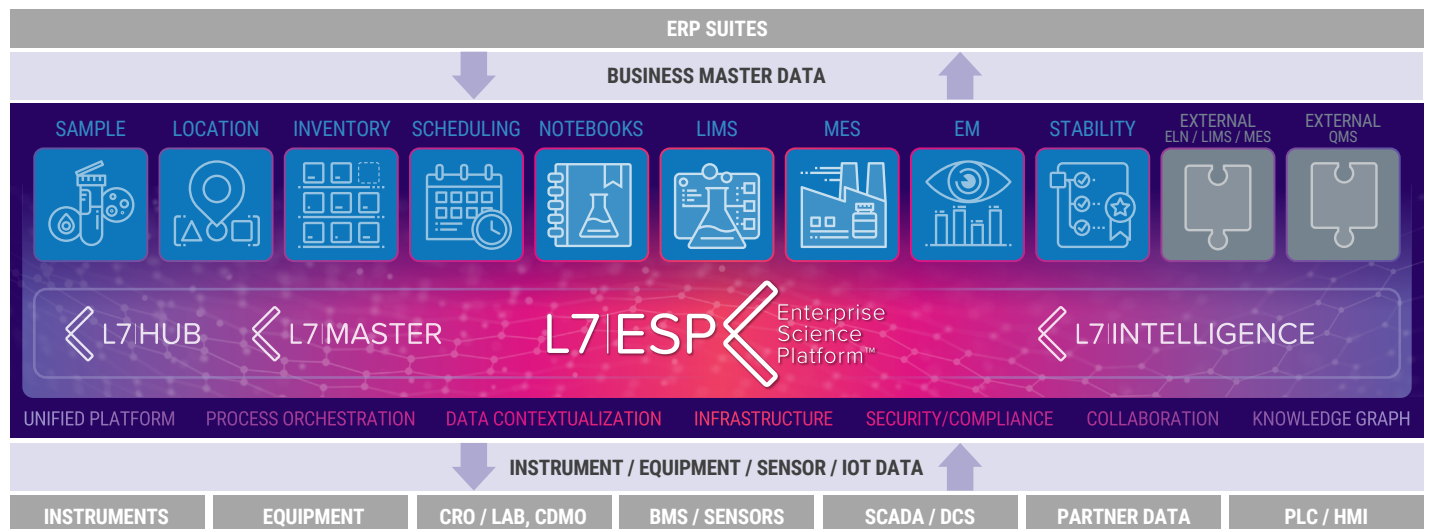


# Powering the Life Sciences Digital Revolution with L7|ESP

## The Data + Process Orchestration + Intelligence Platform

Built by scientists for the life sciences community - relentlessly focusing on serving our customers in research, development, manufacturing, and diagnostics with the overall goal of better clinical and operational outcomes for the life sciences industry.



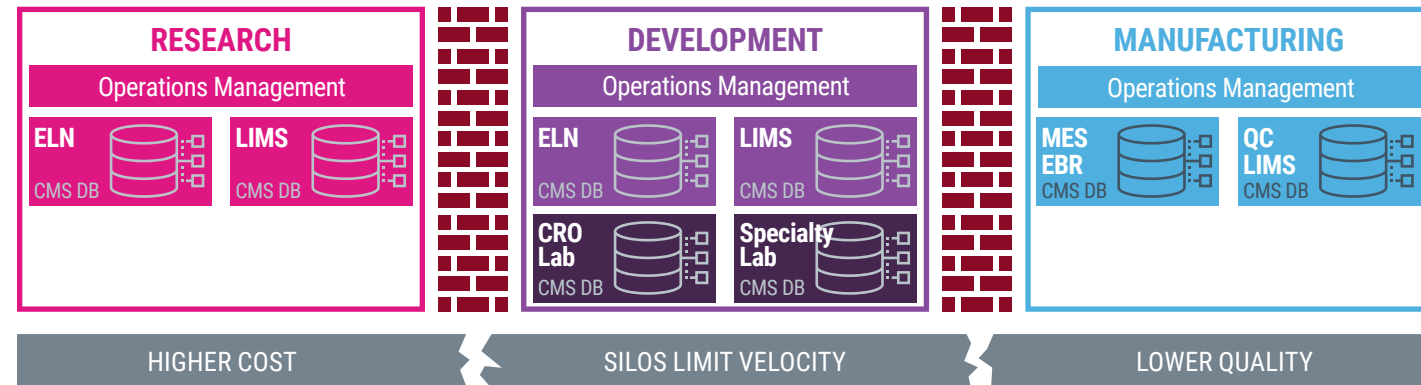
- Unified Platform** Integrated with pre-built best of breed apps (L7 LIMS, L7 Notebooks, L7 MES, L7 SCHEDULING) and out of the box methods/protocols (L7|HUB: a marketplace of pre-defined instrument connectors and scientific workflows) to digitally map and execute your wet and dry lab experiments and methods as well as manufacturing and QC testing processes.
- Workflow Orchestration** Automates and coordinates all systems, tasks, entities, applications, personnel, equipment, and instruments, and executes all lab and manufacturing processes. Captures all business (ERP), laboratory, and manufacturing process information during execution. Includes L7|MASTER, a low code/no code workflow development environment.
- Data Contextualization** Captures all business and laboratory process information via protocols while automatically contextualizing process data with entity-based master data. Manages all master data entities, process data protocols, and their intricate relationships in one single source of truth.
- Infrastructure** L7|ESP is cloud agnostic and runs on any public or private cloud or on-premise. Scales to any business, lab, and factory need regardless of size or complexity of the science. Keeps software, resources, and all technologies continuously running and up to date.
- Security/ Compliance** A highly secure and regulatory compliant platform, supporting adherence to clinical/personal data regulations for all types of data management and manipulation. Tracks full provenance of all data. Controls information access.
- Collaboration** L7|ESP with its L7|HUB extension follows FAIR guiding principles for both data and process models. Provides a collaborative, unified environment, for monitoring, sharing, and disseminating meta-data and meta-processes models among project team members within the organization and across multiple sites.
- Data Intelligence** L7|ESP via its L7|INTELLIGENCE extension unlocks process and operational insights. These process insights translate into improved resource utilization, increased business velocity, reduced operational costs and reduced variability in cycle times.

*"The L7|ESP Process Orchestration Platform along with FAIRification of process and data improves business intelligence, via data integration and contextualization, increases business velocity, and reduces costs."*

*"The regulatory compliant L7|ESP platform digitalizes and transforms laboratories and factories in the life sciences sector, including in basic research, drug discovery, drug development, manufacturing, diagnostic test development and clinical sample testing resulting in improved capacity and asset utilization, instrument integration, and shortened product life cycles."*

## CURRENT CHALLENGES: FRACTURED DATA SILOS & PROCESSES

Life science processes, be it in research, drug discovery, development, manufacturing, or diagnostic test development and execution, have grown in complexity and scale over the last decade, not the least because the industry is facing ongoing pressures such as ROI (return of investment) challenges and/or loss of exclusivity on key assets.



This rapid growth has resulted in **disconnected and sub-optimal laboratory process management systems and the lack of a unified data strategy that would provide the necessary laboratory and business processes insights with the potential to shorten the overall product life cycle.** To overcome these challenges the industry quickly adopted innovative high-throughput technologies, heavily invested in modernizing data infrastructure, and – more recently – in Artificial Intelligence (AI) capabilities to derive insights from the rapid growing volumes of data. **To derive high value insights from an AI data model requires contextualized data as an input,** otherwise the saying “garbage in, garbage out” holds true. Adding AI capabilities on top of uncontextualized and siloed data returns sub-optimal results, while data volumes and costs of storage are continuing to grow without an equivalent ROI expected from these new IT investments.

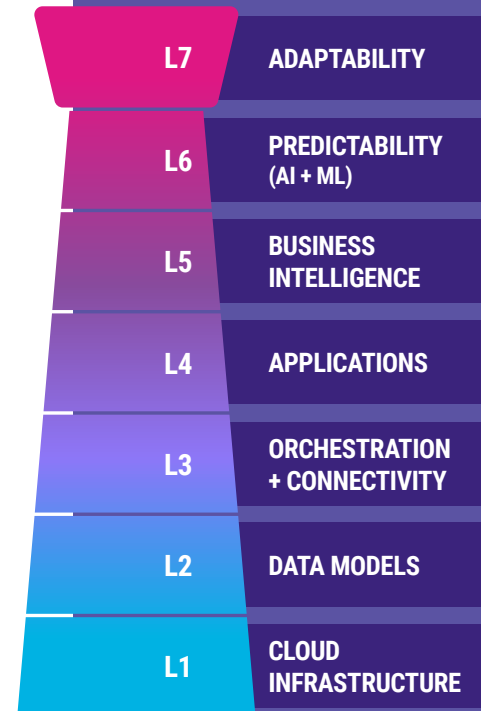
### Fractured Processes and Data Can Be a Threat to Achieving ROI Goals

Siloed data systems across labs and factories, not only result in high maintenance and integration IT costs, but also a loss in process and business knowledge that could be translated into increased business velocity and shortened product life cycles (aka faster drugs to market).

- **Fractured vendor and home-grown systems** (i.e., different information management systems that manage the laboratory processes | ELN, LIMS, EBR, MES, QC LIMS) across different groups and departments in drug discovery, development, and manufacturing.
  - Lab processes are fractured and disconnected across an organization.
  - Legacy systems (e.g., ELN or LIMS) are not able to handle the advances in data sciences.
- **No foundational, company-wide data strategy** to make data and processes findable, shareable, accessible, and reusable between labs and scientists within and across departments, organizations, and multiple sites.
  - The data collected ends up being fractured, disconnected, and siloed.
  - The data collected is not easily findable and accessible to data consumers to solve and improve laboratory and business processes resulting in missed opportunities.
  - Lack of visibility and transparency on research, laboratory, and business data across labs.
    - Regulatory submissions become onerous and expensive.
- **High IT Cost** to maintain the various laboratory information management systems and data infrastructure.

## THE SOLUTION:

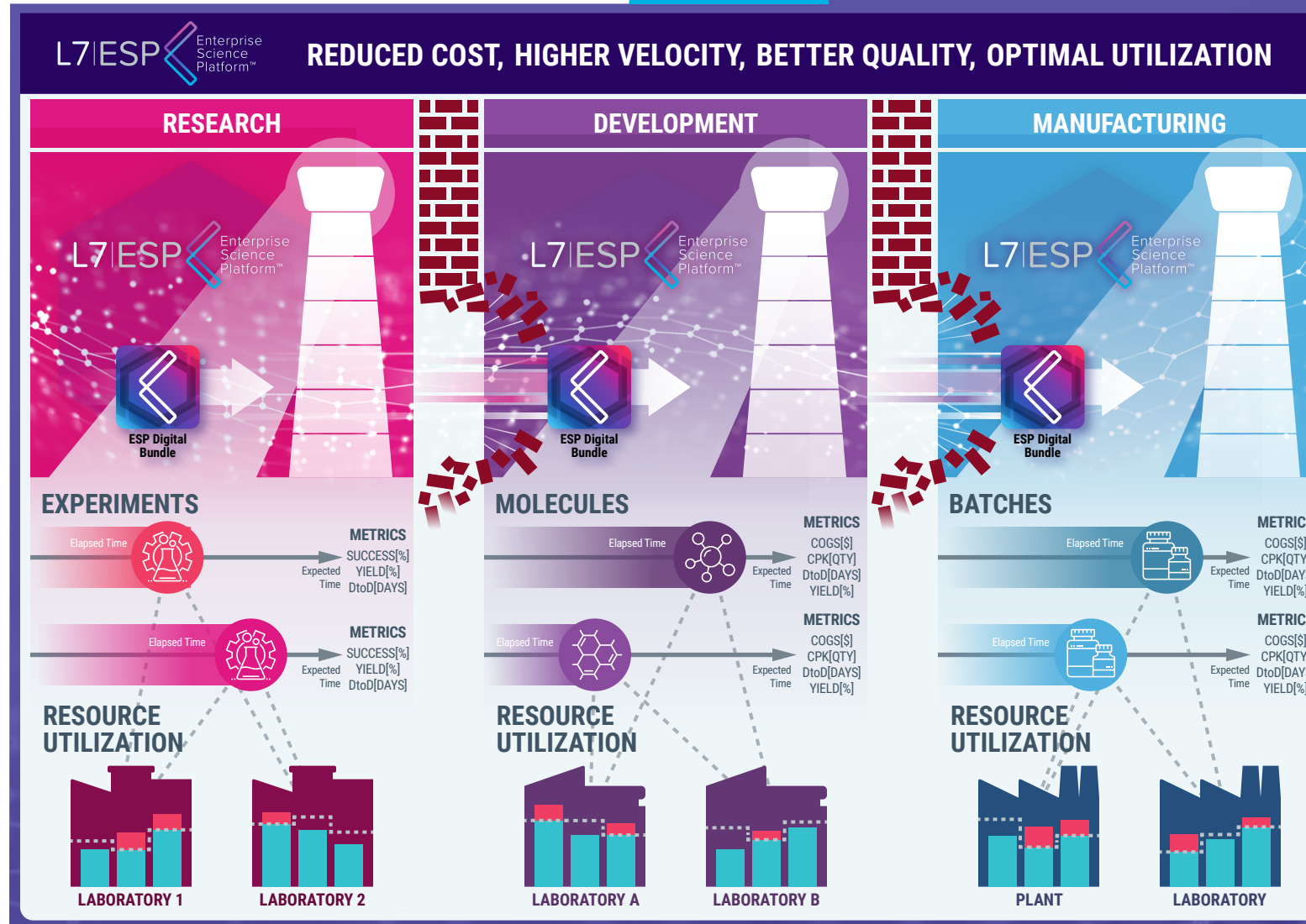
**L7|ESP - A UNIFIED PLATFORM** which contextualizes data and **ELIMINATES** business SILOS via **ORCHESTRATION**



### Purpose Built for the Life Sciences, Based on Industry 4.0 Principles

The Unified Platform L7|ESP is built based on best-practices of industry 4.0 principals (The Fourth Industrial Revolution, Klaus Schwab, 2017), which reinvented how life science businesses conduct their research and develop, manufacture, and distribute their products. Technologies, such as Industrial Internet of Things (IIoT), cloud connectivity, AI, and machine learning (ML) are nowadays becoming deeply woven into the drug discovery, development, and manufacturing processes. Taking advantage of this unified and integrated approach to bringing new drugs to market results in highly connected and informed people, products, factories, and assets. Combining accuracy and speed of 4.0 tools with the creativity and talent of people results in a win/win situation for both the workforce and the bottom line of a company. Drug research, development, and manufacturing operations become more efficient and productive, with individual teams and team members being relieved of low value and repetitive operational tasks, providing them with the opportunity to efficiently collaborate instead with smart technologies embedded in the evolving technological landscape and the AI-powered future of their work.

The L7 Informatics' **Unified Platform L7|ESP**, with its Workflow Orchestration and Data Contextualization, **meets today's and tomorrow's organizational needs of any life science organization aiming to digitalize their data and scientific processes in order to maximize the total return on information technology investment.** The L7|ESP data and workflow orchestration system automates, optimizes, and executes tasks, provides a holistic approach to scientific process and business management, and can be extended with trending and charting tools for real-time operational and scientific insight.



### An Architecture for Digitalization Resulting in Shortened Product Life Cycles

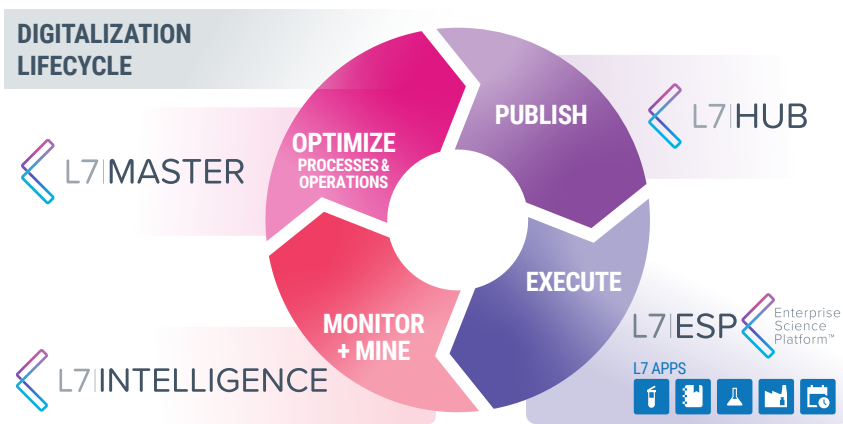
The L7|ESP platform integrates all common data information management systems, including L7 Notebooks, L7 LIMS, L7 MES, and L7 Scheduling, but also other resources such as Instrument Connectors, Sample Registration, Location, Receipt Accessioning, Logistics, Inventory, Environmental Monitoring, Stability Testing, Custody of Chain, and Data Analytics

- **Works with legacy systems:** Allows businesses to layer in L7|ESP alongside while continuing to use legacy systems (ELN, LIMS, MES, etc.) already invested in. L7|ESP can contextualize data across disparate legacy systems and bring them under the umbrella of a unified platform and data layer.
- **Replaces redundant systems and upgrades legacy technologies:** Allows the gradual decommissioning of redundant systems, while also replacing existing LIMS and ELN systems that cannot handle the emerging scientific and technology advancements.
  - Provides in an IT strategy for the future which will reduce legacy maintenance cost.
- **Ensures efficient operations:** Allows the optimization of enterprise-wide scientific data and process management systems which results in optimized end-to-end (E2E) data and processes.
  - Creates visibility in the product life cycle process across the entire organization from research, to development, scale-up, and manufacturing or diagnostics.
  - Ensures high performance in terms of costs management and insights delivery resulting in increased quality and speed of process execution.
- **Creates transparency:** Enables scientific information sharing between labs, programs, and across the organization.
  - Provides visibility on product data across the product value chain within an organization.



# THE L7|ESP UNIFIED PLATFORM IS DESIGNED TO UNIFY DATA & ORCHESTRATION ACROSS THE CONTINUUM OF LIFE SCIENCES PRODUCT DEVELOPMENT

The L7|ESP virtuous digitalization lifecycle of design, publish, execute, monitor, mine, and optimize results in improved and redesigned processes and operations with increased operational efficiency and overall reduced costs across research, development, manufacturing, and quality operations.



L7 ESP Value Point	Operational Benefit	Result
<b>CONTENT</b>		
<ul style="list-style-type: none"> <li>Pre-defined and reusable scientific content</li> </ul>	<ul style="list-style-type: none"> <li>Pre-built scientific content, instrument, and equipment connectors will jump start any process implementation</li> </ul>	<ul style="list-style-type: none"> <li>Overall product cost reduction</li> </ul>
<b>PROCESS MODEL</b>		
<ul style="list-style-type: none"> <li>For automation (instrument &amp; people) and execution of scientific workflows across biology &amp; chemistry, synthetics, and beyond</li> <li>Stores contextualized and granular data within a single ontology enforced data model</li> <li>Enables organizational reuse and collaborations among scientific groups, including tech transfer</li> </ul>	<ul style="list-style-type: none"> <li>Standardizes data across methods, instruments, and scientific disciplines which enables better and faster scientific and operational analysis and reporting</li> <li>Allows global harmonization, data and process(es) unification, and breaking down silos</li> <li>Enables sharing and organizational reuse of scientific protocols and processes between research, development, and manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>Cost and time savings</li> <li>Enhanced cross-departmental and organizational collaboration</li> <li>Shortened product life cycles</li> </ul>
<b>DATA MODEL</b>		
<ul style="list-style-type: none"> <li>Single place to enforce scientific meta-data, process data standards, and ontologies</li> </ul>	<ul style="list-style-type: none"> <li>Supports the move towards a common business data model</li> </ul>	<ul style="list-style-type: none"> <li>Increased business velocity and reduced IT costs</li> </ul>
<b>PLATFORM</b>		
<ul style="list-style-type: none"> <li>Infrastructure support to build "simple" role-based applications to reduce the number of databases</li> </ul>	<ul style="list-style-type: none"> <li>Write and maintain simple applications and reports without the need to replicate and move data from one platform to the next</li> </ul>	<ul style="list-style-type: none"> <li>Reduced number of IT platforms to manage</li> <li>IT cost reduction</li> </ul>
<b>REGULATORY</b>		
<ul style="list-style-type: none"> <li>Enables consolidation of regulatory submissions data and support of eCTD submissions formats</li> </ul>	<ul style="list-style-type: none"> <li>Faster regulatory submissions and reduced time to clinical trials results in reduced product life cycle time and operational expenses</li> </ul>	<ul style="list-style-type: none"> <li>Reduced product life cycles and operational costs</li> </ul>

## L7|ESP addresses data and laboratory management needs and challenges in life sciences across the value chain, specifically in:

- Research (academia and pharma) and diagnostics:** Research scientists, bioinformaticians/computational scientists, lab technicians, lab managers, and IT infrastructure managers
- Pharma and CDMO - small and large molecules and advanced therapeutics:** Process development engineers and analytical development scientists, bioinformaticians/computational scientists, IT infrastructure managers, GxP experts and quality reviewers, QC/QA associates and heads of QC/QA, and project/program managers
- Clinical sample management:** Regulatory scientists, QC/QA associates, project/program managers



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L7 Informatics reimagines data intelligence for modern life sciences and healthcare organizations. Beyond simple data management, L7 provides tools that optimize the flow of information between processes and people, unlocking innovation at every stage of the clinical, research, and manufacturing value chains.