Allotrope November Meeting

Richard Milne – Vice President / General Manager

A FAIR Question (pun intended!)

A Question

- How could Thermo Fisher work with Allotrope and other industry collaborators to meaningfully accelerate the delivery of an integrated Lab Operating System?

We need to make meaningful, practical, progress

The world leader in serving science
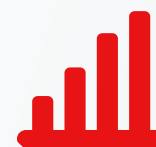
>125,000
Colleagues.

7,000
R&D scientists/engineers.

$1.5B
invested in R&D.

>$40B
in revenue.

4,500
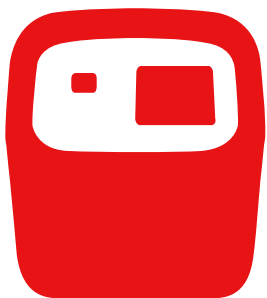Drug Studies through Watson LIMS.

2,500+
Clinical trials conducted by PPD.

1,100+
Large and small molecules manufactured by Patheon.

What we bring to the table

100s
Of Instruments types

Genomics
Proteomics
Flow Cytometry
Imaging
Microscopy
…..

>2.3M
Consumable products

Antibodies
Taqman Assays
Gibco Media
Invitrogen
Fine Chemicals
…..

1000s
Lab equipment products

Freezers
Lab Equipment
Plastics and Glass
Supply Centers
Enterprise Services
…..

>1000
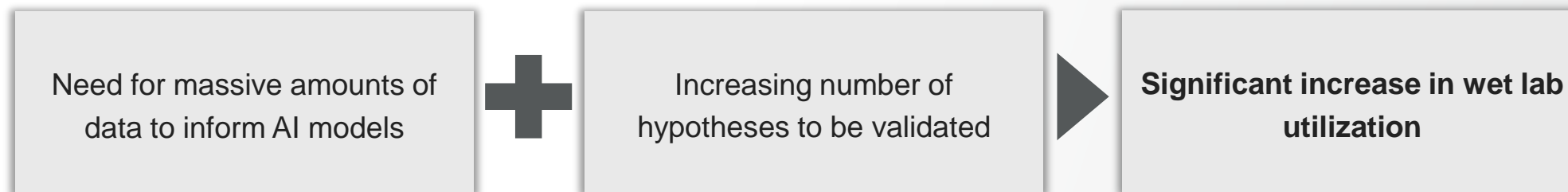Software developers

40% of R&D
10s of Products
35 years experience
Digital Roadmap
Convergence
…..

Scientific processes are evolving…

Yet, the role of the lab remains central

Wet lab experimentation will remain essential…

| Need for massive amounts of data to inform AI models | **+** | Increasing number of hypotheses to be validated | ▶ | **Significant increase in wet lab utilization** |

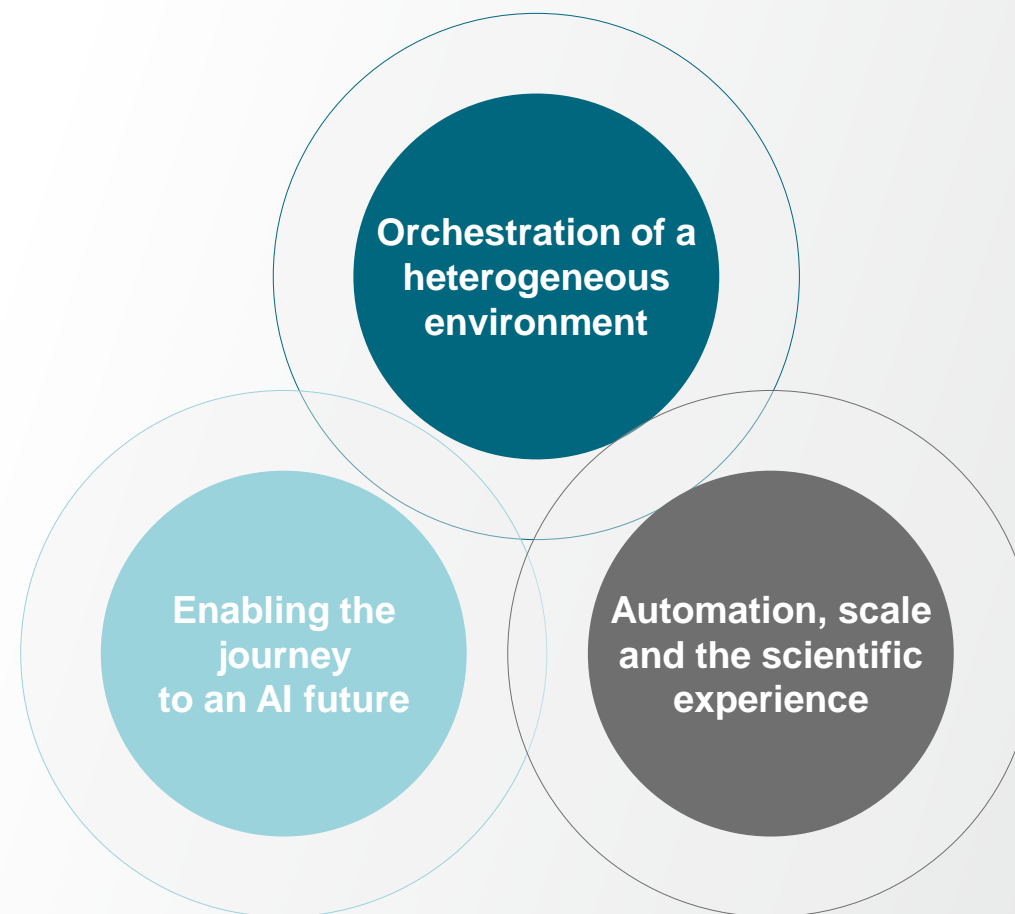**but the wet lab will change with greater need for speed, scale and flexibility**

'99% of AI projects that we see are still fundamentally data management projects'
Usama Fayyad, Executive Director, Institute for Experiential AI, Northeastern University

Three common themes emerge
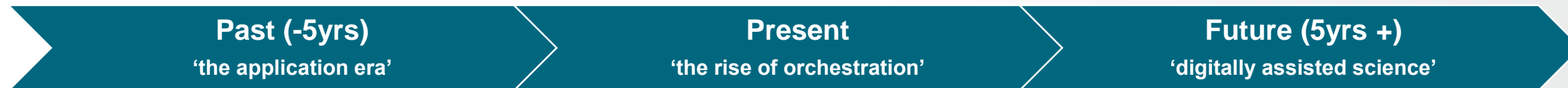
Through our customer engagements

1 Rapidly adopting new data platforms, automation, connected instruments, SaaS and AI… in a complex IT environment.

2 Building custom solutions for connectivity, collaboration, and data integration… but facing cost, maintenance, user experience, and scaled adoption challenges.

3 FAIR data, data reuse, AI and AI-first partnerships on top of everyone's minds…yet continue to have scientists investing far too much time generating value from data.

Orchestration of a heterogeneous environment

Enabling the journey to an AI future

Automation, scale and the scientific experience

'Simplification of the laboratory IT environment to Accelerate Science and Drive Productivity are **priority investment areas over the coming 12-24 months.'**

The future of laboratory digitalization

Will be an evolution

Past (-5yrs)	Present	Future (5yrs +)
'the application era'	**'the rise of orchestration'**	**'digitally assisted science'**

Past (-5yrs)	Present	Future (5yrs +)
• **Stand alone applications**	• **Platform based**	• Flexible deployment options
• Stand alone instrument control	• End-to-end workflows	• **Composable dynamically generated workflows**
• Bespoke integrations	• **Integration frameworks**	• Plug and play integrations
• **Transactional relationships**	• Pre-built integrations with industry leaders	• Integrated ecosystem of domain experts
• Supplier and compliance management	• **Automation ready**	• Interoperability
• **Heavy customization**	• Autonomous Mobile Robots	• **Next Gen Intelligent Robots**
• Lack of standardization	• Applications work 'with' the platform	• Applications work 'on' the Platform
	• **Retained existing core systems**	• **Next Generation LIMS / ELN**
	• Data standardization	• Standardized data ontologies
		• **AI enabled experimental design/troubleshooting**

> *'There is a rat's nest of legacy IT in every lab'*
>
> **Ryan Snyder CIO, Thermo Fisher**

> *'It's clear that we can no longer rely on traditional approaches'*
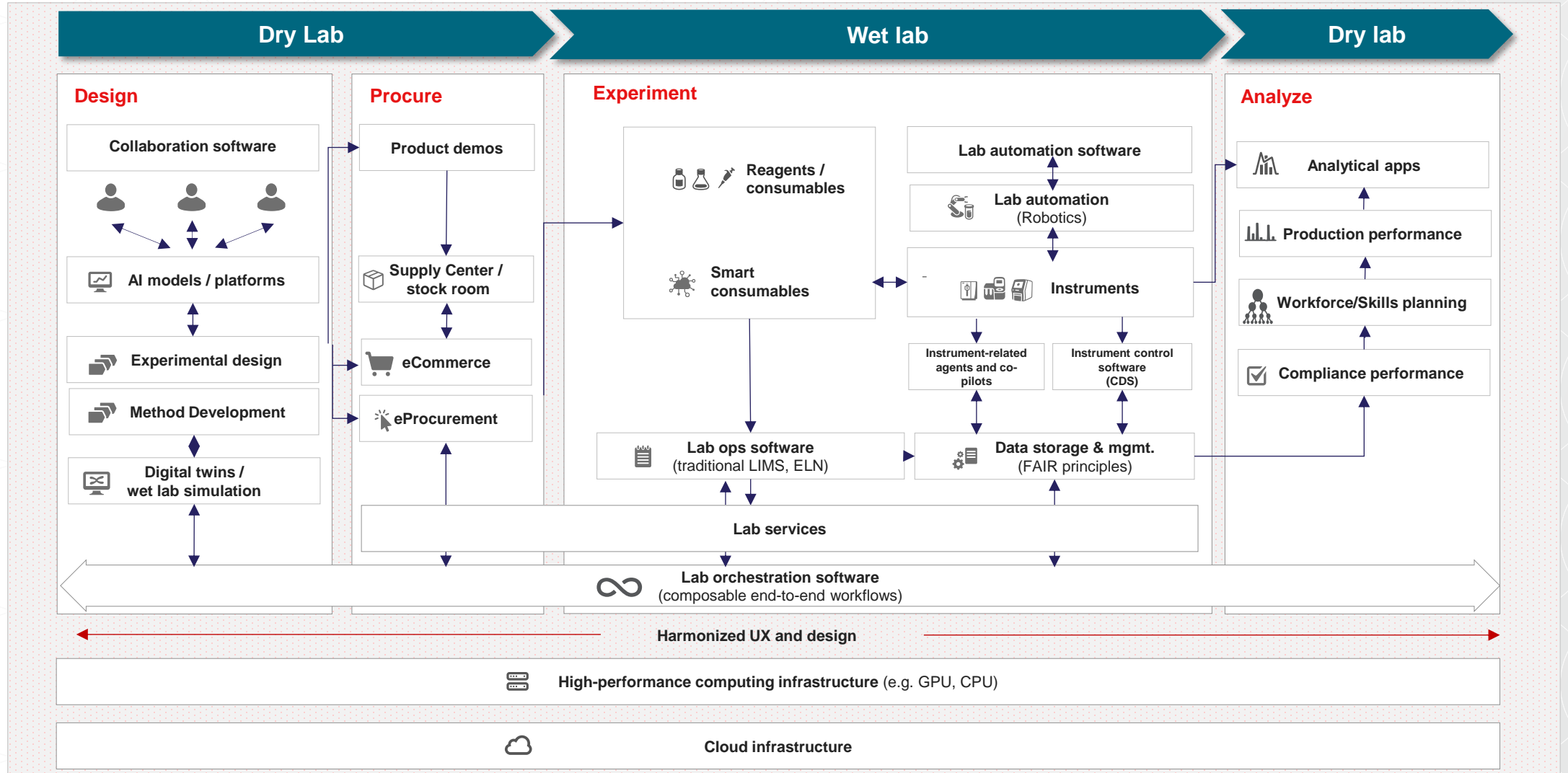>
> **Gino Salituro, Snr Director, Merck**

> *'Tomorrow, with Gen AI's guiding hand, we'll orchestrate a symphony of discovery, where machines, data, and predictions harmonize to unlock scientific possibilities beyond our wildest dreams'*
>
> **Liran Belenzon, CEO, Benchsci**
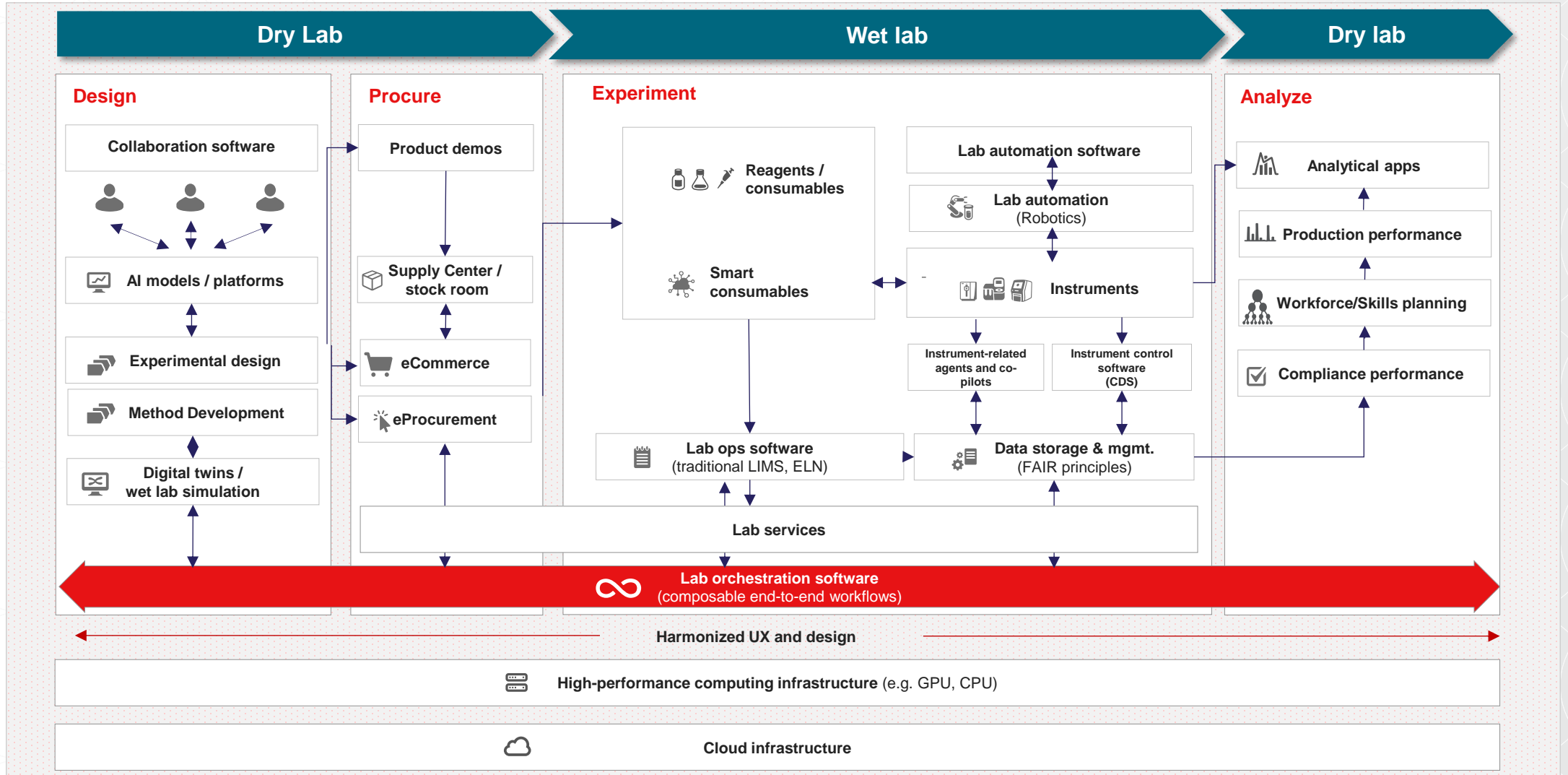
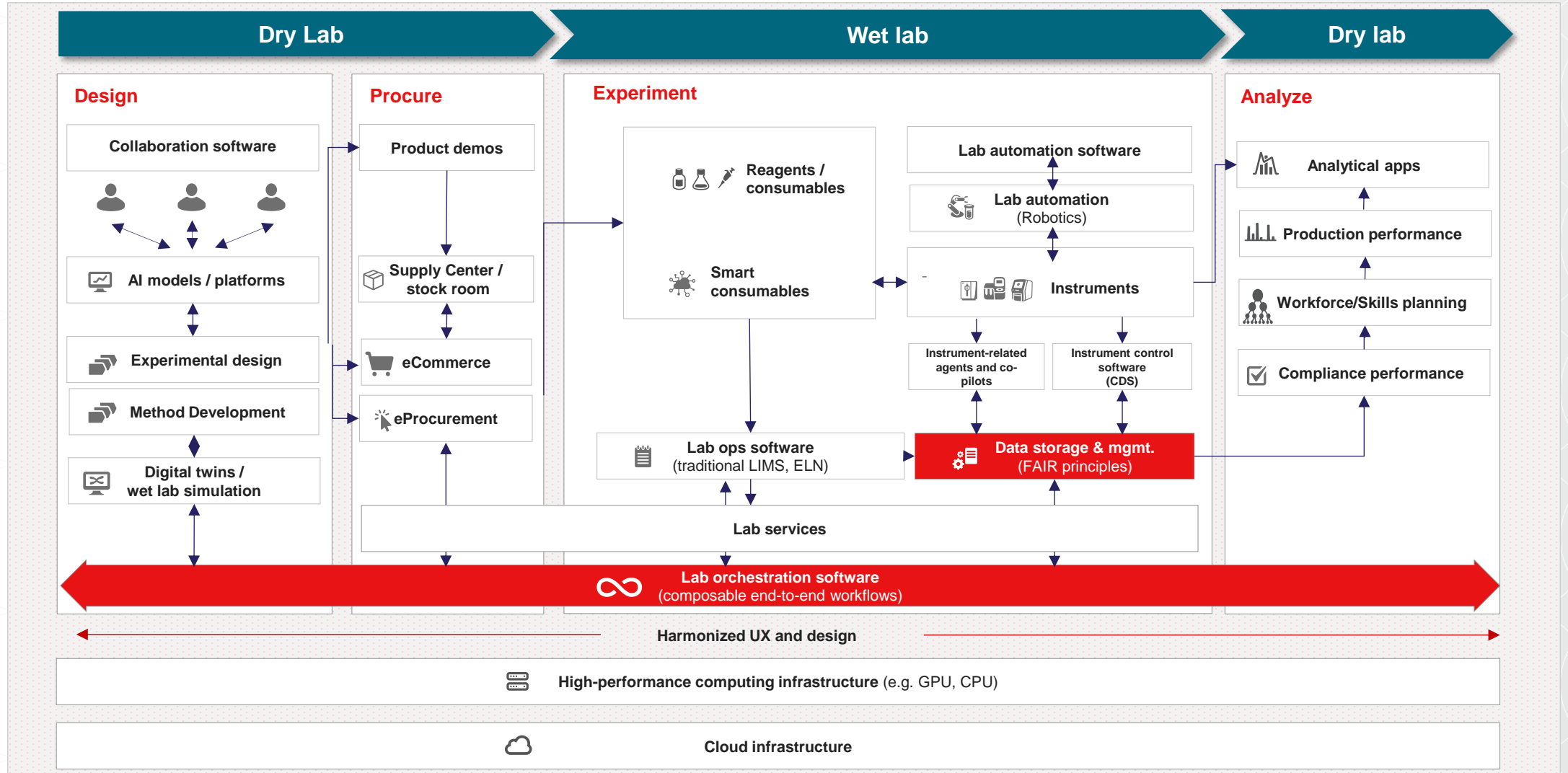# The scope for the 'Lab of the Future'

An illustrative model

Orchestrated workflows

Simplifying across a complex work environment

Proprietary | Communicating the Digital Science Value Proposition | October-2024 © 2024 Thermo Fisher Scientific Inc.

Orchestrated workflows

Simplifying across a complex work environment

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Connect Enterprise V2: Release

November 2024 formal release of Connect Enterprise V2, featuring V1 of the Ai Enablement toolset

Key Features of Connect Enterprise V2.0:

Enhanced User Experience:
-**Streamlined Interface:** Revamped UIs for connections, profiles, and workflows simplify interaction with your data.
- **Platform Header Upgrade:** A refreshed platform header streamlines navigation and improves the overall look and feel.

Security:
-**Connector Management:** Enhanced management of Connectors to update, delete, and manage configurations.
- **Role-Based Access Control (RBAC):** Assign role-based permissions for enhanced security and data governance.
- **Security Enhancements:** Robust security updates keep your data safe and secure.

Automation and Efficiency:
- **Cloud-Agnostic Fission Scripting:** Leverage the power of cloud-agnostic scripting for flexibility in data transformation pipelines.
- **Workflow Management with Versioning:** Easily track, manage, and revert to previous versions of your workflows for seamless control.
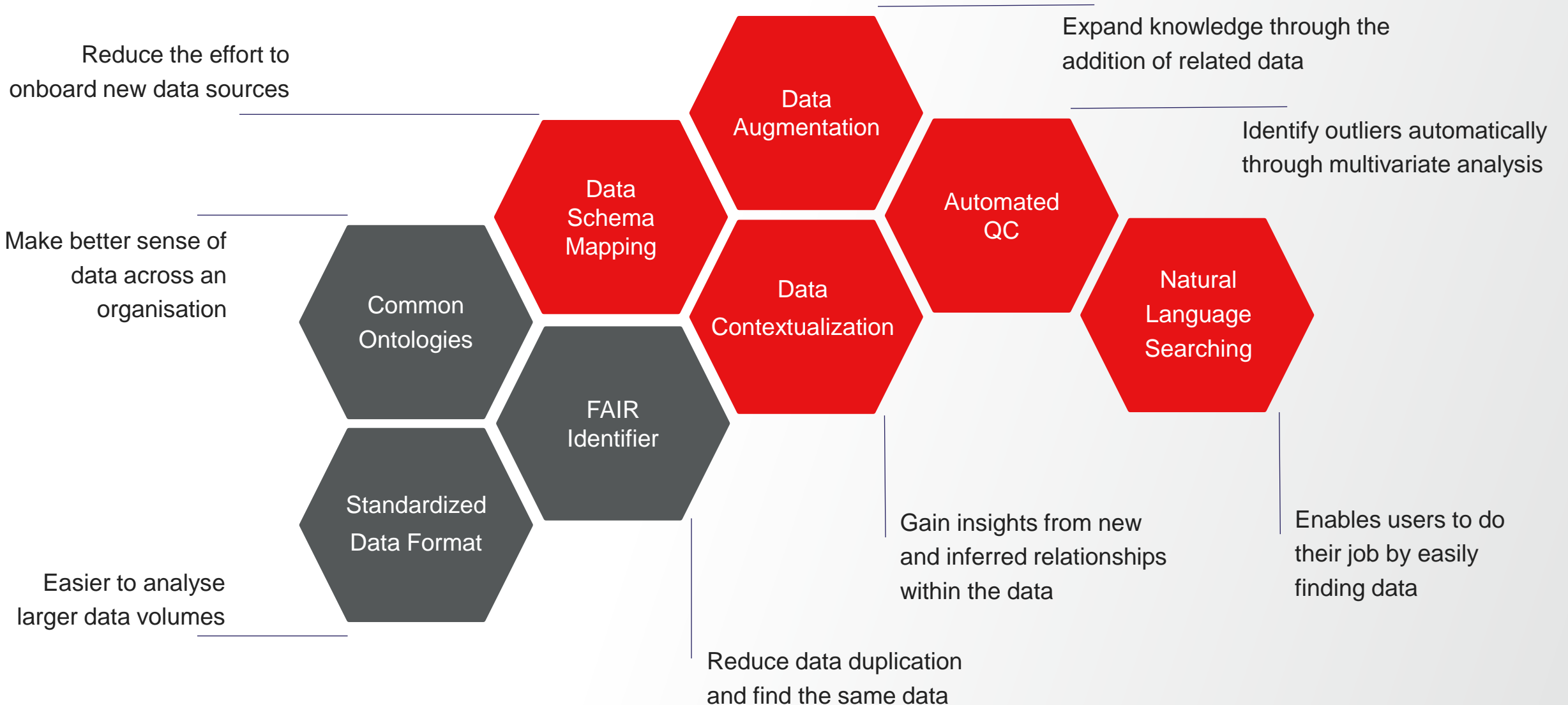
AI Enablement:
- **Analytical Data Store (ADS):** Provides a FAIR data platform for storing scientific data from multiple domains, allowing researchers to query the data using natural language questions. ADS is an add-on designed to help customers gain deeper insights into the data generated by the Connect Platform or external systems.

Additional Features:
- **Improved Audit Trails:** Enhanced audit trails with user IDs provide greater transparency and accountability.
- **Workflow Engine Upgrade:** Take advantage of the latest advancements in workflow automation with the upgrade to Camunda v8.
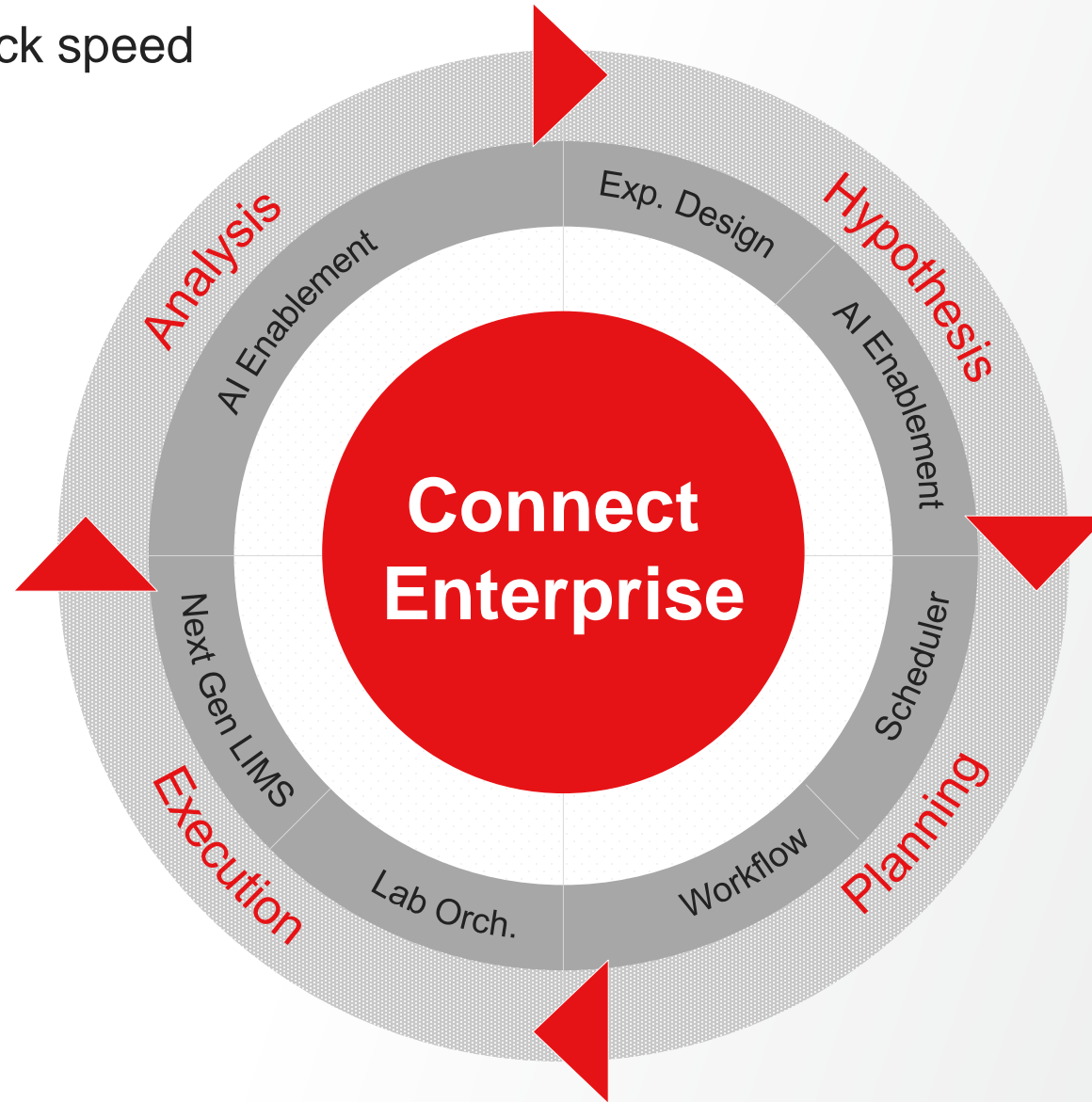
AI Enablement

Laying the data foundations for AI

Reduce the effort to onboard new data sources

Make better sense of data across an organisation

Common Ontologies

Data Schema Mapping

Data Augmentation

Expand knowledge through the addition of related data

Automated QC

Identify outliers automatically through multivariate analysis

Data Contextualization

Natural Language Searching

FAIR Identifier

Standardized Data Format

Easier to analyse larger data volumes

Reduce data duplication and find the same data

Gain insights from new and inferred relationships within the data

Enables users to do their job by easily finding data

A digital vision of an end-to-end solution

We need to change the clock speed

A Question

- How could Thermo Fisher work with Allotrope and other industry collaborators to meaningfully accelerate the delivery of an integrated Lab Operating System?

We need to increase the momentum and separate the signal from the noise to make impactful progress
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Thank you