Future-Proofing Your Lab: Why LIMS is Essential for the AI Era

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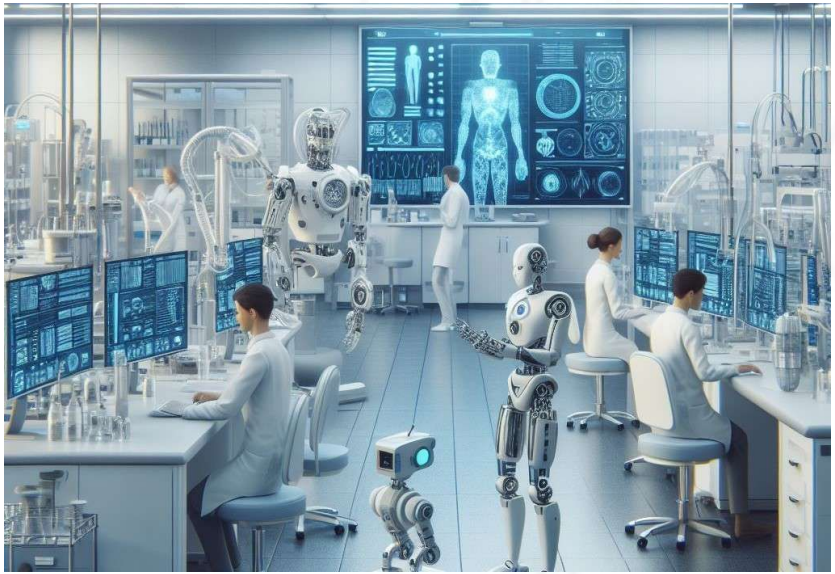
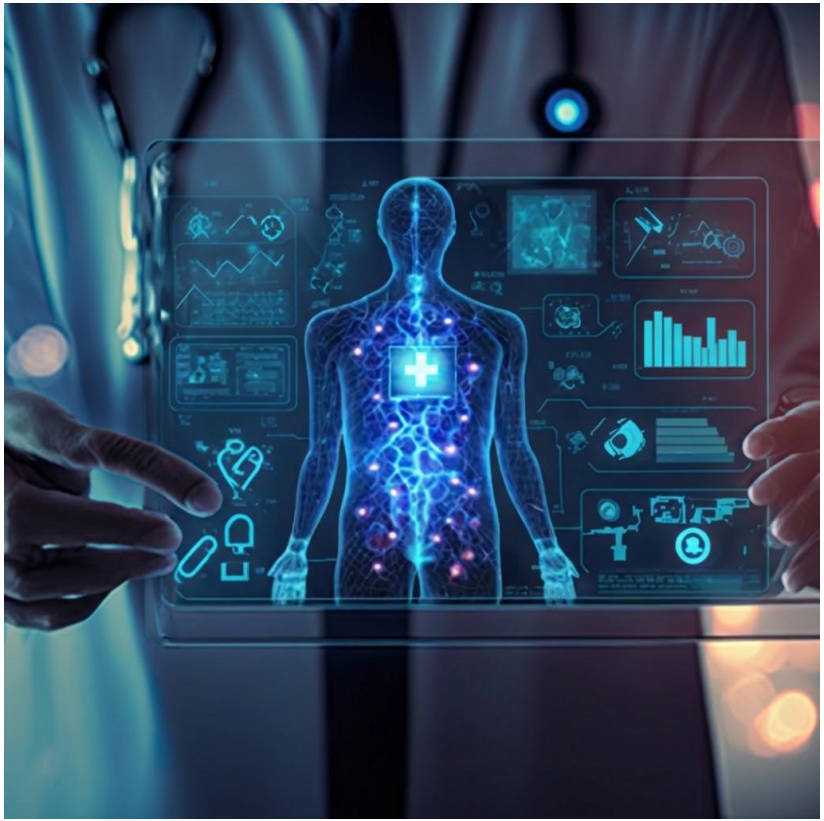
Agenda



- What's actually changing with AI in labs
- Why most labs are still unable to realize the benefits of AI
- What needs to be in place—now

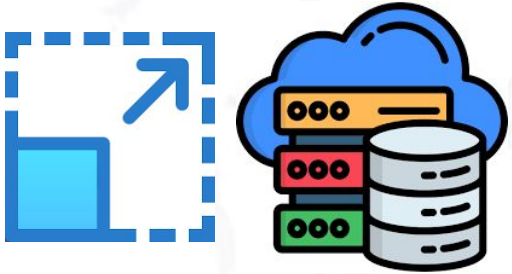
AI in Laboratories: The Current Reality

- Adoption is accelerating
- Use cases are expanding
- Readiness is not universal



AI is Scaling Faster Than Lab Readiness

AI Investment is Scaling Fast



Data Problems Scale With it

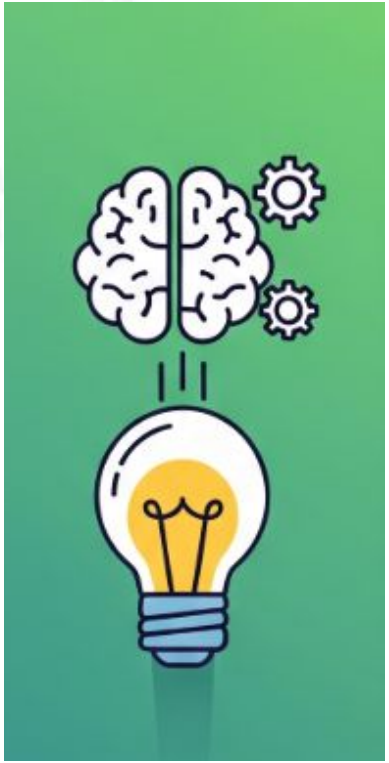
Delays Increase Long-term Risk

What AI Promises Modern Labs

Faster Insights

More Consistent Results

Informed Decision Making



The Invisible Infrastructure Behind AI

Data structure

Governance

Workflow control

The Non-Negotiable Truth

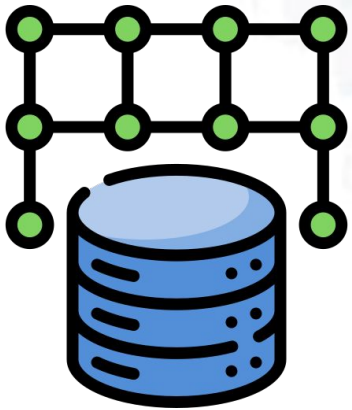
It exposes weaknesses

AI does not fix bad data

Labs feel the impact first

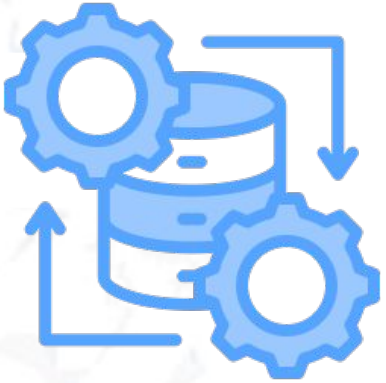
What Data Readiness Really Means

Structured Data



Trustworthy Data

Standardized Data



AI Exposes Operational and Data Gaps

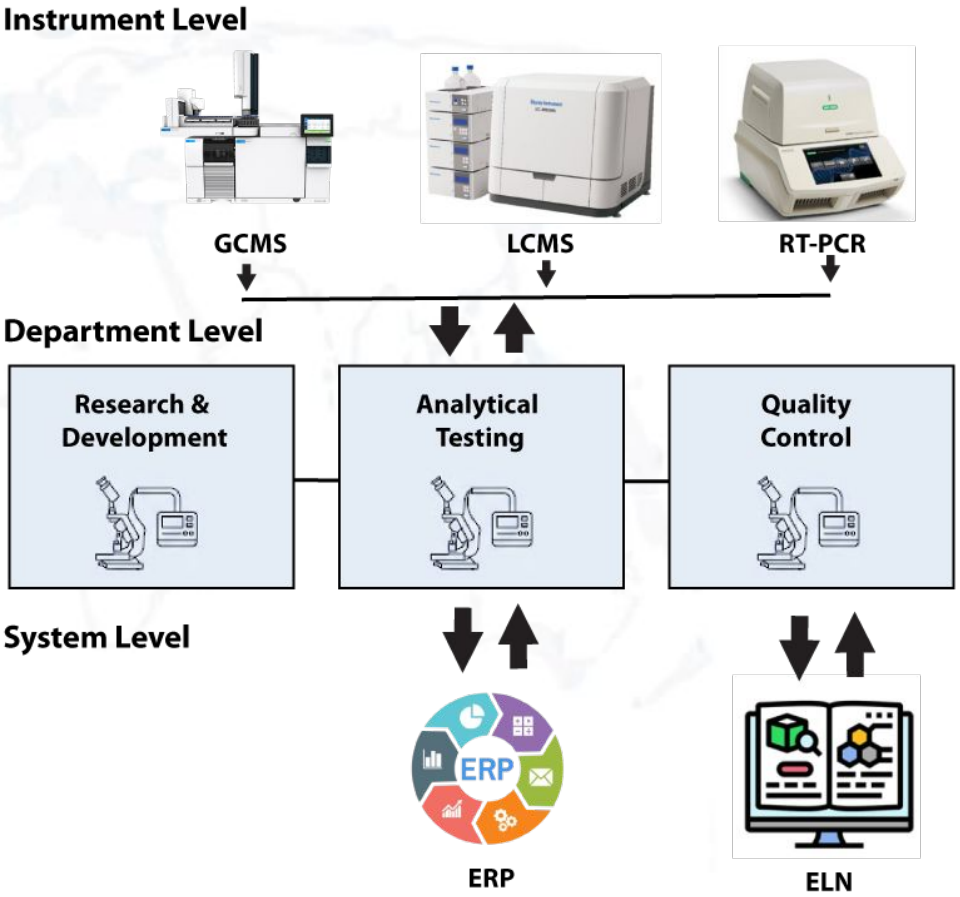
Disconnected Systems

Manual Workarounds

Inconsistent Records

Data Silos at 3 Levels

- Instrument Level
- Department Level
- System Level



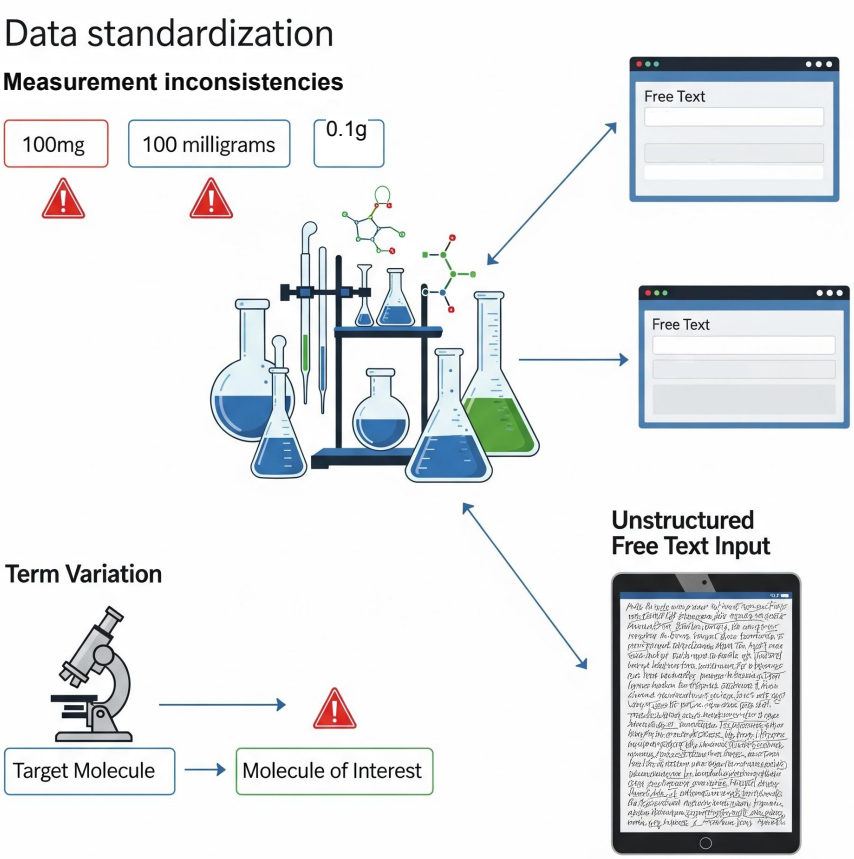
Legacy & Paper Processes

Unstructured Formats

Manual Reconciliation

Error-prone Workflows

Data Standardization Gaps



The Hidden Cost of Poor Data

- Time lost fixing data
- Reduced confidence in results
- Delayed insights

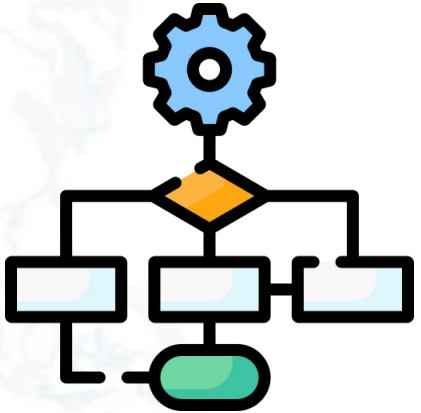
AI Readiness Is Not Just Technical

- People and processes matter
- Shared responsibility for data
- Staff training is essential

Build a Data-Ready Culture

Establish Clear Data Standards

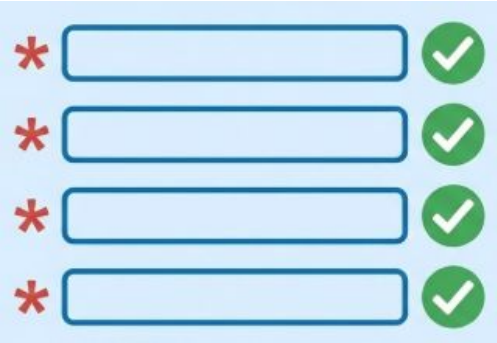
Define Ownership



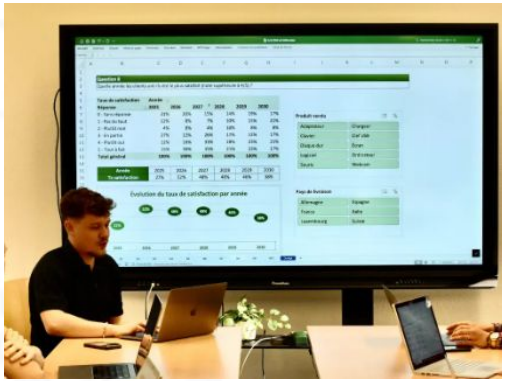
Implement Repeatable Workflows

Pillar 1: Consistency

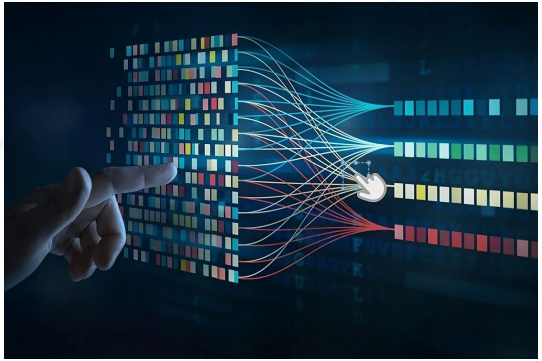
Pillar 2: Completeness



Enforce Mandatory Data Fields



Minimize Missing Values



Build Reliable Datasets

Pillar 3: Quality

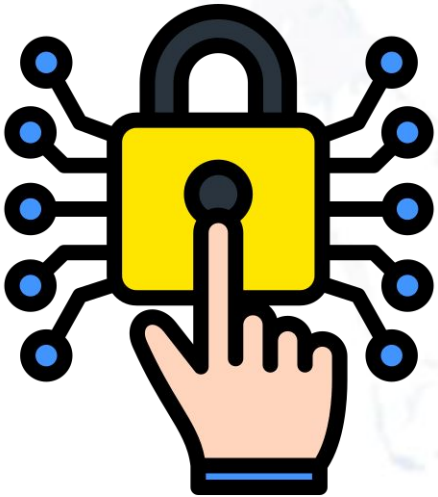
Implement Validation Checks

Enable Error Detection

Ensure Auditability

Pillar 4: Accessibility and Security

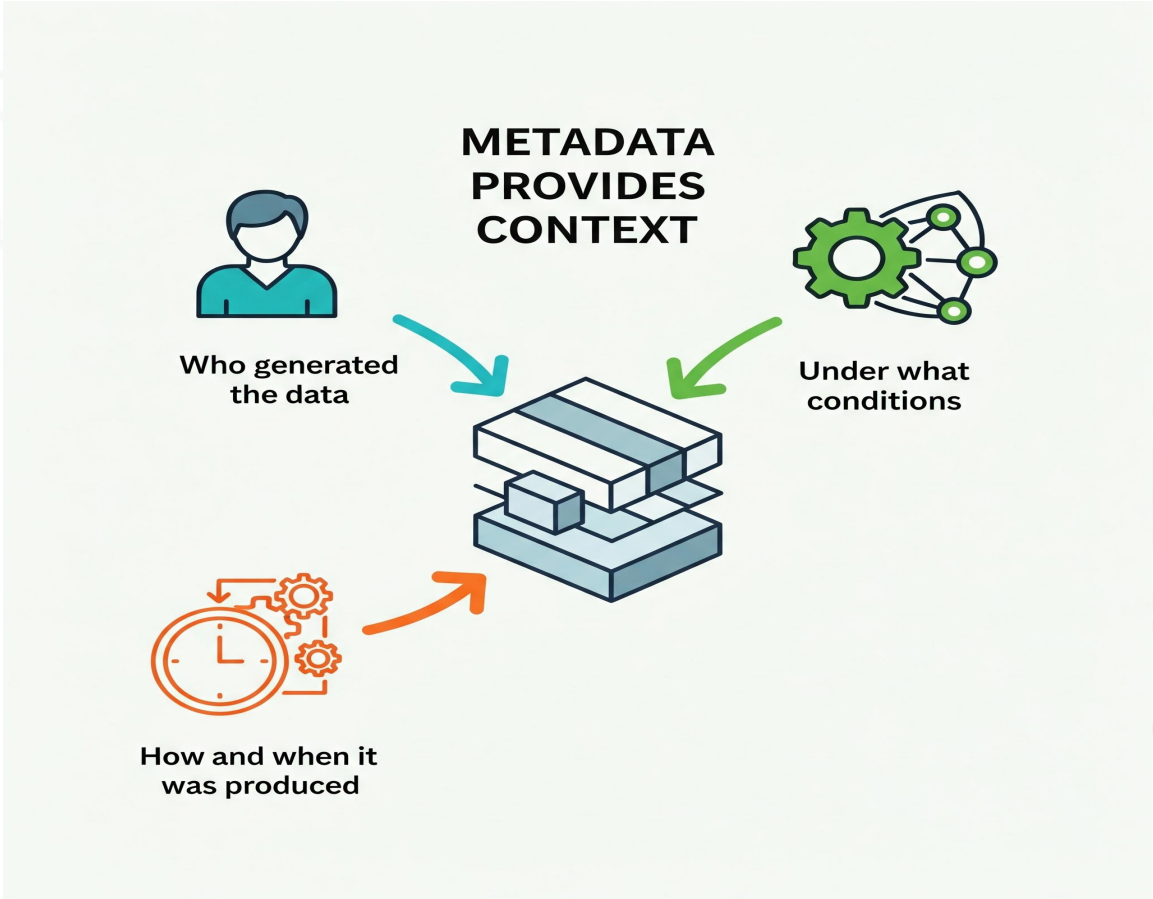
Centralized Access



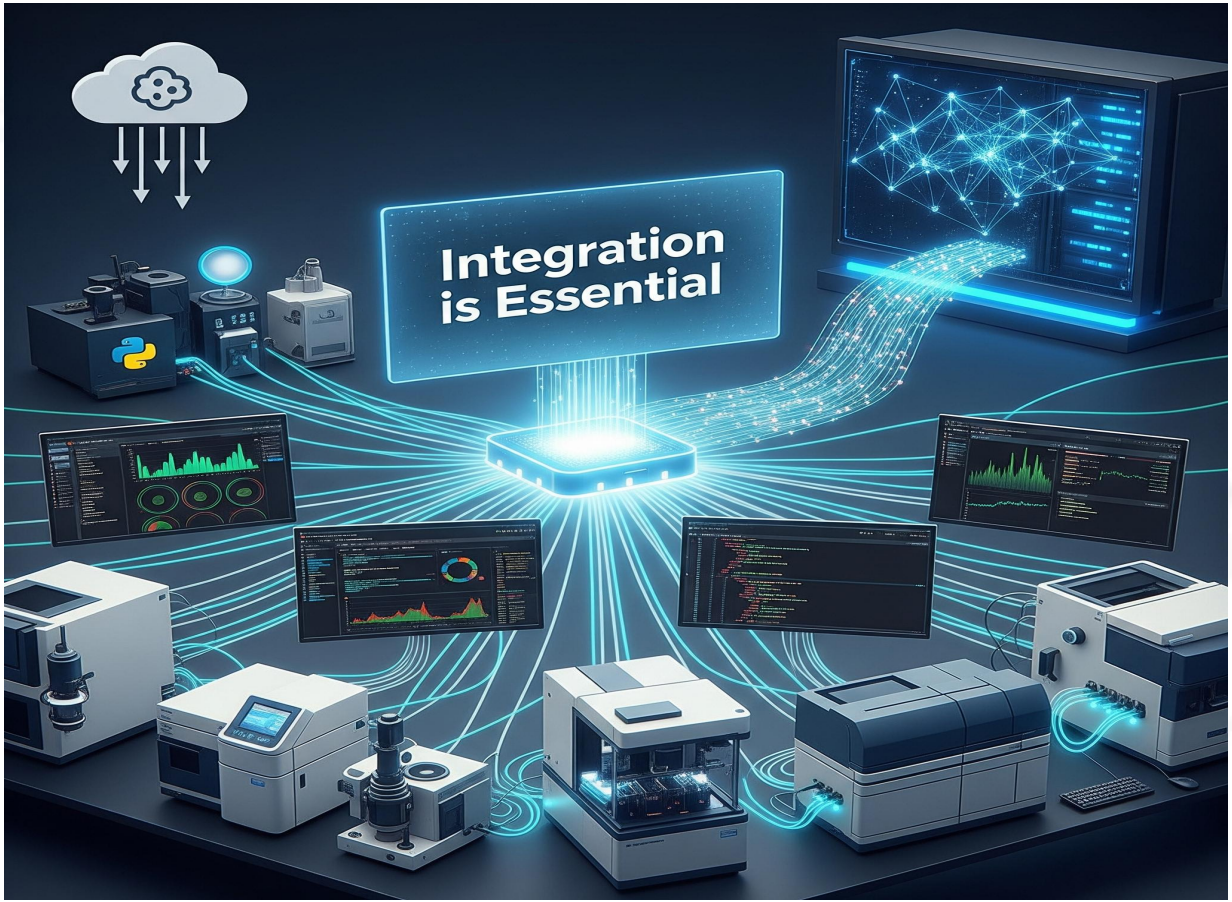
Role-based Permissions

Data Protection

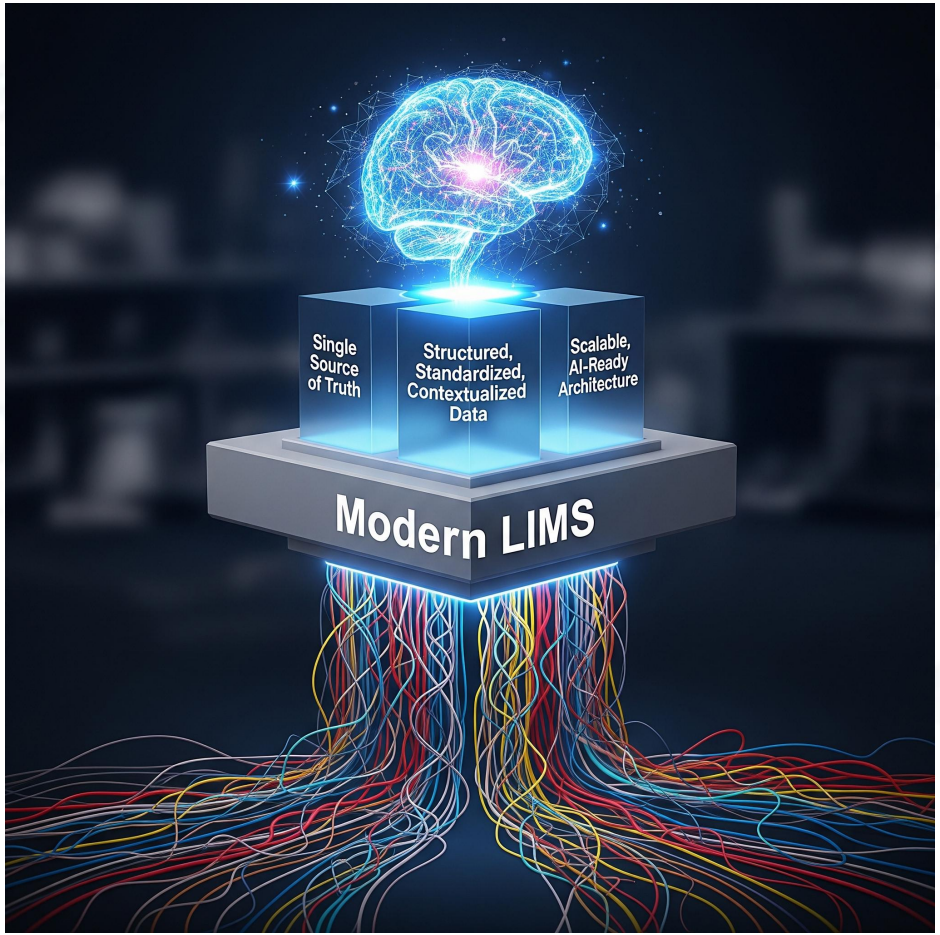
Metadata Provides Context



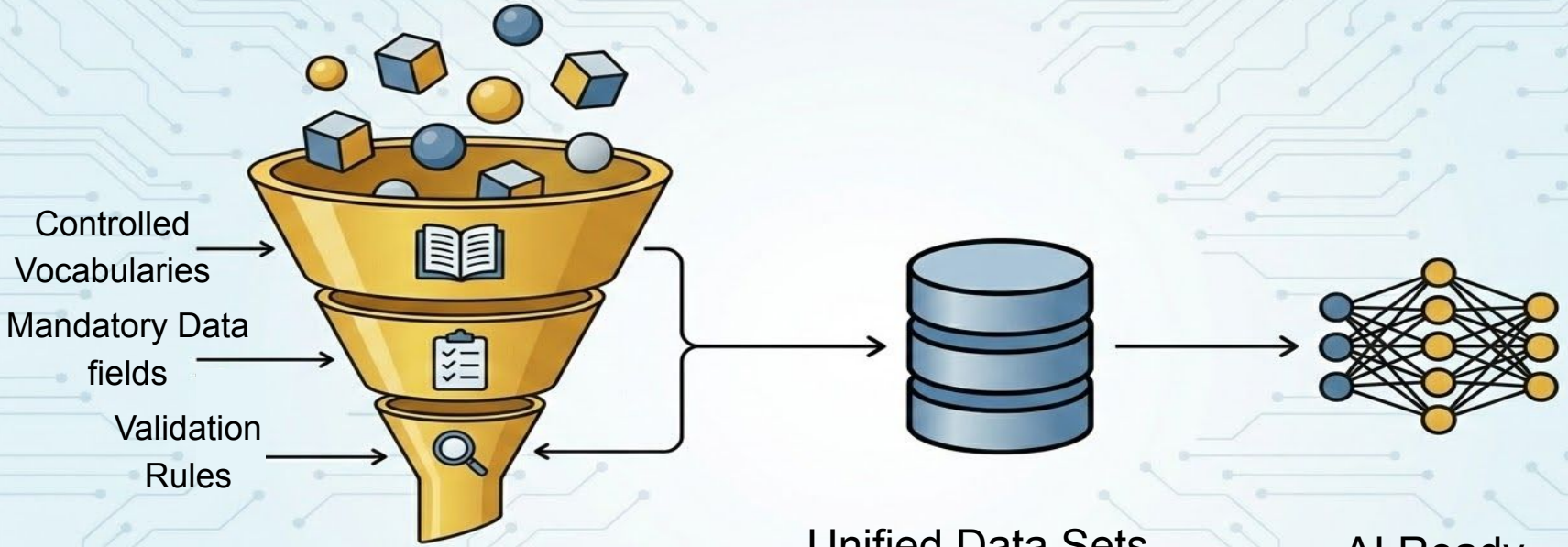
Pillar 5: Integration Is Essential



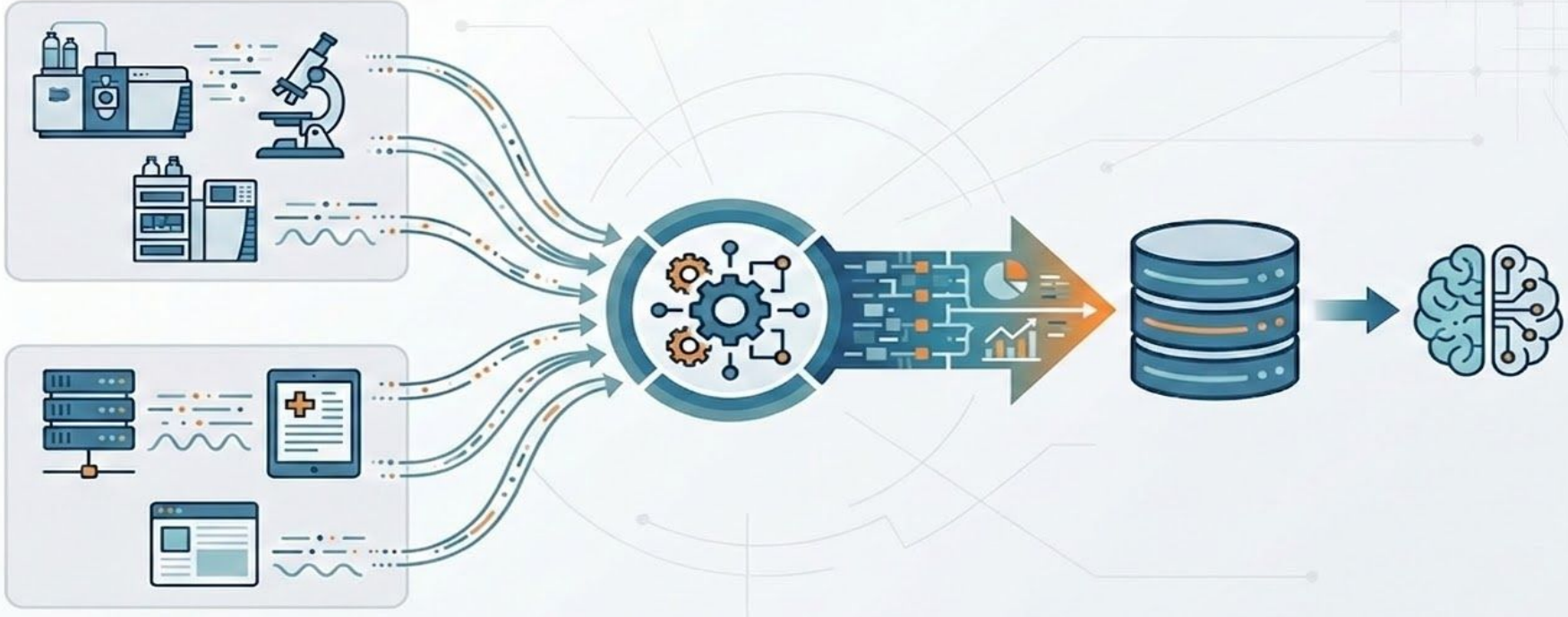
Modern LIMS: The Foundation for AI Adoption



Data Standardization Capabilities



Data Integration Capability



Workflow Automation

Sample Tracking

Result Capture

Report Generation

AI Ready

Traceability and Compliance Support

Audit Trails

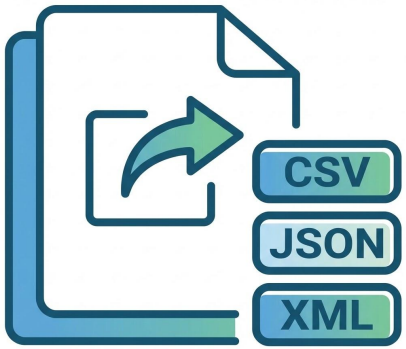
Version History

Regulatory Alignment

Accessibility and Data Retrieval

Structured Search

Historical Data Access



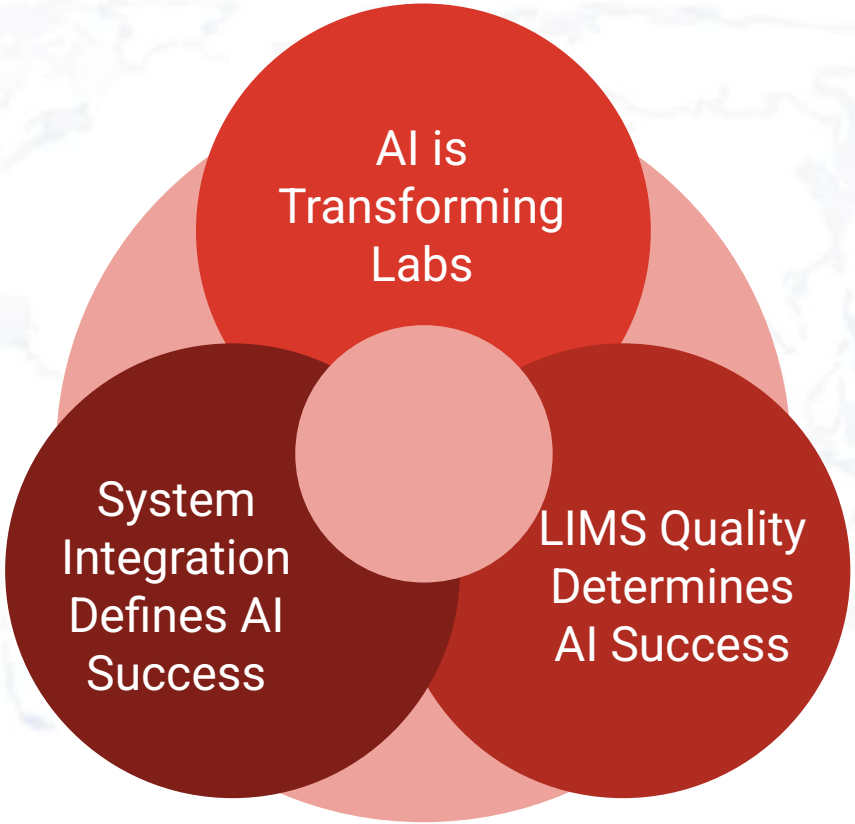
Export-ready Formats

Why Cloud-Hosted LIMS?

A cloud-hosted LIMS:

- Scales data storage, users, and processing capacity as laboratory and AI demands grow
- Delivers regular system enhancements, security patches, and feature improvements without disruption
- Supports modern integrations, APIs, and compute requirements needed for AI and advanced analytics

Closing: What to Take Away



Thank You For Your Attention!

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