

L7|SYNAPSE: The L7|ESP® Agentic Layer

CURRENT CHALLENGES

Life sciences organizations are under pressure to increase throughput while strengthening quality and compliance. Automation is expanding, workflows are becoming more complex, and execution must remain consistent and fully traceable across regulated environments. Yet many teams still operate across fragmented systems and documents. SOPs, protocols, batch records, and operational data often sit in different places, forcing users to search, cross-check, and escalate questions to a small set of experts during day-to-day work.

This fragmentation creates friction at the point of execution. Teams spend time reconstructing context instead of acting on it, slowing routine operations and extending response times during deviations, investigations, and change control. As organizations scale across programs, sites, and teams, these delays compound, and consistency becomes harder to maintain.

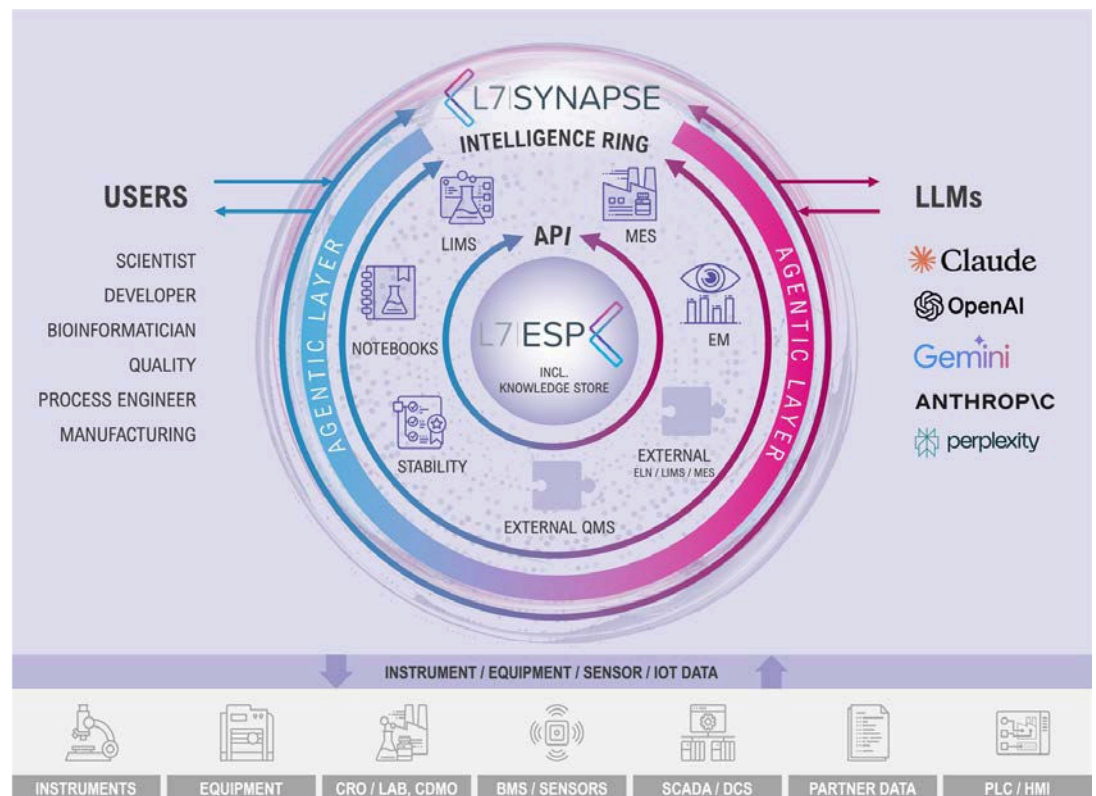
Large language models have raised expectations for faster access to information and simpler interaction with complex systems. However, in regulated operations, usefulness depends on more than fluent answers. Responses must be grounded in approved documentation and governed data, reflect the current state of execution, and respect user authorization. Without that operational foundation, AI can be compelling in pilots yet difficult to scale reliably in production. That is the practical gap between being AI-ready and making AI actionable.

SOLUTION

L7|SYNAPSE is an agentic layer around L7|ESP unified data contextualization and scientific workflow orchestration platform. Users can ask questions, build workflows, retrieve data, navigate apps, and generate summaries without needing to understand underlying data structures, APIs, or configuration patterns. L7|SYNAPSE also supports both typed and spoken queries, making it practical in environments where hands-free interaction is preferred, such as at the lab bench.

To deliver context-aware output, L7|SYNAPSE is backed by a private, organization-specific knowledge base with semantic retrieval (RAG/GraphRAG) that can ingest internal documentation such as SOPs, protocols, and batch records. Before invoking a large language model, L7|SYNAPSE retrieves the most relevant information from this knowledge base and from the governed platform context, then uses it to ground responses. Citations help users verify the source of an answer and accelerate review in regulated workflows.

L7|SYNAPSE can be connected to your preferred large language model, whether cloud-based or locally hosted, to align with security and compliance requirements. It can support the creation of L7|ESP artifacts, including workflows, protocols, expressions, data queries, reports, and widgets, and, where enabled, it can execute workflows, helping teams move from questions to action within the same controlled environment where work is performed.



CHARACTERISTICS/BENEFITS

- **Simpler Interactions:** Interact with L7|ESP using plain English to ask questions, retrieve records, and navigate the platform without needing to know underlying data structures or system architecture.
- **More Relevant Responses:** Before querying an LLM, L7|SYNAPSE first searches a private, organization-specific knowledge base to ground responses in your documentation (SOPs, Protocols) and governed data residing in L7|ESP, reducing generic or irrelevant AI output.
- **Flexible LLM Choice:** Connect L7|SYNAPSE to your preferred large language model, whether cloud-based (OpenAI, Anthropic, etc.) or locally hosted, to meet your organization's security and compliance requirements. Some prompt tuning may be required when switching models.
- **Faster Onboarding:** New users can begin interacting with L7|ESP using conversational language, lowering the learning curve associated with complex laboratory and manufacturing software.
- **Continuous Knowledge Base Refinement:** Administrators can add or update internal documentation, SOPs, and platform guides to continuously improve the relevance and accuracy of L7|SYNAPSE's responses over time.
- **Less Reliance on Support:** Helps users locate features, understand workflows, and find relevant records within L7|ESP without requiring support escalation or extensive training documentation.
- **Text & Speech Input:** Supports interaction via typed and spoken queries to reduce manual inputs at the lab bench as well as in manufacturing facilities.
- **Cross-Apps Data Retrieval:** Query information spanning multiple L7|ESP apps, such as L7 LIMS, L7 Notebooks, L7 Scheduling, and L7 Assets, from a single conversational interface.
- **Permission-Aware Interactions:** L7|SYNAPSE operates within L7|ESP's existing user permission framework, so responses reflect only the data a given user is authorized to access.
- **Faster Reports:** Generate plain-language summaries of records, run histories, charts, or operational data to support faster review and decision-making.

CAPABILITIES

- **Knowledge Grounding (RAG/GraphRAG):** Pulls source material from a private knowledge base before invoking an LLM to ground responses. *Examples: answer using ingested SOPs, protocols, or batch records; include citations.*
- **Natural-Language Platform Actions:** Supports natural-language navigation, data retrieval, artifact generation, and, where enabled, workflow initiation in L7|ESP. *Examples: open a record in context; generate a protocol or workflow draft; initiate a run with confirmation.*
- **Cross-Module Queries and Joins:** Queries across L7|ESP modules and combine related entities in one request. *Examples: join inventory usage with protocol values; pull scheduling status with batch context.*
- **Permission-Aware Results:** Honors L7|ESP permissions so responses and references reflect authorized access. *Examples: the same query returns different results for operator vs. QA vs. admin.*
- **Artifact Generation:** Generates L7|ESP artifacts from natural language, or existing customer documentation like SOPs, experiment descriptions or MBRs, including workflows, protocols, expressions, queries, reports, and widgets. *Examples: create expressions; generate charts or widgets from queried data; produce report drafts.*
- **Summaries and Reports:** Produces summaries and structured outputs from records and queried data. *Examples: summarize run histories; generate ad-hoc reports; draft a certificate of analysis where applicable.*
- **Knowledge Ingestion:** Ingests customer documents to improve relevance over time. *Examples: add or update SOPs and platform guides; keep responses aligned to current procedures.*
- **Semantic Retrieval:** Finds relevant information by meaning and intent, not only keywords. *Examples: find the SOP section for a step; locate related records from a plain-language query.*

L7|SYNAPSE IS FOR

- **Laboratory Scientists** who need quick access to protocol status and experimental results using typed or spoken queries.
- **Quality Assurance Managers** who need faster review of deviations, investigations, and historical records, with supporting references.
- **Operations Executives** who need high-level summaries of throughput and resource utilization from governed operational data.
- **Data Scientists** who need simplified, natural-language access to data retrieval, queries, and configured operational tasks.
- **IT and System Admins** who seek to streamline user support and system navigation.
- **Regulatory Affairs Teams** who need faster compilation of cited information from approved documentation and governed L7|ESP data records.
- **Clinical Manufacturing Leaders** who need real-time visibility into batch execution, deviations, and release readiness, grounded in structured, ontology-driven data, to ensure compliant, efficient scale-up from development to commercial production in an AI-driven CMC landscape.
- **Commercial Manufacturing Leaders** who need AI-powered insight into manufacturing performance, supply reliability, and release readiness, grounded in governed, ontology-driven data to optimize and scale compliant commercial production across global networks.



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ABOUT L7 INFORMATICS

L7 Informatics is on a mission to accelerate the pace of science. Our platform, L7|ESP®, serves as the execution layer for modern life sciences, unifying LIMS, ELN, MES, scheduling, and data into a single operating environment that takes organizations from AI-ready foundations to AI-actionable operations.