Timothy Gardner, CEO

Presentation to:
National Academy of Sciences Workshop
Advanced and Automated Workflows
17 March 2020

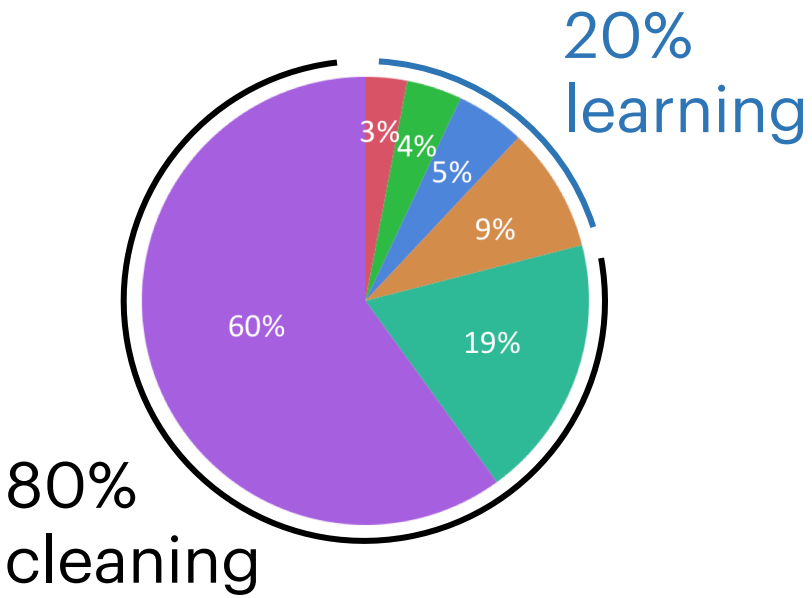
Riffyn®
Discover More

A mission to make science work better

Helping companies shorten R&D cycle times &
increase operational effectiveness

by delivering integrated process data
that's always ready for machine learning

Researchers spend 80% of their analysis time cleaning and organizing data, instead of learning from it...



How Data Scientists Spend Their Time:

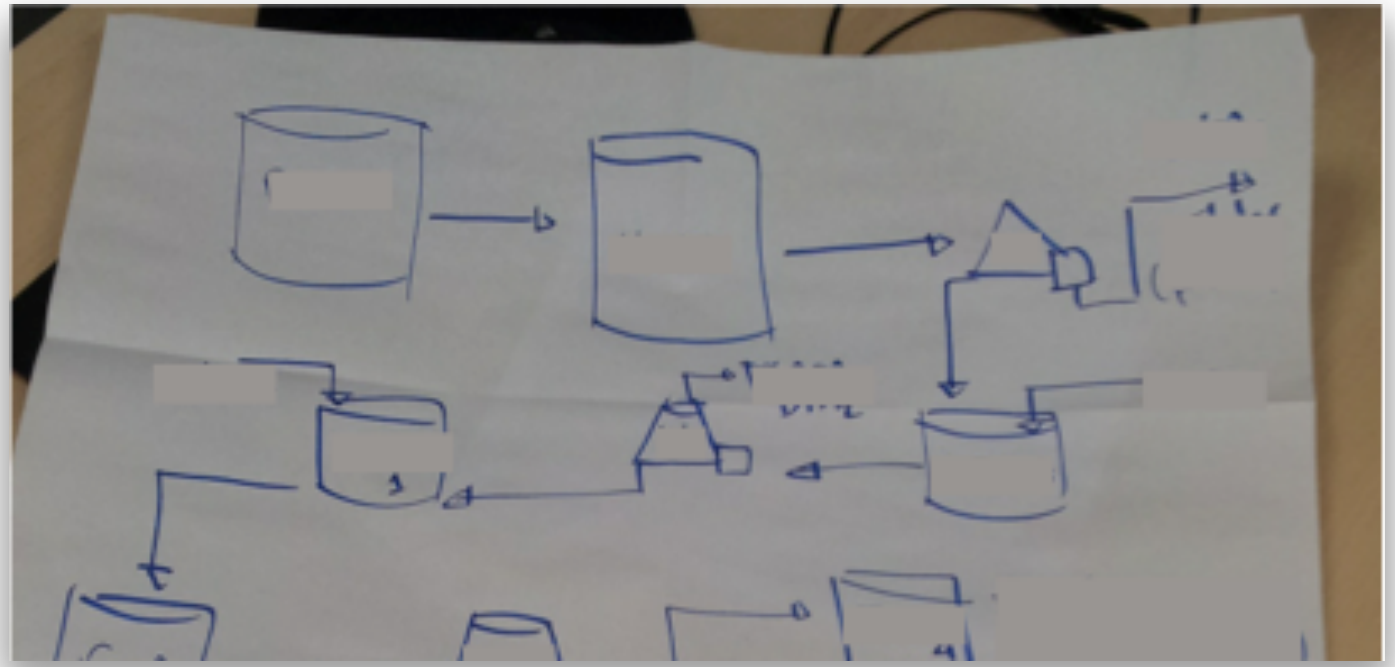
- Cleaning and organizing data: 60%
- Collecting data sets: 19%
- Mining data for patterns: 9%
- Refining algorithms: 4%
- Building training sets: 3%
- Other: 5%

*Data from survey of ~80 data scientists conducted by CrowdFlower

"It takes us 2-3 months to integrate data from a single development batch"

- Scientist, Top 20 Pharma Company

A primary cause of the problem appeared in my inbox in 2012

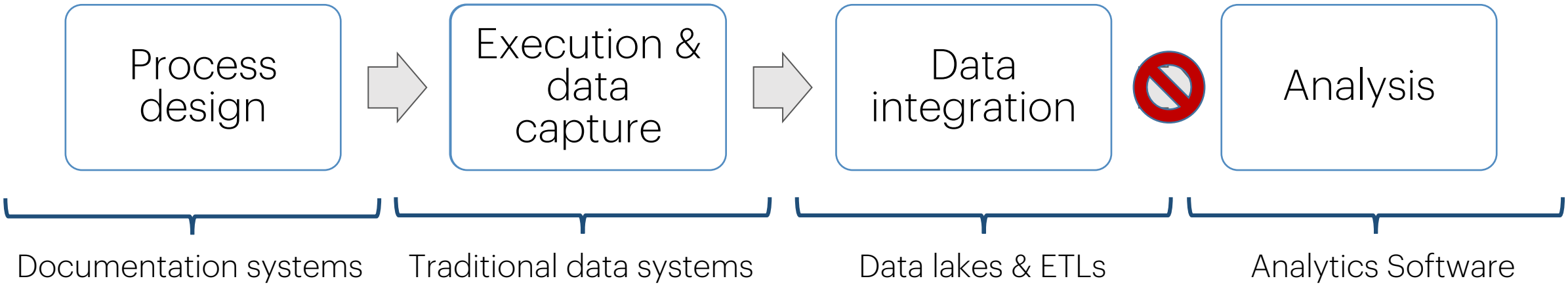


The problem

Invisible R&D and production processes result in waste, delays, missed product opportunities.

Processes are invisible because design and data systems cannot keep pace with the rapid iterations of process development.

Traditional data systems only capture data which results in data silos and barriers to meaningful data analytics



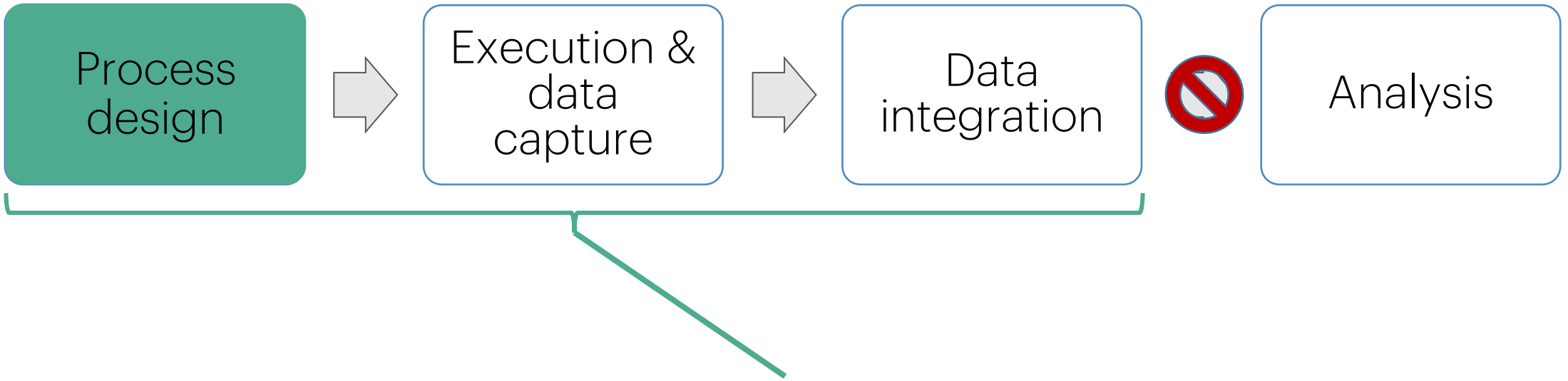
Results in data silos that

lack context and interoperability
are inflexible
demand heavy manual data integration

Data analytics and process improvement suffer

Root cause of the pain

Traditional data systems only capture data, resulting in ad-hoc solutions to full scientific lifecycle



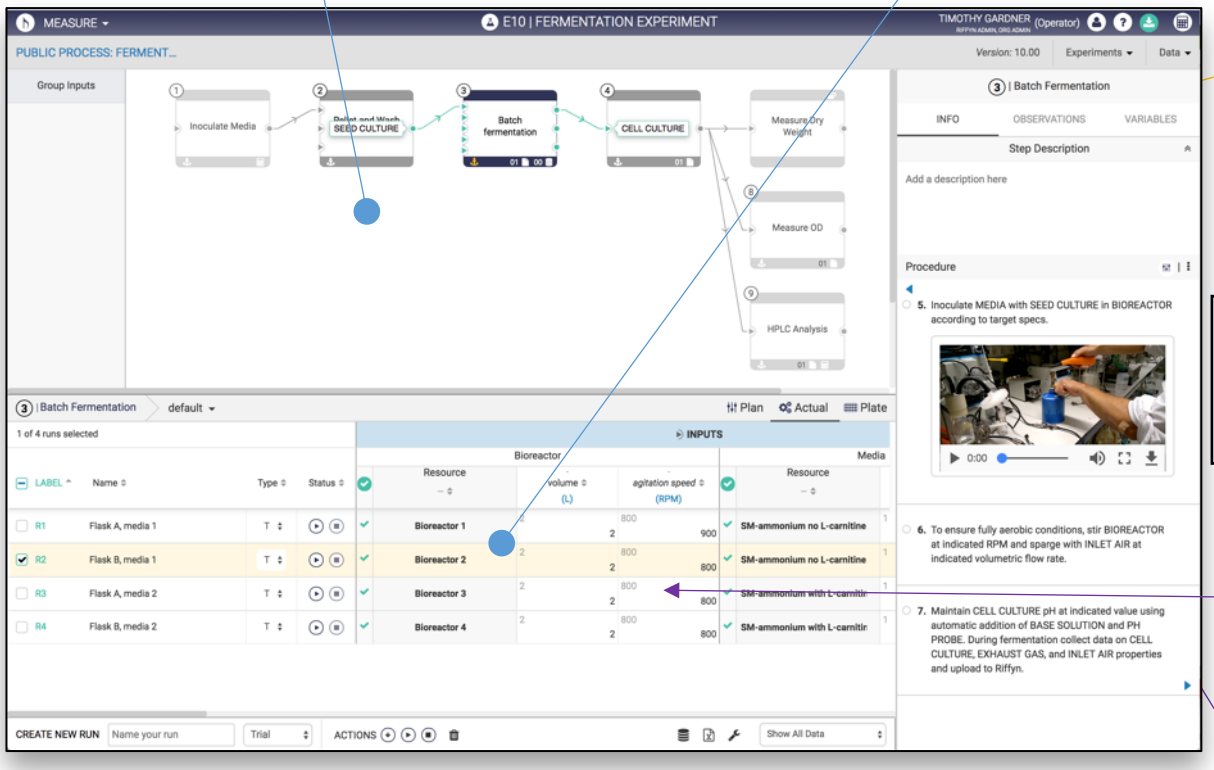
To solve the data analytics problem,
you need to solve this problem

It starts with process and workflow

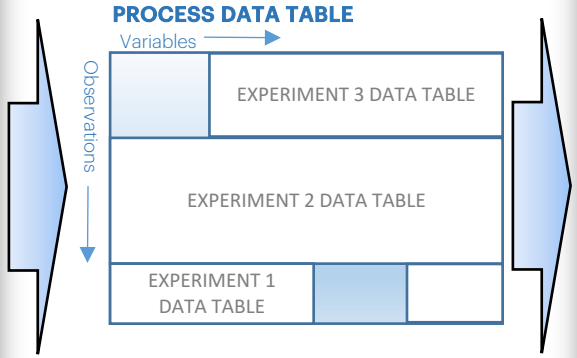
Riffyn SDE – Process Data System

Delivers integrated data with context in real-time for visualization & machine learning

Process design → Execution & data capture → Data integration → Analysis

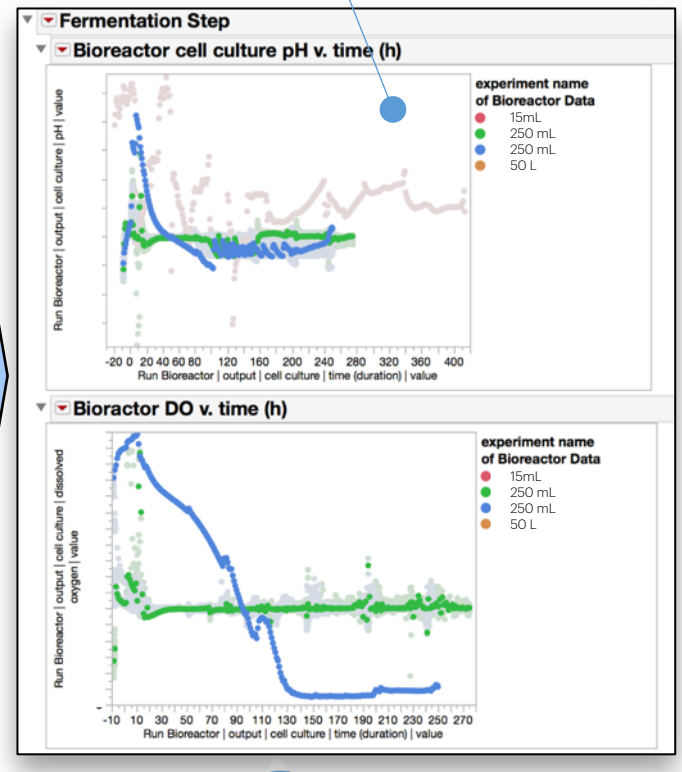


Change rationale



Batches & Samples with time-series

Video-enhanced work instructions



Excel | ELN | Historian | LIMS | Scripts

Traditional data silos consumed & contextualized by Riffyn SDE

jmp R python tableau Spotfire TIBCO Software KNIME

Case Study – Yeast Strain Development & Scale-up @ Novozymes

Novozymes sought to develop advanced yeast strains for consolidated bioprocessing

Where: 2 R&D sites collaborating across 3000 miles

Approach: Re-engineered their R&D process to accelerate product development using

- Riffyn SDE
- Advanced lab automation
- New analytics pipeline

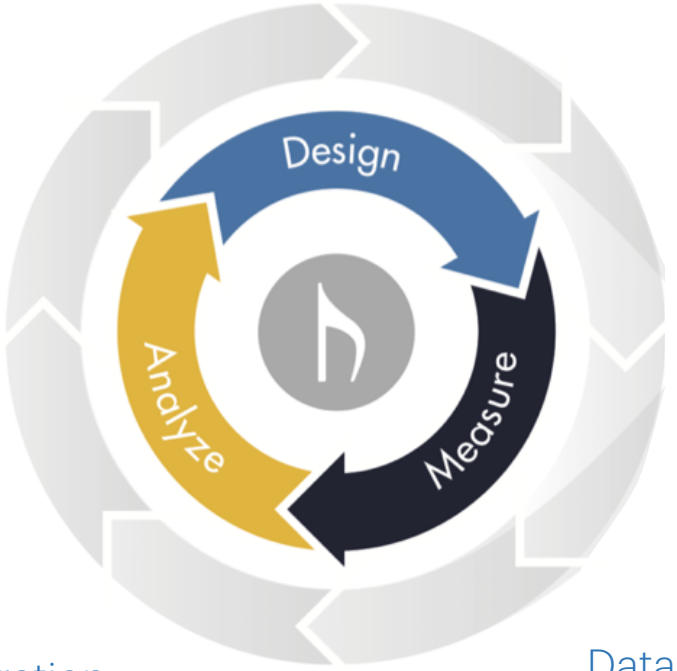
Riffyn @ novozymes

Novozymes advanced R&D processes drove rapid yeast strain improvement
Enabled by lab automation, Riffyn SDE data system and analytics pipeline

Digitalized learning cycle…

Process / experiment design & improvement (Riffyn SDE)

Analytics (Novozymes data lake & analytics)

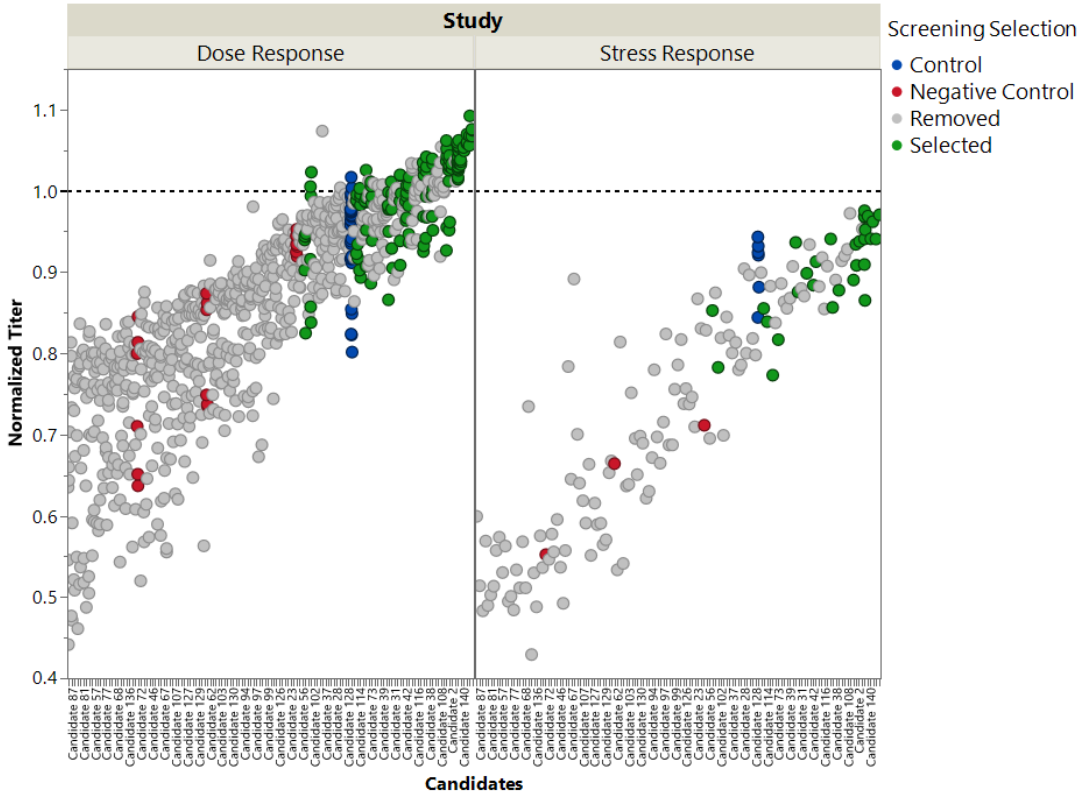


Lab automation (Novozymes)

Data integration (Riffyn SDE)

Data capture (Riffyn SDE)

…delivered exceptional speed and magnitude of strain improvements



Riffyn @ novozymes

Impact to Novozymes
Advanced Yeast Biofuels Product Development

- Order of magnitude increase in strain screening throughput
- Cut time-to-market & personnel effort by 50%
- 4 breakthrough strains to market in 18 months

Riffyn @ novozymes