

Transforming R&D with Digital Intelligence: Past, Present, and Future

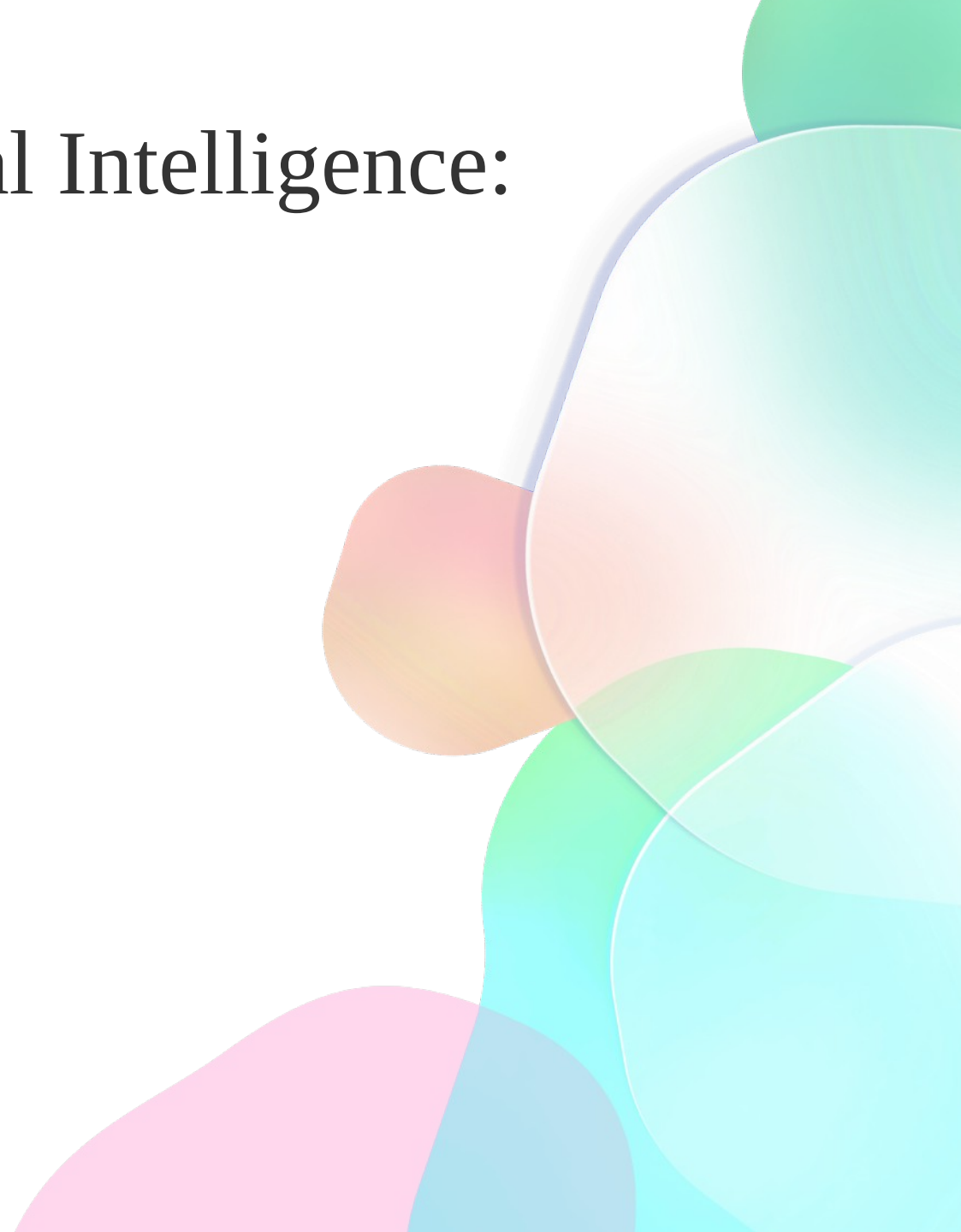
NextGen Chemicals & Petrochemicals Summit 2025

Presenter:

Dr. Manish M. Khandagale | Sr. Application Scientist

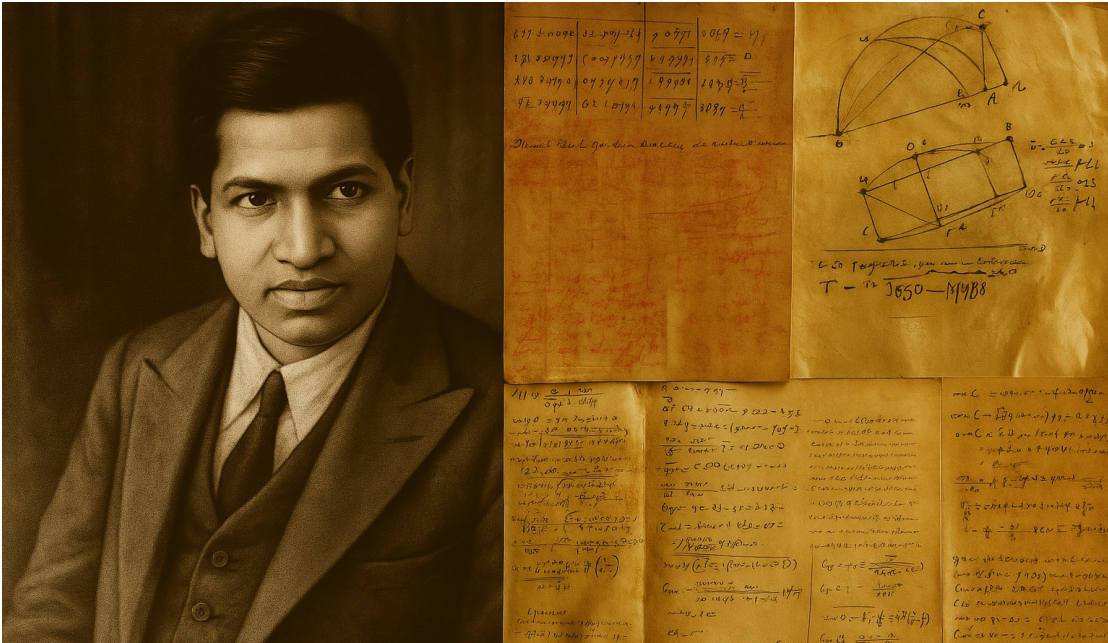
revvity
signals

June 18, 2025



Lessons From History: Lost Opportunities Without Insights

Brilliance, unshared and lost in pages.



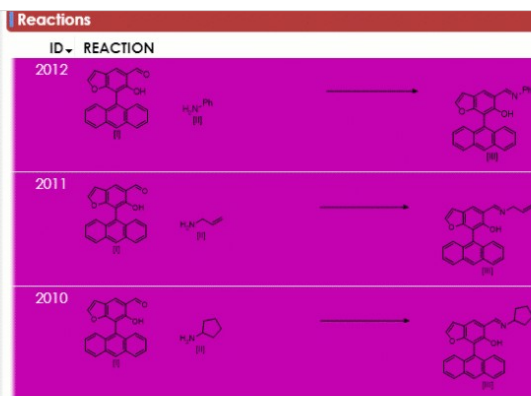
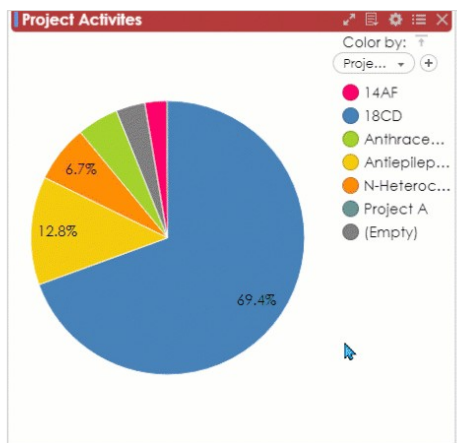
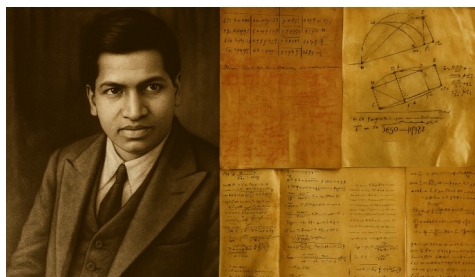
Knowledge Management
Capture It Right, Use It Forever



Capture It Right, Use It Forever: Legible, structured, and searchable data is essential for preserving and building on scientific knowledge.

Enabling Knowledge Reuse and Operational Insight in R&D

Has a similar reaction or molecule been developed in-house? What conditions were used?



Reaction KPIs

SEC...	PRODUCT	MW	YIELD	ATOM ECON	E FACTOR
2012	(E)-7-(anthracen-9-yl)-5-((p...	413.467	84 %	96 %	0.228
2011	(E)-5-((allylimino)methyl)-7-(...	377.435	77 %	95 %	0.347
2010	(E)-7-(anthracen-9-yl)-5-((c...	405.488	89 %	96 %	0.157

Experiment Conditions

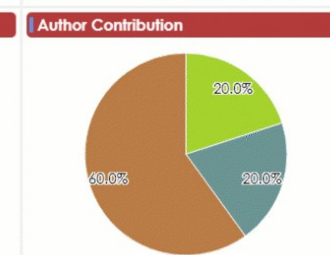
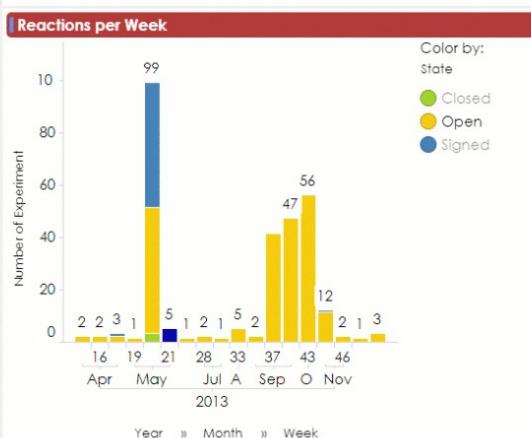
PROJECT NAME	REACTION MOLA...	TEMPERATURE	REACTION TIME
18CD	0.100 molar	75 °C	24 hr
18CD	0.100 molar	75 °C	24 hr
18CD	0.100 molar	75 °C	24 hr

How do different variables impact performance and process greenness?



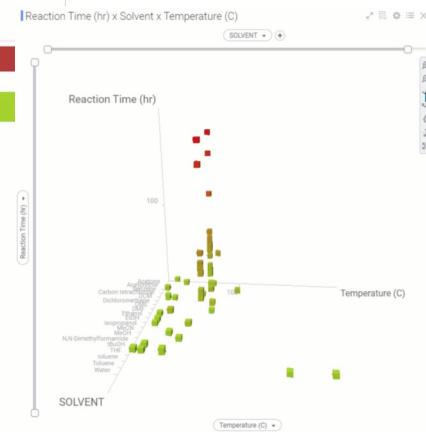
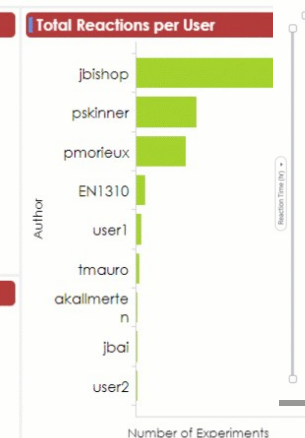
Author: Select a Project for Author details

EXPERIMENT TITLE	STATE	MODIFIED DATE
Ethylene Polymerization	Open	11/6/2...
Ethylene Polymerization	Open	11/6/2...
Ethylene Polymerization	Open	11/6/2...
Ethylene Polymerization	Open	11/6/2...
Ethylene Polymerization	Open	11/4/2...
Ethylene Polymerization	Open	11/4/2...
Chromium Catalyst Design ...	Open	10/24/...
Chromium Catalyst Design ...	Open	10/24/...
Chromium Catalyst Design ...	Open	10/24/...
Chromium Catalyst Design ...	Open	10/24/...



Experiments Created per Author

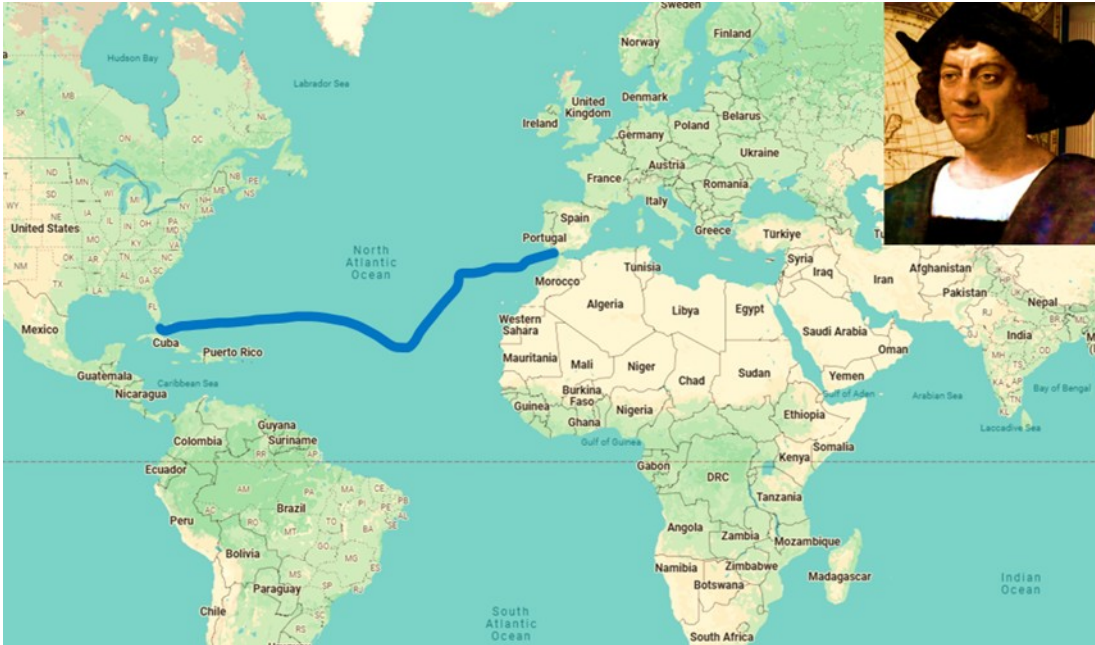
Author	Experim...	Top 3
jbishop	160	●
pskin...	58	●
pmori...	48	●
EN1310	8	
user1	5	



Which scientists or teams are currently overloaded or underutilized?

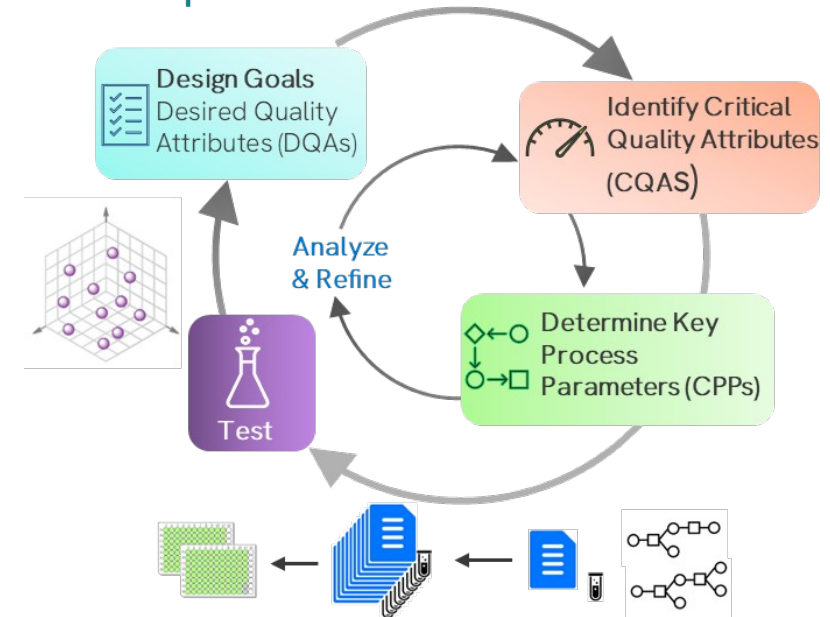
Lessons From History: Lost Opportunities Without Insights

Success by Serendipity, Not Strategy



Data-driven Strategy

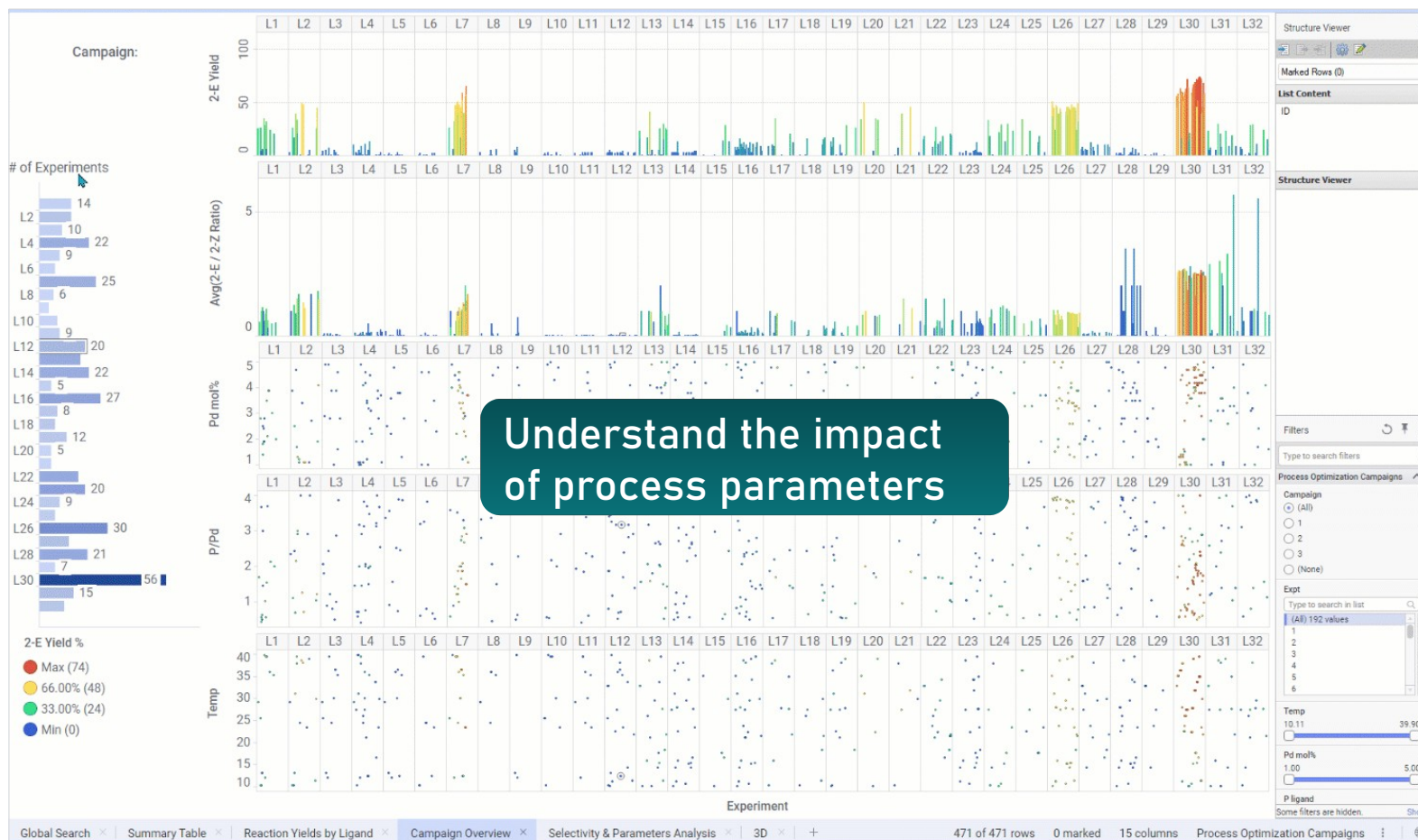
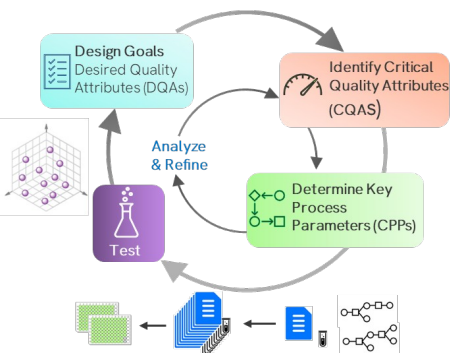
Data-Driven Hypothesis Is the Modern Compass



Data-Driven Hypothesis Is the Modern Compass: Modern R&D needs data-driven hypotheses, not guesswork or chance discovery.

Navigating Design Space & Accelerating Execution Through Data-Insights

Gain a unified, interactive view of results from hundreds of experiments across multiple campaigns



Variables:

- No. of ligands screened: 32,
- P/Pd ratio: 0.5 – 4.0 ratio,
- Catalyst loading: 1.0 – 5.0
- Reaction temp: 10 – 40 °C

Lessons From History: Lost Opportunities Without Insights

Gold Prospector – The Unscalable Success



Digital Lens for Scalability

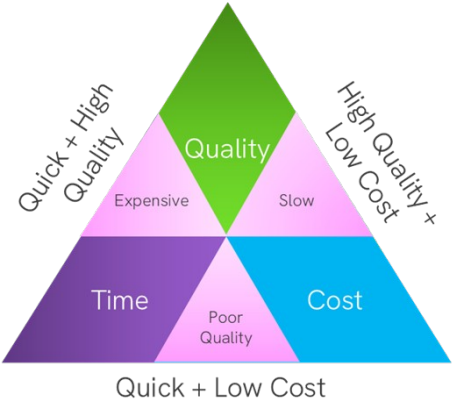
Informed Trade-offs Drive Scalability



Knowledge Fuels Value & Scale: Without understanding and insight, even the greatest discoveries can slip away unused.

Turning Batch Data into Business Decisions

What are the compositions of different batches?

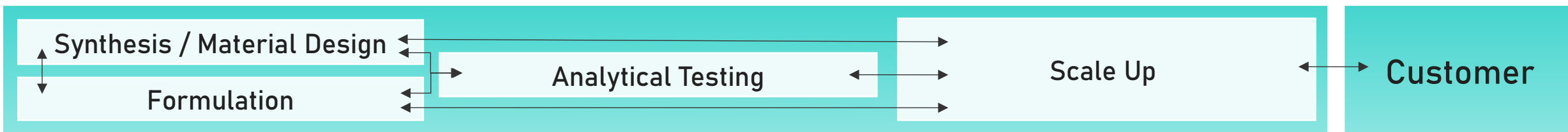


what are the trade-offs in cost or quality?

Which batches deliver similar performance to the

The Next-gen Laboratory Informatics Platform: All Your Data, All-in-one

New Product Development R&D Workflow



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Management

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Management

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AI-Readiness

R&D
Workflow
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APIs & Systems Integration

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20**

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Employees

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Customers

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20**

Agrochemical Companies

Markets

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- Specialty Chemicals
- Food
- Flavor & Fragrance
- Agrochemical
- Consumer Products





“History reminds us that brilliance isn’t enough — it must be captured, scaled, and shared. With the right digital partner, you don’t just transform your lab — sustainable growth.

Let’s build that future — together



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