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meet the modern lab™

Transforming Lab Connectivity to Leverage Data Value

Allotrope Connect

November 20, 2024

Boston, MA

The current laboratory IT topology

Many lab assets, all with unique interfaces

ELN's

LIMS's

Simple Devices

Chromatography systems

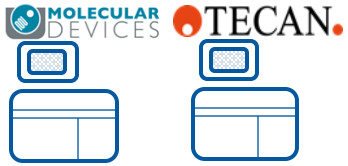


Plate readers

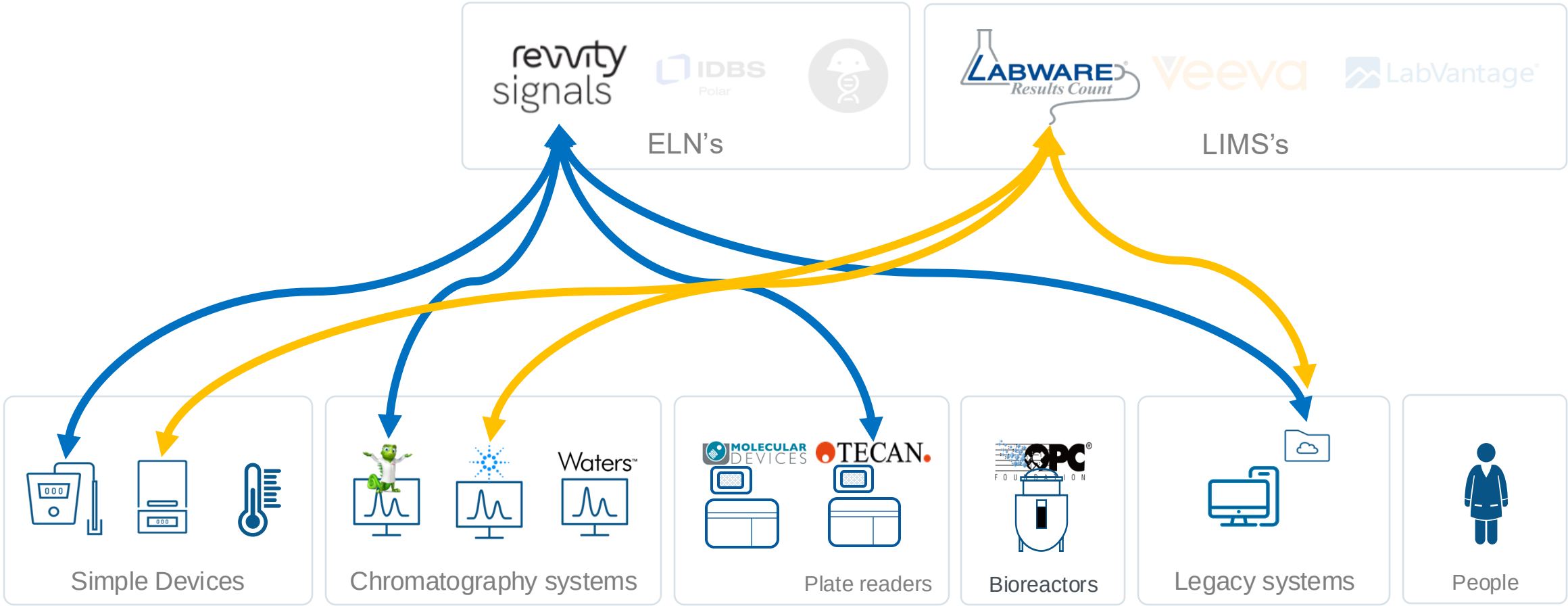
Bioreactors

Legacy systems

People

The current laboratory IT topology

Point-to-point integrations have significant limitations



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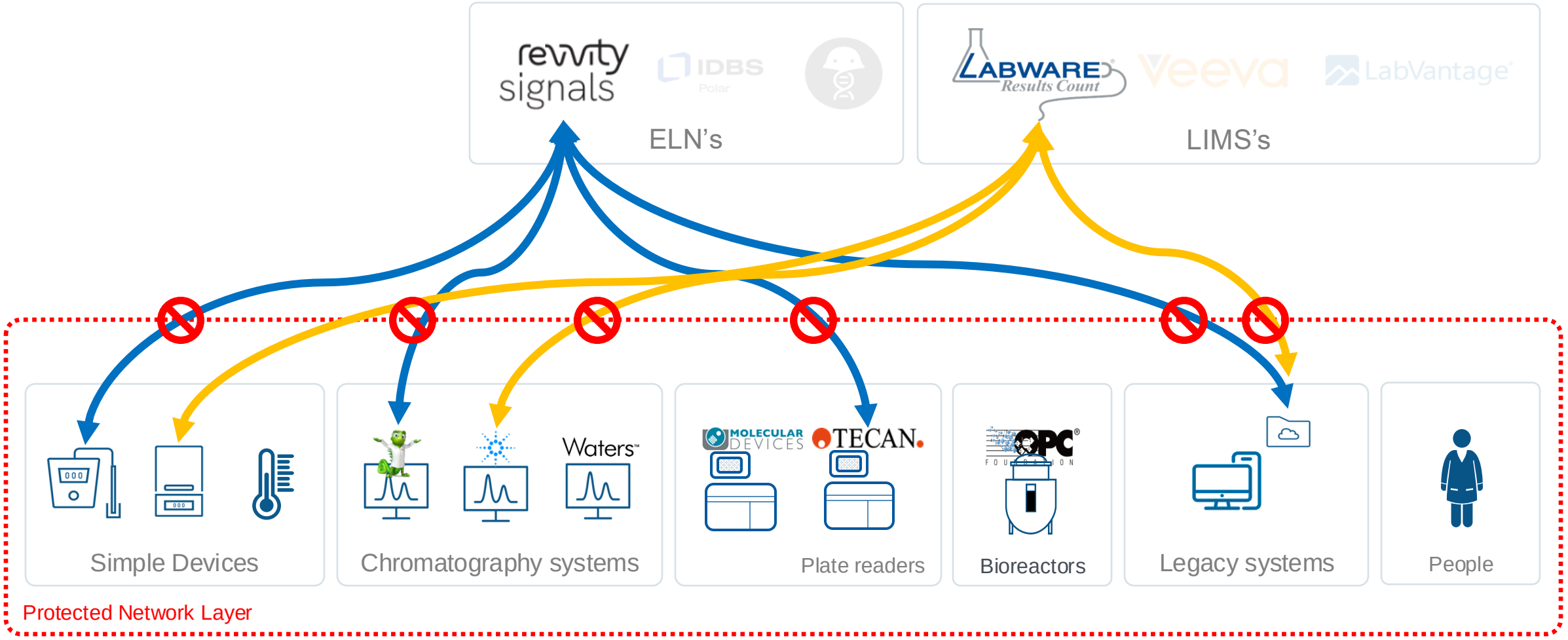

The

Point-t

- No unified control plane
- No uniform data structure
- Each controlling system requires unique expertise/training to maintain automations/integrations
- No consistent solution to connect on-prem instruments/devices to cloud applications
- Lab IT exist as separate, disconnected network

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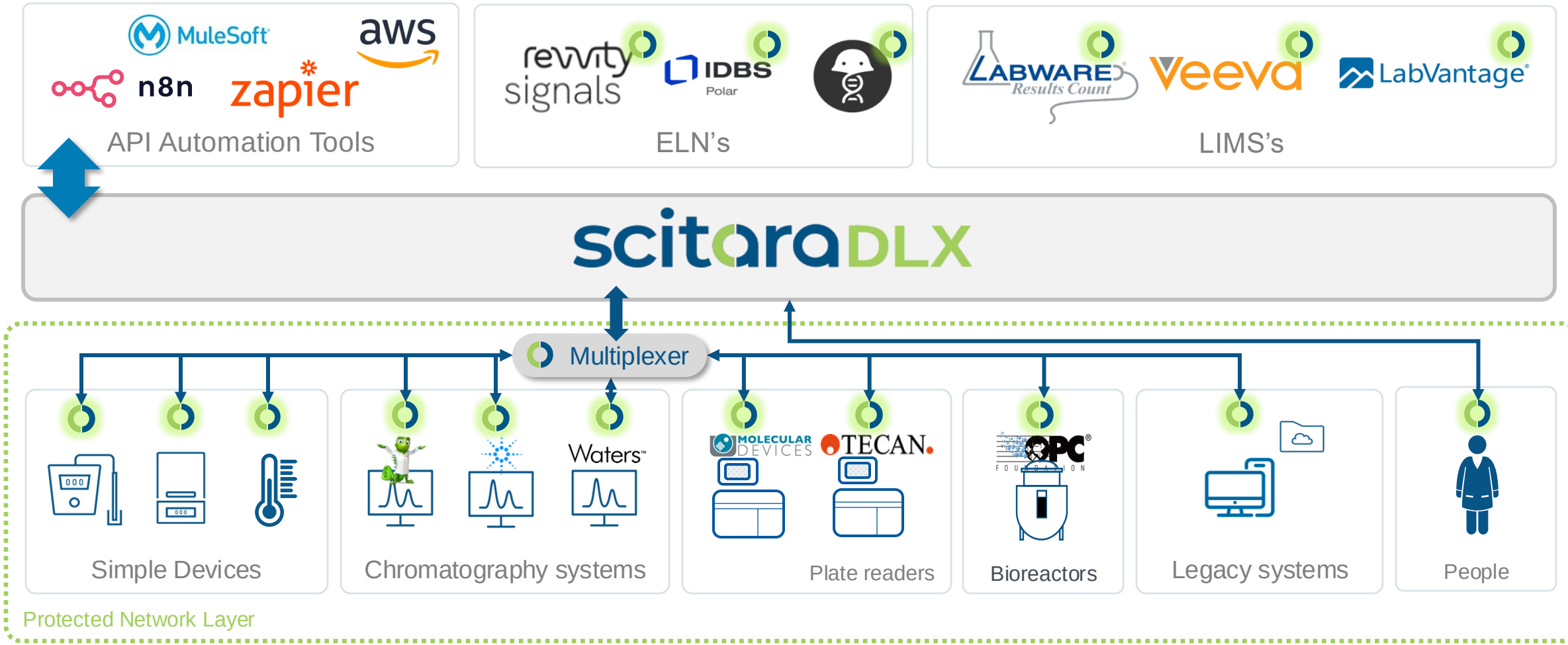
Using DLX to create a Lab Digital Core

Implementing a unified, modern connectivity and automation solution



Using DLX to create a Lab Digital Core

Implementing a unified, modern connectivity and automation solution

Released

DLX Orchestrations

scitara DLX

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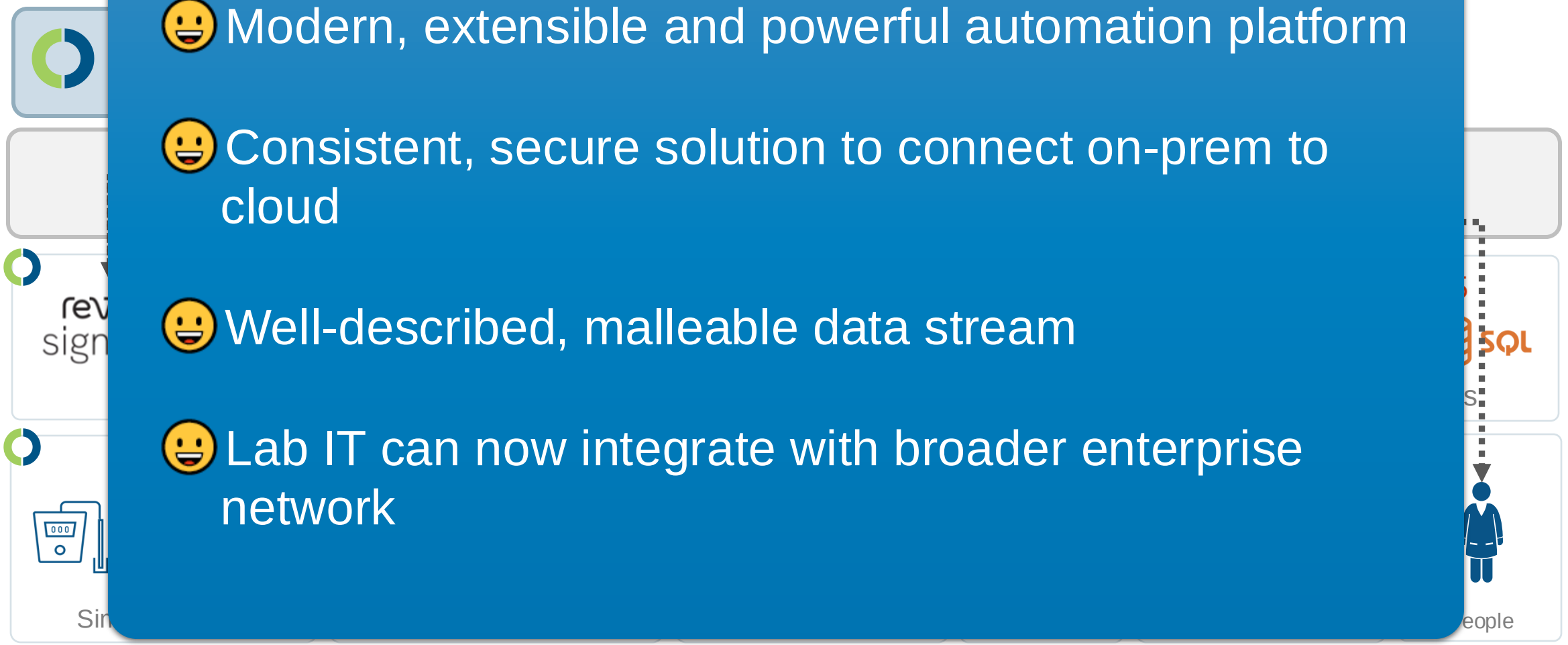
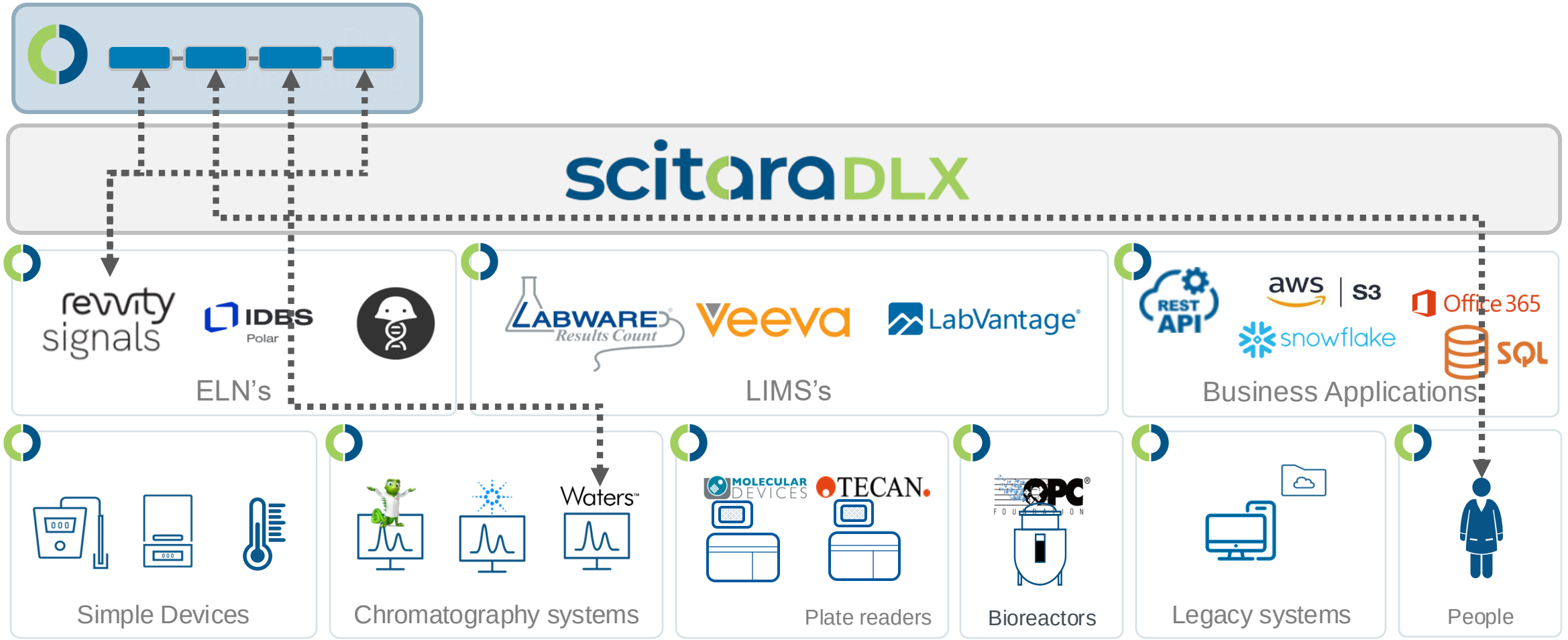
- Unified, accessible control plane
- Modern, extensible and powerful automation platform
- Consistent, secure solution to connect on-prem to cloud
- Well-described, malleable data stream
- Lab IT can now integrate with broader enterprise network



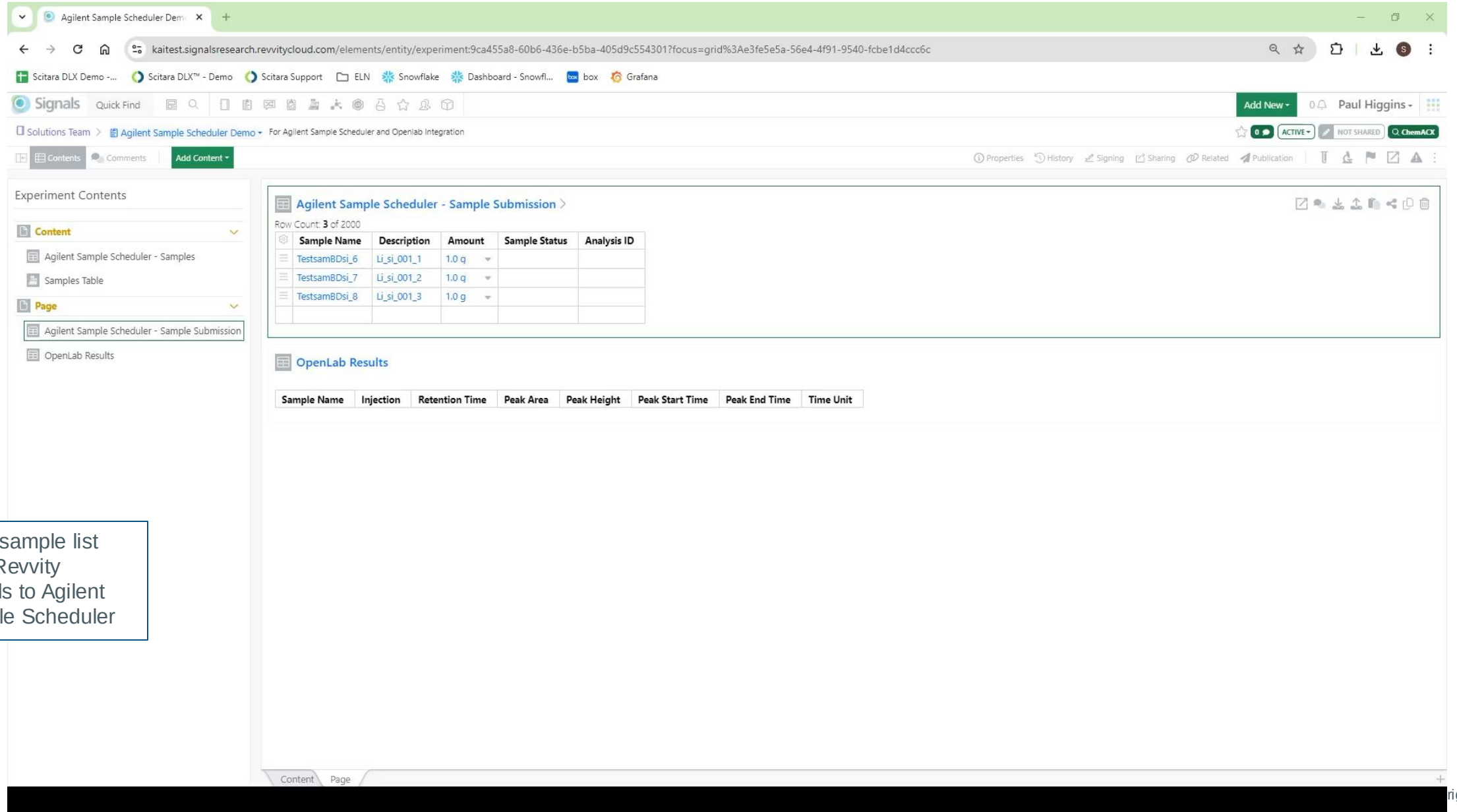
DLX FAIR Data Stream

Establish transactional platform value



Scitara DLX Example – Revvity Signals – Agilent OpenLab

https://youtu.be/KiSzHmtySeU



Send sample list from Revvity Signals to Agilent Sample Scheduler

Scitara DLX Example – Revvity Signals – Agilent OpenLab

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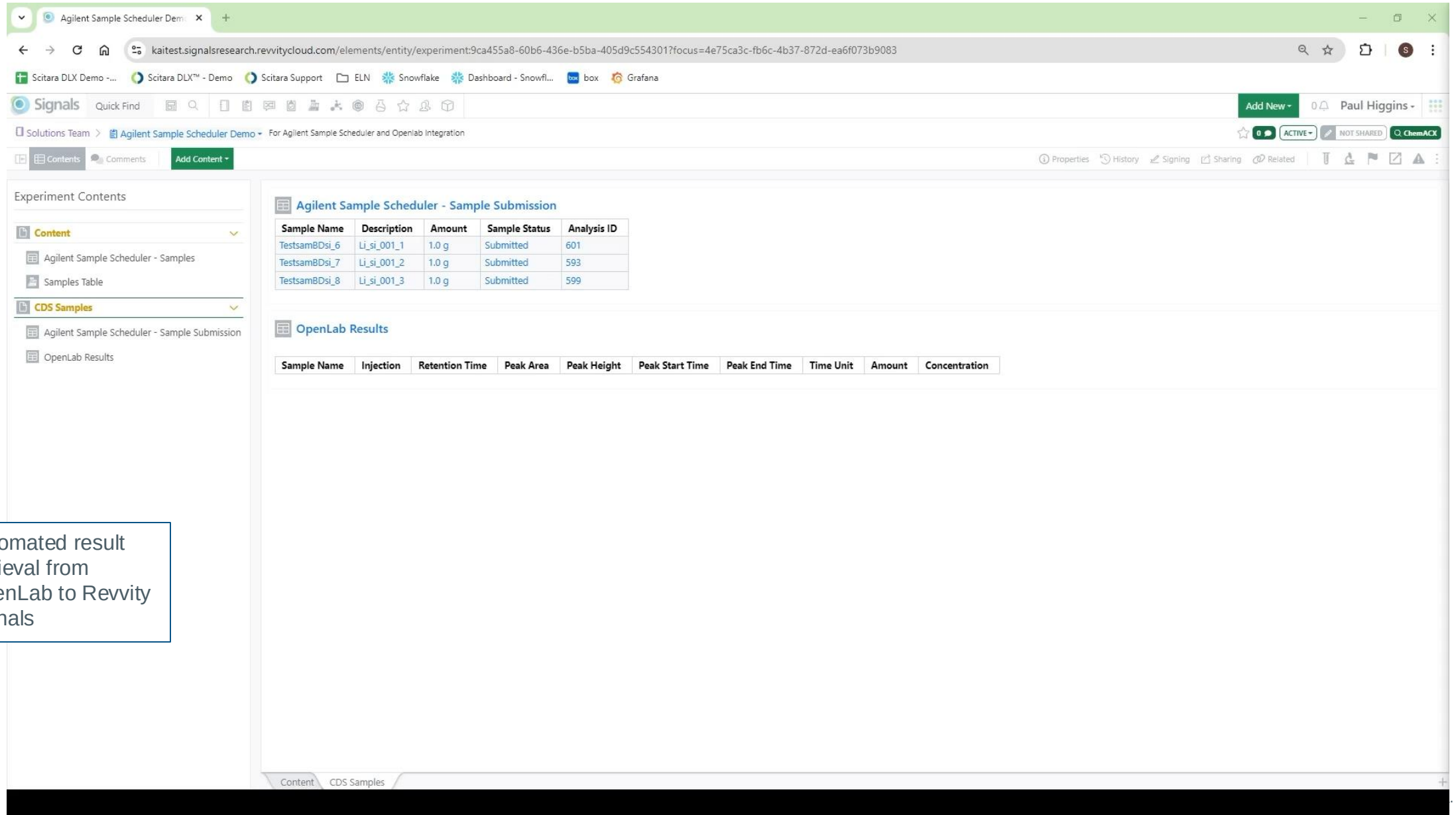
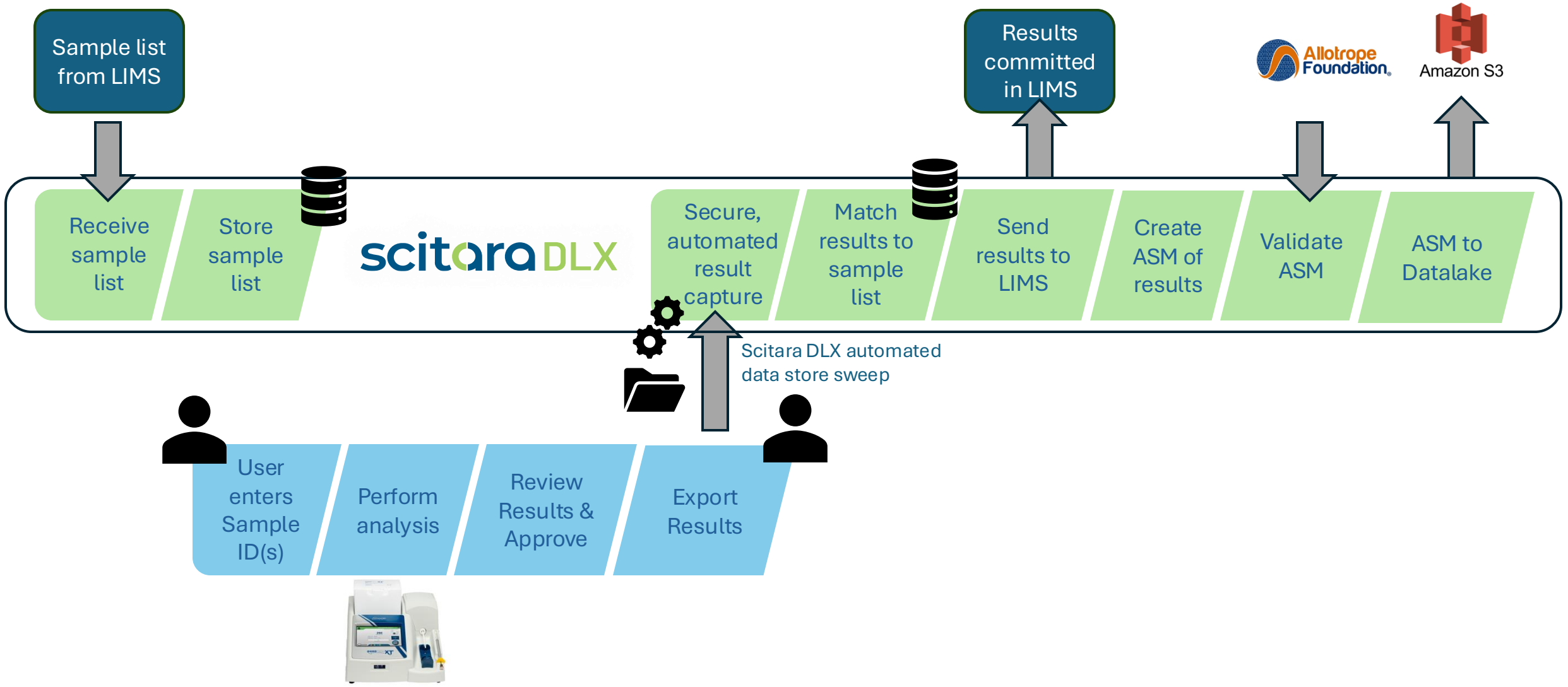
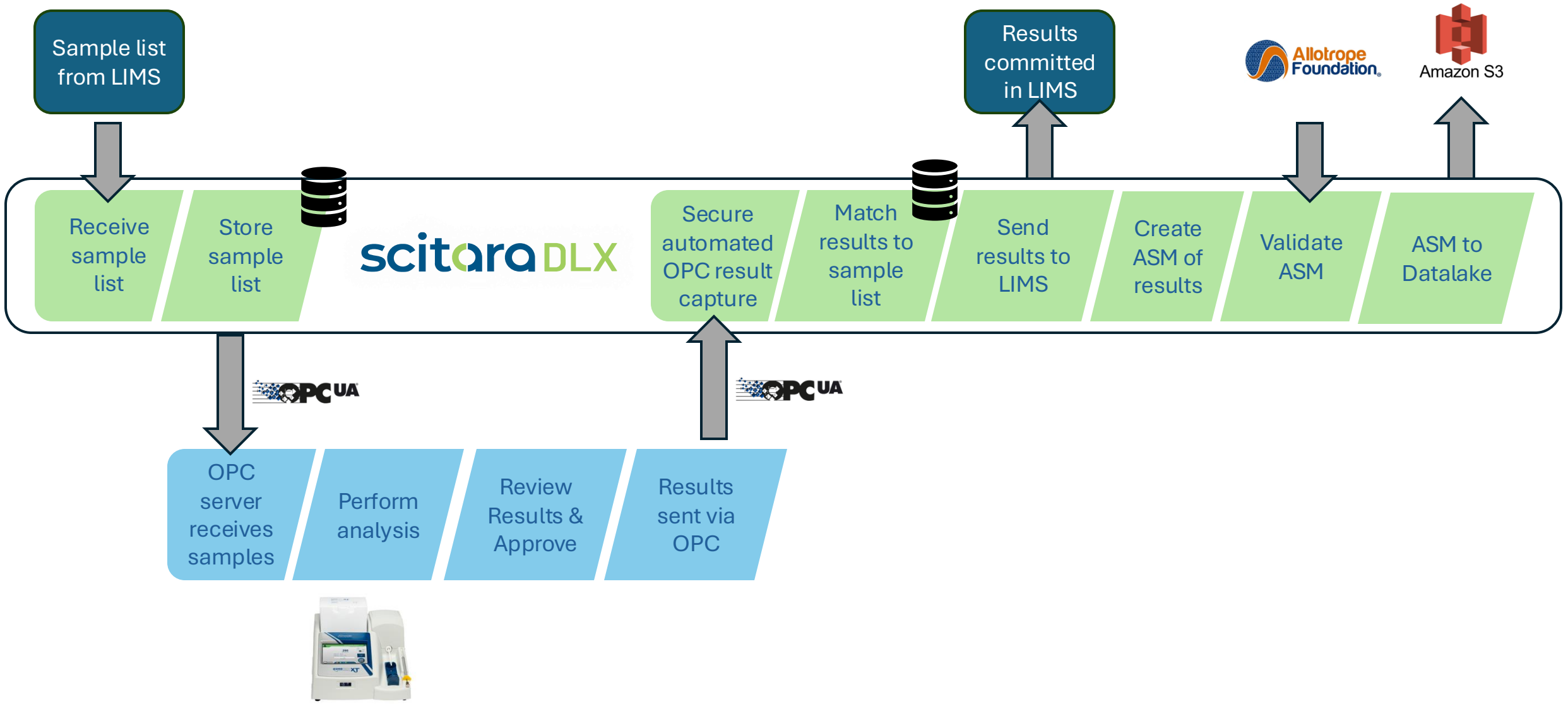


Automated result retrieval from OpenLab to Revvity Signals


Sample list from LIMS
Receive sample list
Store sample list
scitara DLX
Secure, automated result capture
Match results to sample list
Send results to LIMS
Results committed in LIMS
Create ASM of results
Validate ASM
Allotrope Foundation
Amazon S3
ASM to Datalake
Scitara DLX automated data store sweep
User enters Sample ID(s)
Perform analysis
Review Results & Approve
Export Results


Sample list from LIMS
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scitara DLX
Secure automated OPC result capture
Match results to sample list
Send results to LIMS
Results committed in LIMS
Create ASM of results
Validate ASM
Allotrope Foundation
Amazon S3
ASM to Datalake
OPC UA
OPC UA
OPC server receives samples
Perform analysis
Review Results & Approve
Results sent via OPC

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DLX FAIR Data Stream

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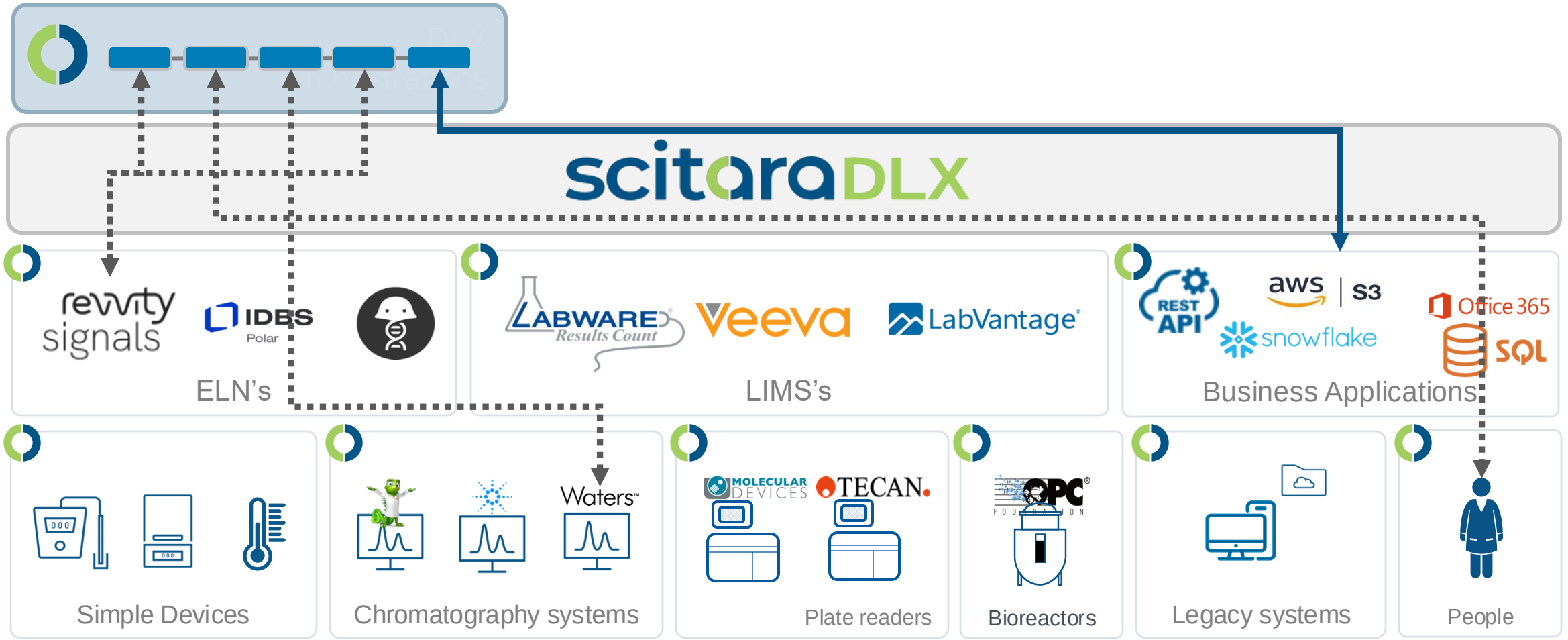
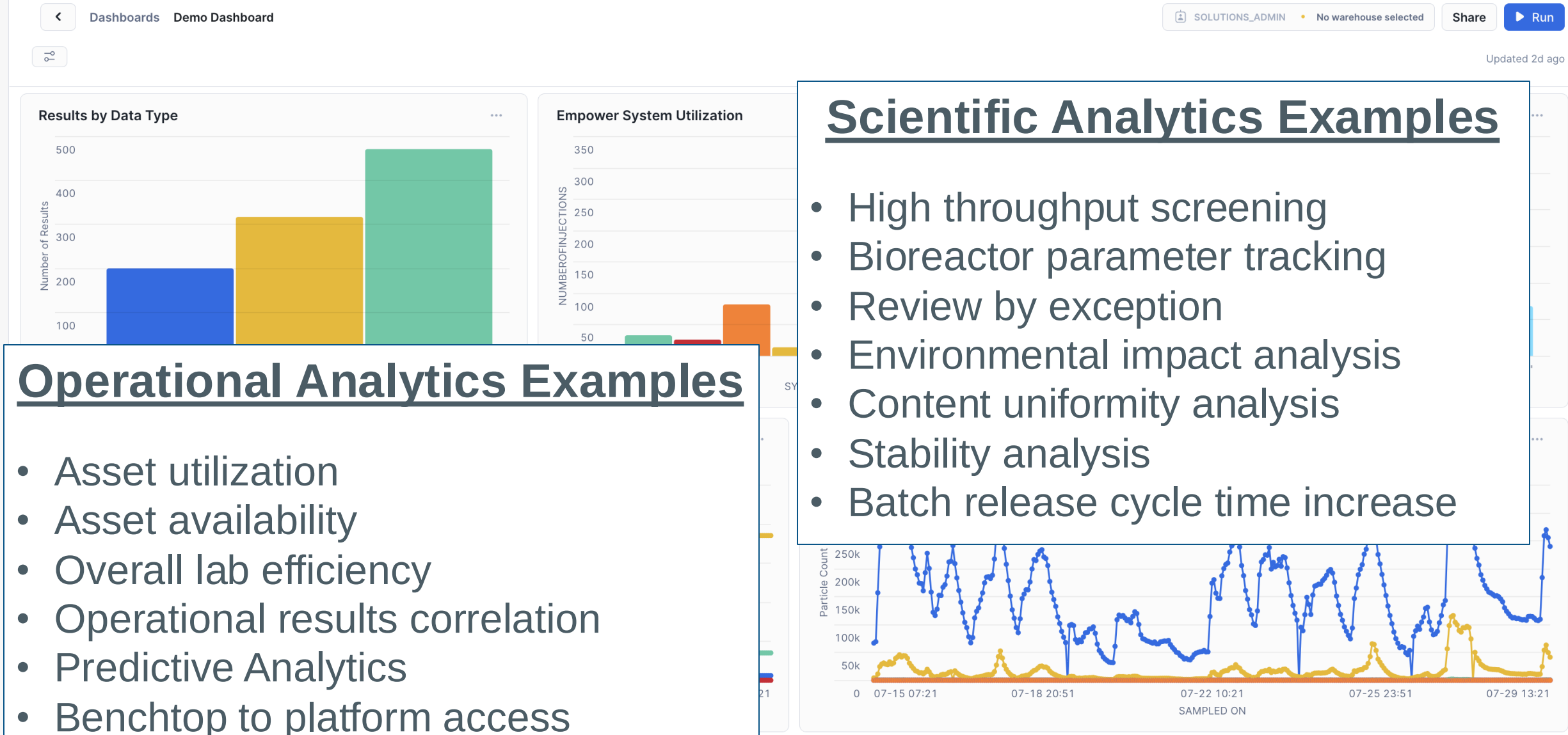
DLX FAIR Data Stream

Transition from transactional to long term Data Value



Drive Data Value through Data Mobilization



Operational Analytics Examples

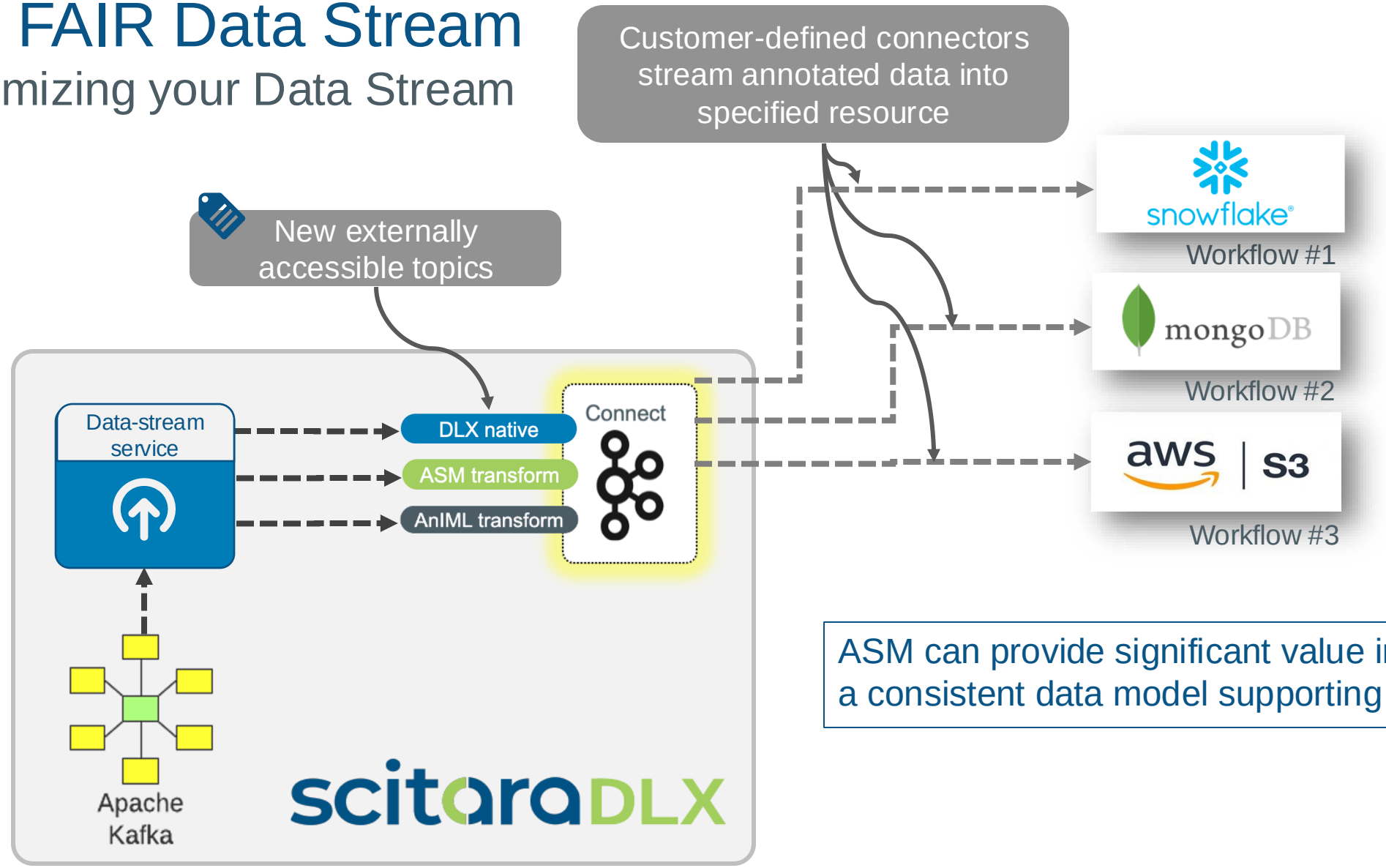
- Asset utilization
- Asset availability
- Overall lab efficiency
- Operational results correlation
- Predictive Analytics
- Benchtop to platform access

Scientific Analytics Examples

- High throughput screening
- Bioreactor parameter tracking
- Review by exception
- Environmental impact analysis
- Content uniformity analysis
- Stability analysis
- Batch release cycle time increase

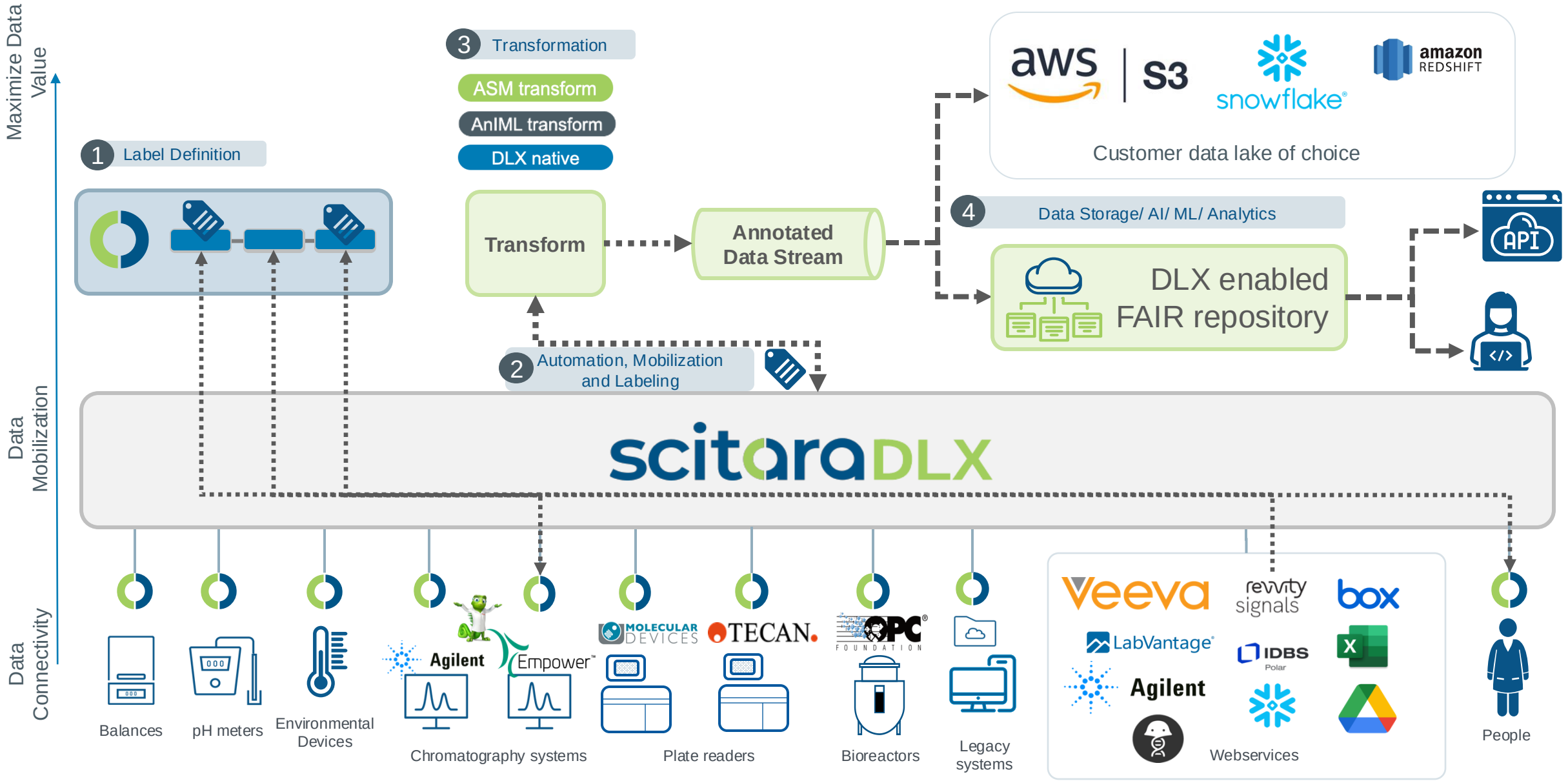
DLX FAIR Data Stream

Customizing your Data Stream



ASM can provide significant value in building a consistent data model supporting AI/ML.

Scitara DLX FAIR Data Strategy



Scitara DLX Role Supporting Analytics, AI and FAIR data

Data-driven lab

- AI/ML
- Review by exception
- QBD
- Real-time release
- Stability/trend prediction
- High Throughput Analysis

Digital Analytics Use-cases

- Lab KPI's
- Reports
- Dashboards
- Predictive Maintenance
- Instrument Utilization
- Environmental Analysis

Connectivity and data standard foundation

Data Repository

Normalized Data Output (ASM for example)

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Balances | pH meters | Environmental Devices | Chromatography systems | Plate readers | Bioreactors | Legacy systems

Lab applications/webservices: Veeva, LabVantage, SignalsNotebook, box, IDBS Polar, Snowflake

People

Scitara AI Initiatives

Leveraging a Lab Digital Core

Building applications on a unified, modern connectivity solution

DLX Orchestrations

DLX FAIR Data Stream

DLX Strands

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DLX Project Strands

Towards agentic AI using advanced LLM interfaces

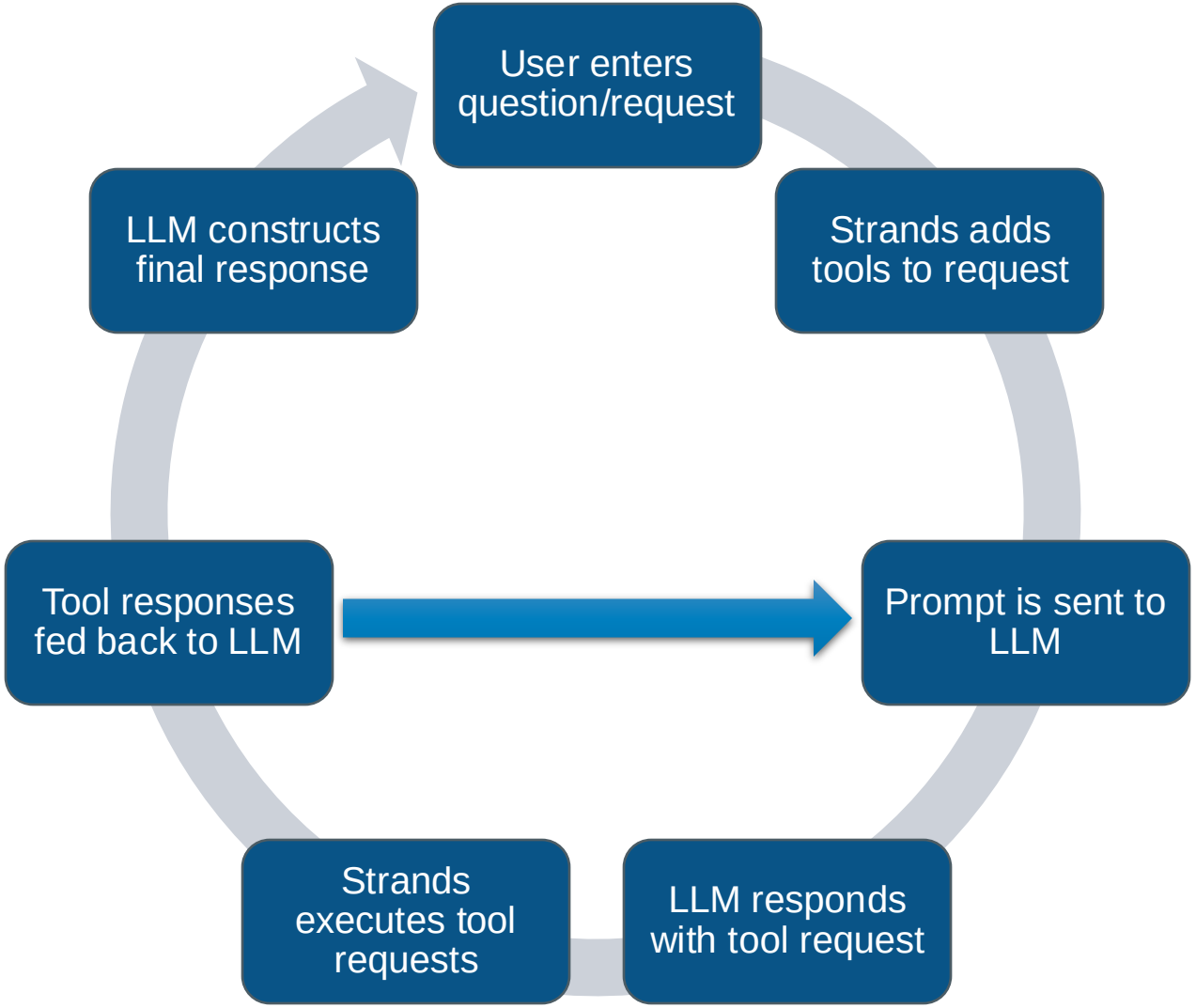
- **Chat-based LLM's use only trained model to respond**
  - Very good for text generation where questions are within the model's trained scope
  - Can suffer from "hallucinations" if question is outside training data

- **RAG (retrieval-augmented generation) can be used to improve response accuracy**
  - Data relevant to the question is retrieved and provided to the LLM
  - Instructions provided to LLM ensure only retrieved data should be used

- **Structured responses can significant expand LLM capabilities**
  - LLM is prompted with instructions that tell it to request assistance to execute user requests
  - Response can include instructions to host application to execute actions (typically API calls)
  - LLM generates response to user only after all assistance requests have been completed
  - Allows LLM to interact with the "real-world"

Using structured responses changes everything

Allows an AI application to access real-world



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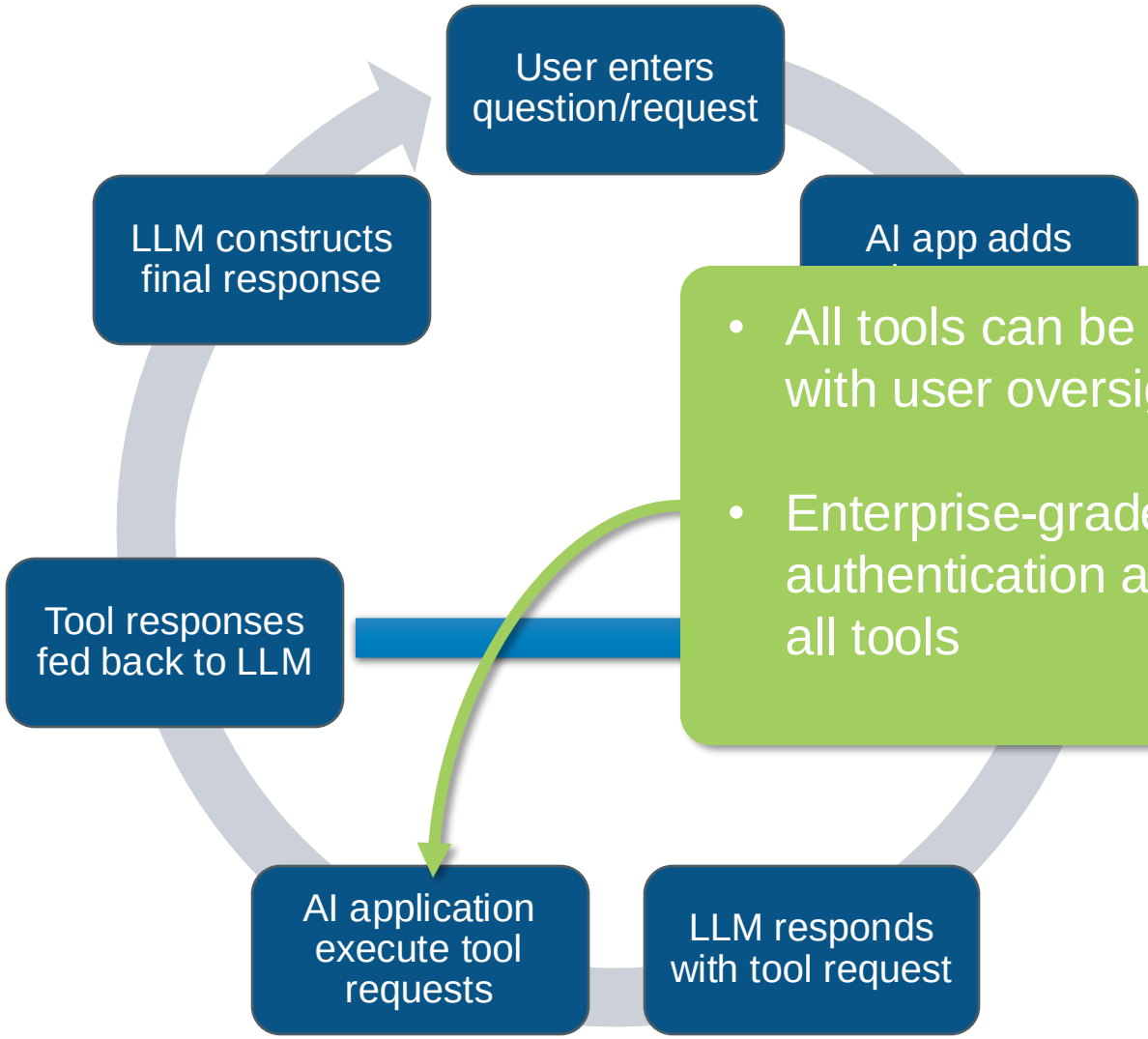

- All tools can be executed autonomously or with user oversight
- Enterprise-grade roles-based user authentication and access control used for all tools

Strands Tools

- Email
- owledge sources
- estration
- hestration
- nection action
- Respond to connection event
- …

DLX project strands – In process

An AI application built on top of DLX that provides a natural-language interface to the lab

- ***An AI assistant within DLX***
  - AI assisted help: *"How do I configure a file connector?"*
  - Help building transforms: *"Create a transform to convert this csv file into json"*
  - Help building orchestrations i.e. *"Create an orchestration that is triggered by a file created event, retrieves the file, parses it as a csv…."*
- ***Use as a step in an orchestration***
  - Strands can be called via an API from within an orchestration
    - After retrieving chromatography data, have Strands review the chromatogram to ensure the peak integration was done correctly
    - Review a data set to find anomalies
- ***As a lab co-pilot/agent***
  - To retrieve data from any connected endpoint: "*Check the LIMS system to see if there are samples waiting for analysis"*
  - Act as an agent: *"When the Agilent Chemstation produces results, retrieve the results, create a report using the attached template and email me the report"*

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Thank you