, Unified Laboratory Informatics Software addresses the unique challenges of modern R&D, including the harmonization of data across multiple functions, the establishment of a structured data backbone, and the ability to use advanced technologies like AI and machine learning. It enables organizations to scale more efficiently, facilitates global collaboration, and provides actionable insights that drive innovation.

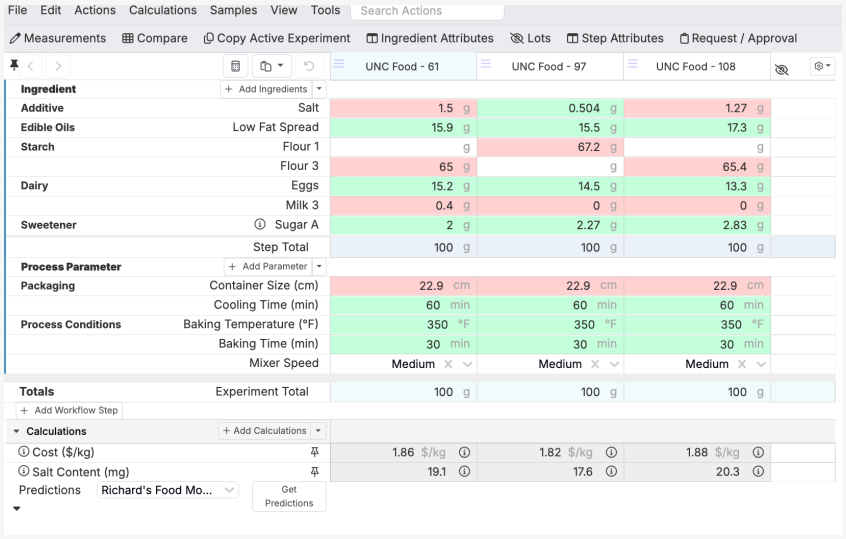


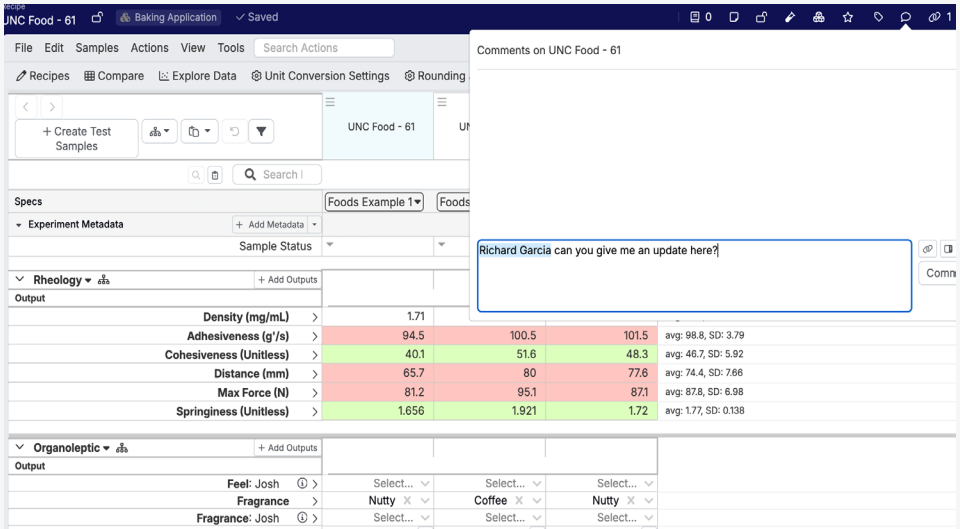
What is Unified Laboratory Informatics Software?

Unified laboratory informatics software is a comprehensive platform that combines every aspect of the R&D workflow—from data capture to analysis, collaboration, and compliance—into one cohesive system. Unlike traditional systems that operate in silos, unified software integrates the functionalities of LIMS, ELN, SDMS, and other legacy tools into a single platform. This enables seamless data flow across teams, departments, and geographies, removing barriers that often prevent efficient collaboration and decision-making.

A typical enterprise R&D organization collects data from numerous sources, including lab instruments, manual entries, and legacy software. These fragmented systems can make it challenging to aggregate data, leading to inefficiencies, errors, and missed opportunities for innovation. Unified laboratory informatics software eliminates these pain points by creating a structured data backbone that offers fluid, end-to-end harmonized data from all sources, ensuring consistency, accuracy, and easy access across the entire R&D value chain.

Furthermore, this unified system is not just a management tool—it's also a driver of innovation. With AI and machine learning capabilities built into the platform, organizations can leverage predictive analytics, automate routine tasks, and optimize experiment design. This empowers teams to make faster, more informed decisions, accelerating product development and improving R&D outcomes.

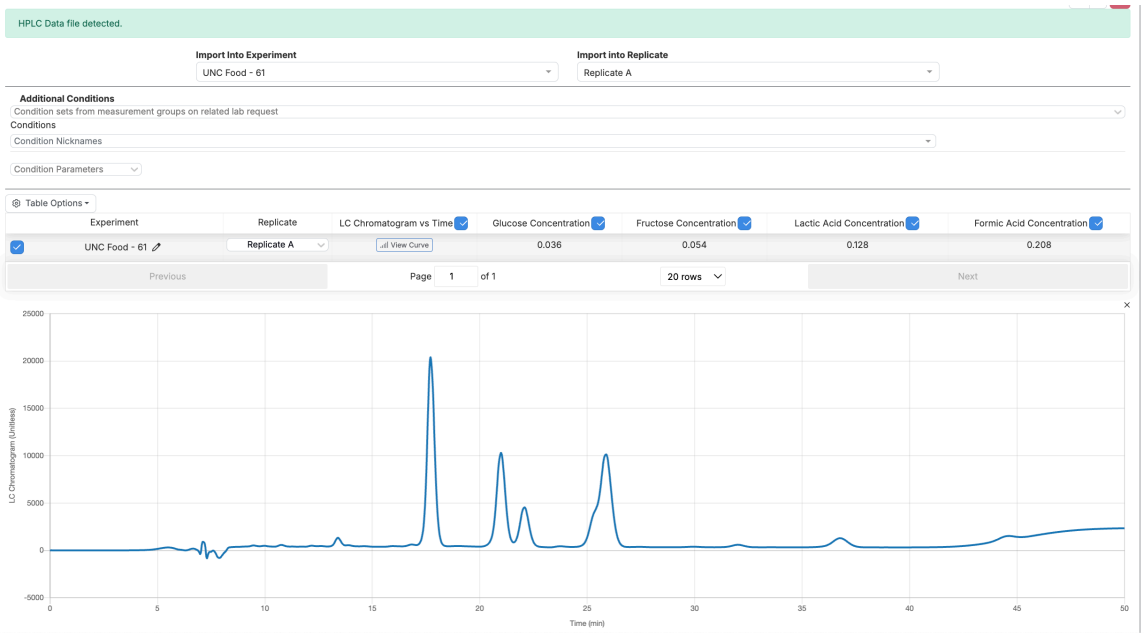




Why Large Enterprises Need Unified Laboratory Informatics Software

For large enterprise R&D labs, the scale and complexity of operations demand a solution that goes beyond what traditional systems can offer. These organizations often have multiple labs across different locations, generating vast amounts of data. Managing this data efficiently while ensuring consistency across regions and teams is a significant challenge. Moreover, large enterprises need systems that can accommodate the increased regulatory demands, compliance requirements, and data security concerns that come with operating on a global scale.

Unified laboratory informatics software provides the scalability, flexibility, and security that large enterprises require. Its integration with existing enterprise systems, such as ERP and supply chain management tools, ensures the entire R&D operation runs smoothly. Additionally, the platform's centralized data management capabilities allow organizations to maintain a single source of truth for all their data, reducing redundancy and ensuring that every team works from the same consistent information.



The ability to scale is crucial for growing large enterprises through expansion or acquisition. Unified platforms are designed to handle increasing data volumes, more complex workflows, and larger, more diverse teams. This allows organizations to focus on innovation without being bogged down by their software's limitations. Moreover, the platform's advanced compliance and security features help ensure that all data is managed in accordance with global regulations, reducing the risk of non-compliance.

Legacy Systems and Their Core Capabilities

Before transitioning to a unified solution, it's essential to understand the core functions of the legacy systems traditionally used in R&D labs. While valuable, these systems are often limited in scope and integration capabilities.

Common Digital Legacy Systems:

Laboratory Information Management Systems: LIMS

LIMS (Laboratory Information Management Systems): Used primarily for sample tracking and workflow management, LIMS is often restricted to handling lab data related to inventory and sample management. It lacks comprehensive analytics capabilities and needs to be built for cross-functional collaboration.

Electronic Lab Notebooks: ELN

ELN (Electronic Lab Notebooks): ELNs digitally document experiments and research notes, replacing traditional paper-based notebooks. While this allows for better organization and access to experimental data, ELNs typically don't offer real-time data analysis or integration with other lab systems.

Scientific Data Management Systems: SDMS

SDMS (Scientific Data Management Systems): SDMS platforms manage raw data from laboratory instruments. They are excellent for data storage but often operate in isolation, making it difficult to use the data with other experiment results or for collaborative purposes.

Why Unified Laboratory Informatics Software is Different

While legacy systems each serve a purpose, their siloed nature limits the ability of R&D organizations to collaborate effectively, perform in-depth analytics, or scale efficiently. Unified laboratory informatics software changes this by consolidating all the functionalities of these legacy systems into one cohesive platform. This eliminates the need for multiple, often incompatible, third-party systems and provides a seamless user experience across all roles in the R&D workflow.

One Connected Source of Truth

A Unified Laboratory Informatics Software platform collects data from diverse sources and ensures that this information is harmonized and structured. From sample data within LIMS systems to raw instrument data in SDMS, everything is centralized in one database. This enables real-time analysis and reporting, eliminating manual data transfers between systems, which saves time and reduces errors. Such an approach ensures that data integrity and consistency are maintained across the entire laboratory workflow.

Fully Integrated Advanced Analytics

Traditional R&D software often depends on external tools, such as Minitab, Python, R, Excel macros, and other similar visualization tools to perform complex analyses or generate visualizations. Unified Laboratory Informatics Platforms, however, provide integrated analytics and visualization features allowing researcher to generate insights directly within the platform and also export that data to external tools if needed. This streamlines workflows and reduces reliance on multiple software solutions for standard analytical tasks.

Seamless Data Exchange & Accuracy

Unified Laboratory Informatics Software can bi-directionally connect with lab instruments, machinery, external systems and databases to facilitate seamless data exchange, ensuring that experiment results, measurements, and adjustments are all accurately recorded. The connectivity also enhances automation by enabling the platform to send instructions to instruments for experiment modifications, scheduling, or control tasks to improve operational efficiency while minimizing human intervention in routine processes.

Serving the Entire R&D Workflow

Unified laboratory informatics software is built differently than legacy systems because it serves all stages and functions across the R&D value chain, not just isolated parts of the workflow. In a typical R&D environment, different roles interact with data at various points in the process. Legacy systems tend to focus on one specific function—sample management, documentation, or data storage—leaving gaps in collaboration and data flow between teams. On the other hand, Unified platforms are designed to meet the needs of every role within the R&D organization.

Key Roles in R&D and How Unified Informatics Serves Them:

Scientists, Chemists, and Formulators

Unified systems provide real-time access to experimental data, allowing faster adjustments and optimization. This leads to more accurate formulations and quicker time to market.

Researchers and Engineers

These roles benefit from integrated data analysis and reporting tools that allow for cross-experiment insights, helping to optimize processes and drive innovation.

Data Scientists and Analysts

Platforms should have an open REST API or Python SDK that allows users to easily query data stored outside of Uncountable to build models using external tools such as Jupyter Notebook.

Lab Managers and Technicians

Unified informatics platforms streamline inventory management, equipment tracking, and workflow automation, ensuring labs operate efficiently and without delays.

R&D Managers and Executives

With access to a single source of truth for all data, R&D managers can make informed decisions based on accurate, up-to-date information, ensuring that projects stay on track and within budget. Project stage gates, progress towards goals, and connections to CRMs should all be included in a unified platform.

By serving the entire R&D workflow, unified platforms ensure that data flows seamlessly between these roles, facilitating collaboration and innovation at every stage of the research process. Legacy systems, in contrast, often silo data within specific tools, such as Excel spreadsheets, shared drives, and external databases, limiting access and creating bottlenecks in the flow of information.

Key Features of Unified Laboratory Informatics Software

Unified laboratory informatics software provides a broad range of features designed to meet the needs of modern R&D labs. These features streamline daily operations and provide the foundation for long-term innovation and growth.

End-to-End Data Integration

The platform captures data from multiple sources, including lab instruments, manual entries, and legacy systems, ensuring that all information is centralized, consistent, and easily accessible.

Bi-Directional Instrument Connectivity

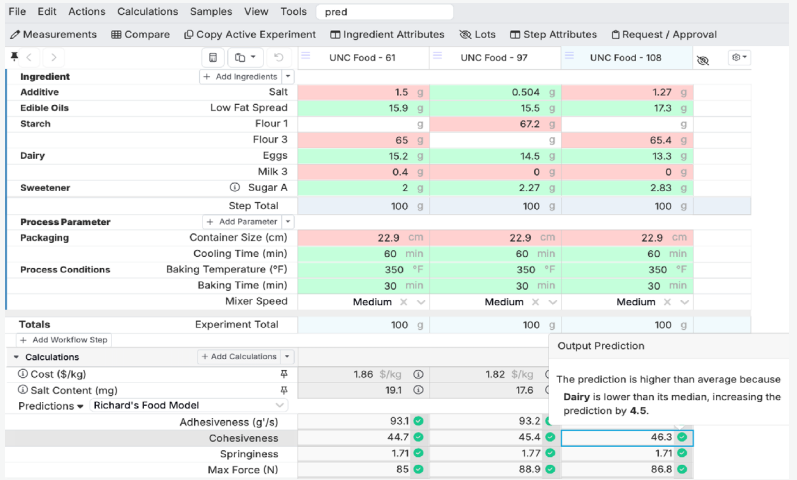
Unified platforms enable seamless bi-directional connectivity with laboratory instruments, offering real-time data capture and automation, more accurate experiment tracking, instrument calibration, and workflow optimization.

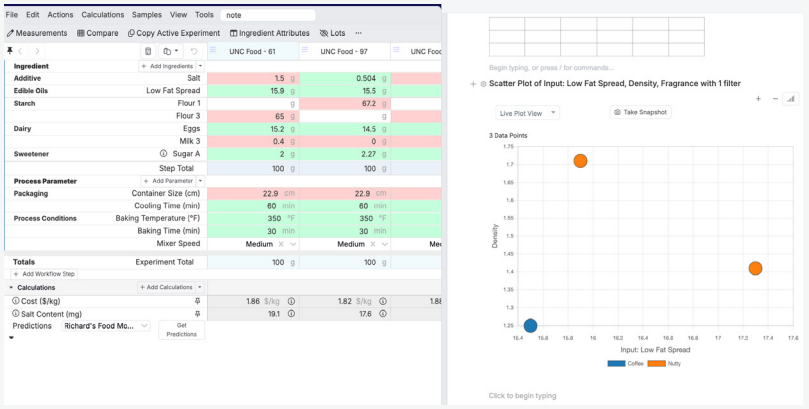
Structured Data Backbone

Confirm that the software can grow with your organization in terms of data volume and user capacity. Ask for case studies or examples of how the platform has scaled for other large enterprises.

Advanced AI and Analytics

Unified Lab Informatics platforms are integrated with AI and ML technologies that offer predictive modeling, experiment





Who is Unified Laboratory Informatics Software For?

Unified laboratory informatics software is designed for R&D organizations of all sizes, but it is particularly valuable for large enterprises operating across multiple geographies and industries. It is ideal for organizations in industries such as pharmaceuticals, biotechnology, chemicals, advanced materials, food and beverage, and personal care. Here are a few of the many industries that benefit from Unified Laboratory Informatics Software:

Advanced Materials and Chemical Manufacturing

R&D in materials science requires tracking complex experimental workflows. Unified platforms allow for better data integration, experiment optimization, and faster product development cycles.

Cosmetics and Personal Care

Formulators in the cosmetics industry benefit from centralized data management, real-time collaboration, and compliance with global safety regulations. Unified systems ensure all research and product testing data is harmonized and accessible.

Food and Beverage

These organizations require rigorous testing, data tracking, and compliance management to meet food safety standards and accelerate the development of new products.

Energy and Environmental Research

R&D teams in energy sectors, including renewable energy and oil and gas, need unified data platforms to manage large-scale projects and ensure sustainable innovation across complex workflows.

Pharmaceutical and Biotechnology

These organizations generate vast amounts of data from clinical trials, experiments, and product testing. Unified informatics platforms streamline data management and support compliance with stringent regulations like FDA and GxP standards.

Life Sciences

Beyond pharma and biotech, life sciences organizations—focused on diagnostics, genomics, and medical devices—benefit from the structured data and advanced analytics capabilities of unified laboratory informatics platforms to drive precision research and development.

Aerospace and Defense

R&D organizations in highly regulated industries like aerospace and defense must manage data integrity, compliance, and IP protection throughout complex development cycles, making unified informatics essential.

What to Ask Vendors When Evaluating Unified Laboratory Informatics Software

Selecting the right unified laboratory informatics platform is a critical decision. Organizations must ensure that their chosen software aligns with their goals, workflows, and compliance requirements. Here are key questions to ask vendors during the evaluation process:

Here are **key questions** to ask vendors during the evaluation process:

- [ ] **How does the platform support global collaboration?**
  For organizations with labs in multiple locations, ensure the platform provides tools for real-time collaboration, data sharing, and task management across teams.

- [ ] **What AI and advanced analytics capabilities does the platform offer?**
  Ask about built-in tools for predictive modeling, experiment optimization, and real-time data analysis. Ensure the platform can handle your team's analytics needs without relying on external tools.

- [ ] **How does the platform integrate with existing systems and tools?**
  Ensure the platform integrates with current ERP, internal databases, and legacy systems, allowing for efficient data migration and harmonization.

- [ ] **How scalable is the platform?**
  Confirm that the software can grow with your organization in terms of data volume and user capacity.

- [ ] **What compliance and security features are built into the platform?**
  Evaluate the platform's ability to handle global compliance needs, including automated audit trails, data encryption, and regulatory reporting.

- [ ] **Does the platform support bi-directional instrument integration?**
  This is critical for labs that rely on lab instruments for real-time data capture and automation. Ask whether the platform supports bi-directional connections to ensure seamless integration with your lab equipment.

- [ ] **What level of customization does the platform offer?**
  Every organization has unique workflows. Confirm that the platform allows for configuration to fit your team's specific needs and processes.

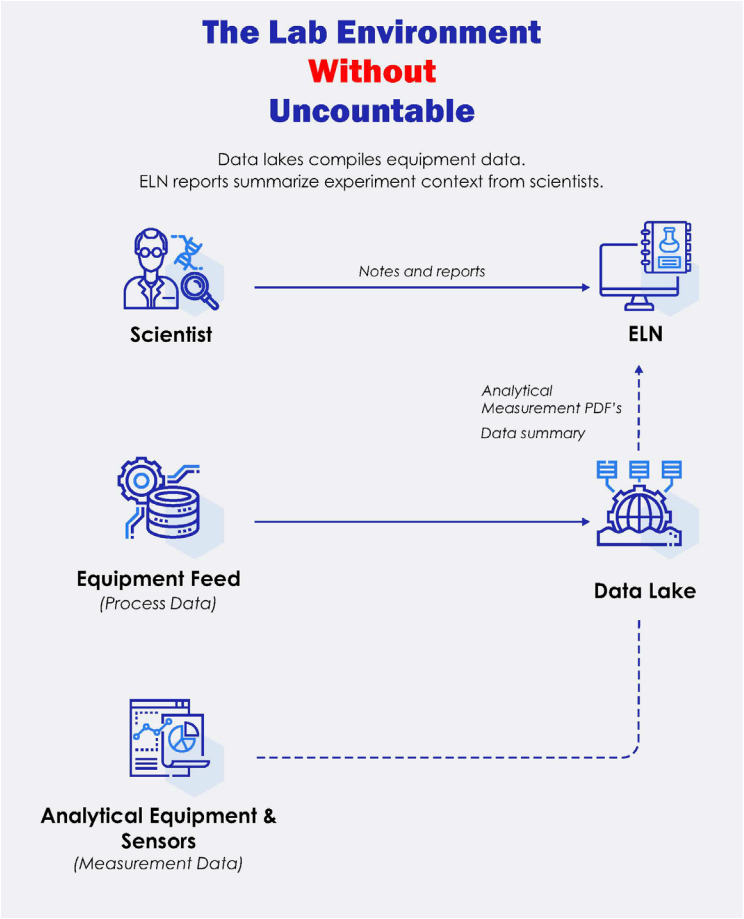
- [ ] **What level of support and training is provided post-implementation?**
  Ask about the vendor's support after implementing the system, including training resources, customer support, and ongoing software updates.

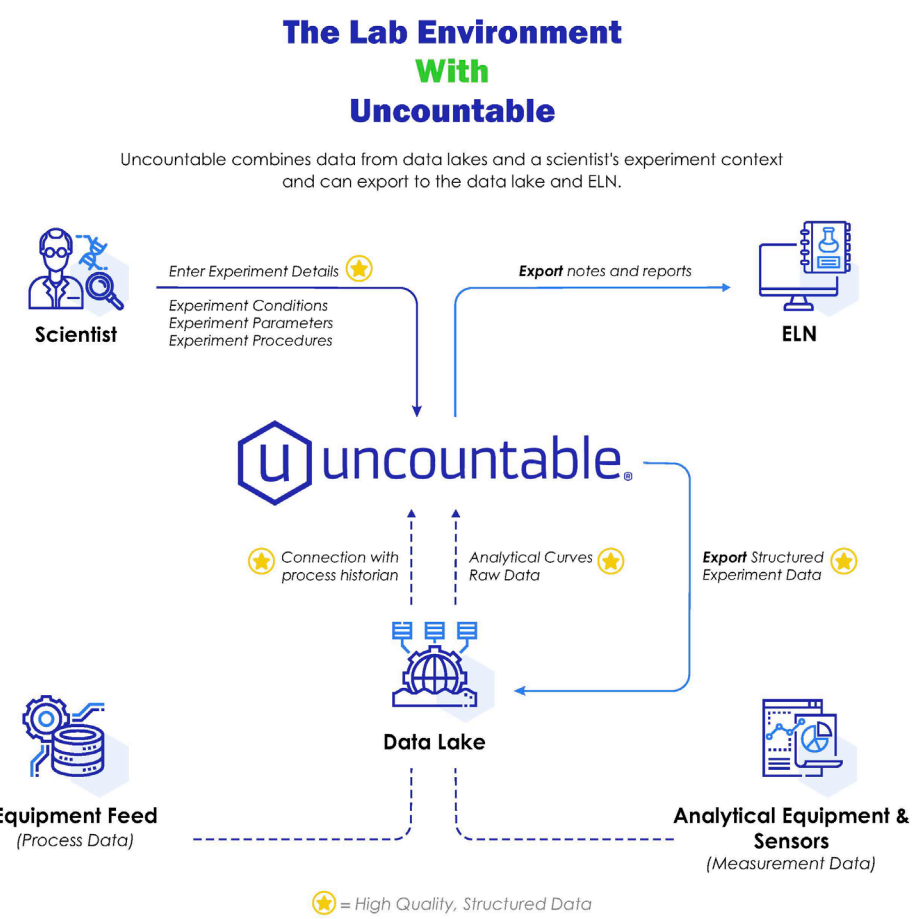
The Role of Uncountable in Unified Laboratory Informatics

Uncountable is proud to be the first company to introduce a unified laboratory informatics platform. Our journey began as a consultancy specializing in advanced data analytics and machine learning for enterprise R&D organizations. We worked closely with Fortune 500 companies to optimize their research processes. Still, we quickly realized that many organizations needed more structured, high-quality data to leverage AI and analytics tools fully.

This realization led to our pivot from a machine learning-based company to a platform-first company. We built Uncountable's unified laboratory informatics platform from the ground up, focusing on how data is captured, structured, and managed across the entire R&D workflow. Our platform addresses the foundational challenges of data integrity, scalability, and collaboration, providing R&D organizations with the tools they need to thrive in the age of AI-driven research.

Uncountable's platform is cloud-based and built for the future, with advanced data analytics and machine learning capabilities integrated into the core system. Creating a structured data backbone ensures organizations can manage their data efficiently, drive meaningful insights, and ultimately





Conclusion: Key Takeaways

A New Era of R&D Software

Unified laboratory informatics software marks a new chapter in R&D systems. Unlike legacy tools limited to specific workflows, unified informatics supports every stage of the R&D value chain, from data capture to experiment design, analytics, and compliance. By centralizing data and automating processes, unified platforms eliminate silos created by tools like Excel, shared drives, and external databases, empowering organizations to work smarter and faster.

Building a Foundation for the Future

Unified laboratory informatics creates a structured data backbone supporting advanced analytics and AI. By capturing and harmonizing data across roles—from scientists and chemists to data scientists and R&D managers—the platform ensures all teams work from a single source of truth. This foundation improves collaboration and positions organizations to leverage AI, machine learning, and other technologies to drive future innovation.

A Scalable, Comprehensive Solution

For large enterprises, scalability is critical. Unified platforms grow alongside organizations, accommodating larger datasets, complex workflows, and global teams. By consolidating legacy systems into one cohesive platform, unified informatics enables organizations to scale without sacrificing efficiency, data integrity, or adaptability, ensuring robust support for evolving R&D processes.

Unified Laboratory Informatics Software

As the first company to introduce a unified laboratory informatics platform, Uncountable leads industry transformation. Our cloud-based platform, built on expertise in data analytics and machine learning, helps R&D teams maximize their data's value. By solving the challenges of fragmented systems and providing a scalable, AI-ready solution, Uncountable empowers teams to innovate and achieve their strategic goals.

About Uncountable

Uncountable's Unified Laboratory Informatics Software platform is a cloud-based solution that revolutionizes R&D processes across industries like chemicals, materials, CPG, food and beverage, cosmetics, and biotechnology. By centralizing experimental data, it streamlines workflows, improves accessibility, and drives innovation, enabling researchers to focus on discovery instead of managing fragmented systems.

Uncountable combines LIMS, ELN, AI/ML insights, data visualization, instrument connectivity, and external system integration into one platform, simplifying data management and enhancing productivity. It unifies scientific inputs (e.g., formulations, measurements) with outputs, allowing users to analyze historical data, identify trends, and make data-driven decisions. AI/ML capabilities provide predictive insights, accelerating R&D timelines and reducing time-to-market.

With real-time collaboration tools and lab instrument connectivity, Uncountable ensures accurate data syncing and supports holistic data management across inventory, reporting, and workflows. Its intuitive interface makes complex data accessible, uniting siloed systems into a tailored solution. By centralizing data and delivering actionable insights, Uncountable empowers teams to innovate faster and achieve transformative results

A Few of Many Loyal Uncountable Customers

Beiersdorf, AGC, CABOT, LESAFFRE, TotalEnergies, REPSOL, Mondelēz International SNACKING MADE RIGHT, INDORAMA VENTURES, remmers, SunChemical a member of the DIC group, ZEON, Sika, SCG, CLARIANT, BEHR, syngenta, tesa, AirBoss Engineered Products, 6K, ROGERS CORPORATION, SOPREMA, TRINSEO, NAGASE

Get in Touch...

Unified laboratory informatics software is not just a new tool—it's a **new category of R&D software** designed for the future. With **Uncountable**, organizations can ensure they are ready for the next generation of data-driven research and development.

Learn how Uncountable's new Unified Laboratory Informatics can work for you.

Book a Demo

www.uncountable.com