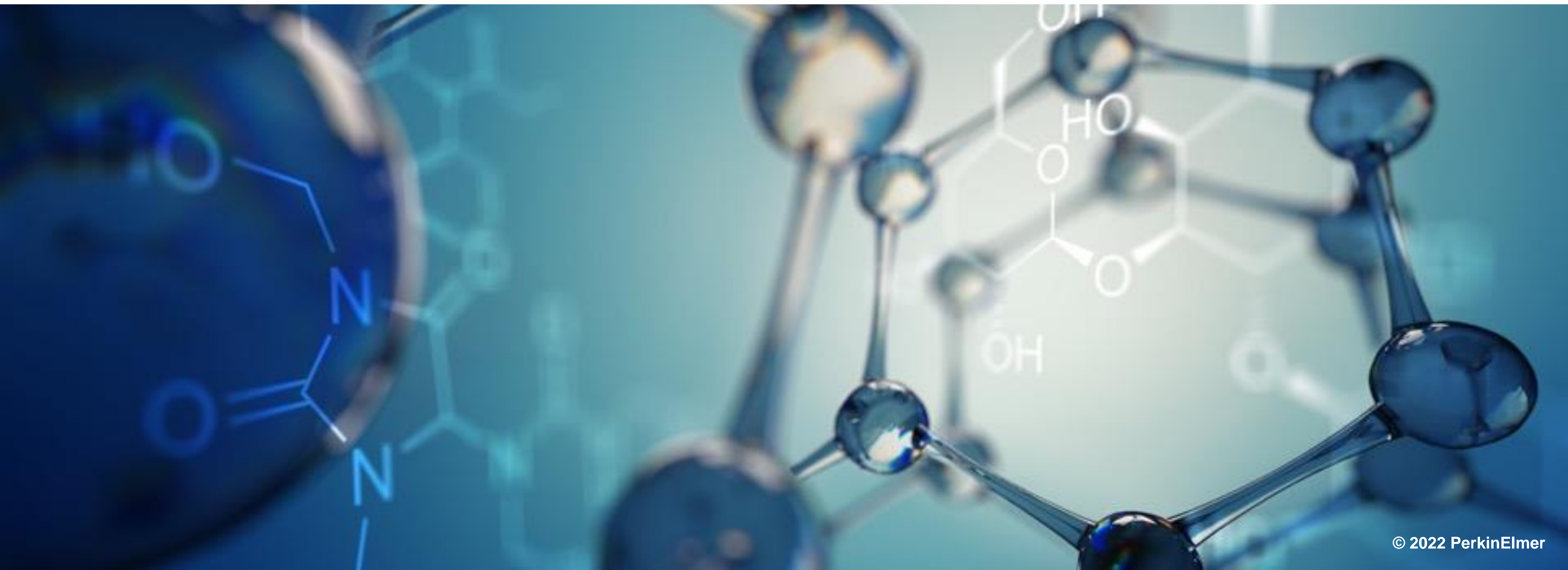# Simple, Smart and Sustainable

The Environmental Lab of the Future

Suneet Chadha, VP/GM Applied & Food Segments

Agenda

- About Us - PerkinElmer Overview

- Megatrends Shaping Labs

- Laboratory Transformation

- Benefits of the Lab of the Future

- How to Begin Your Transformation

- Checklist / Roadmap

- Conclusions

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Our mission of **innovating for a healthier world** is at the core of everything we do as a company…

…to create sustainable value for our planet, our stakeholders, and the communities where we live and work.

Helping tackle tomorrow's challenges, and making an impact for people and our planet, for generations to come
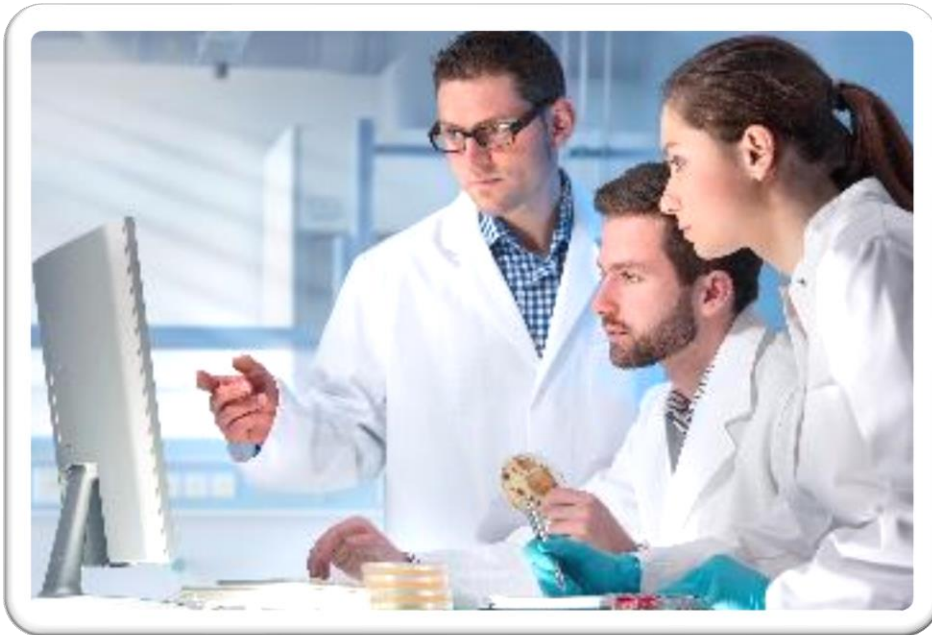
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What We Do - Focused End Markets

Diagnostics

Life Sciences

Food

Applied

Instruments

Consumables & Reagents

Software & Service

What We See – Megatrends Shaping Labs

Next Generation Technologies

Virtualization

XaaS
Software as a Service

Automation/ Robotics

Compliance

Enabling Sustainability

Instrument Connectivity

eCommerce customer self-service portals

Cloud based Computing

Analytics and Data
using AI and ML
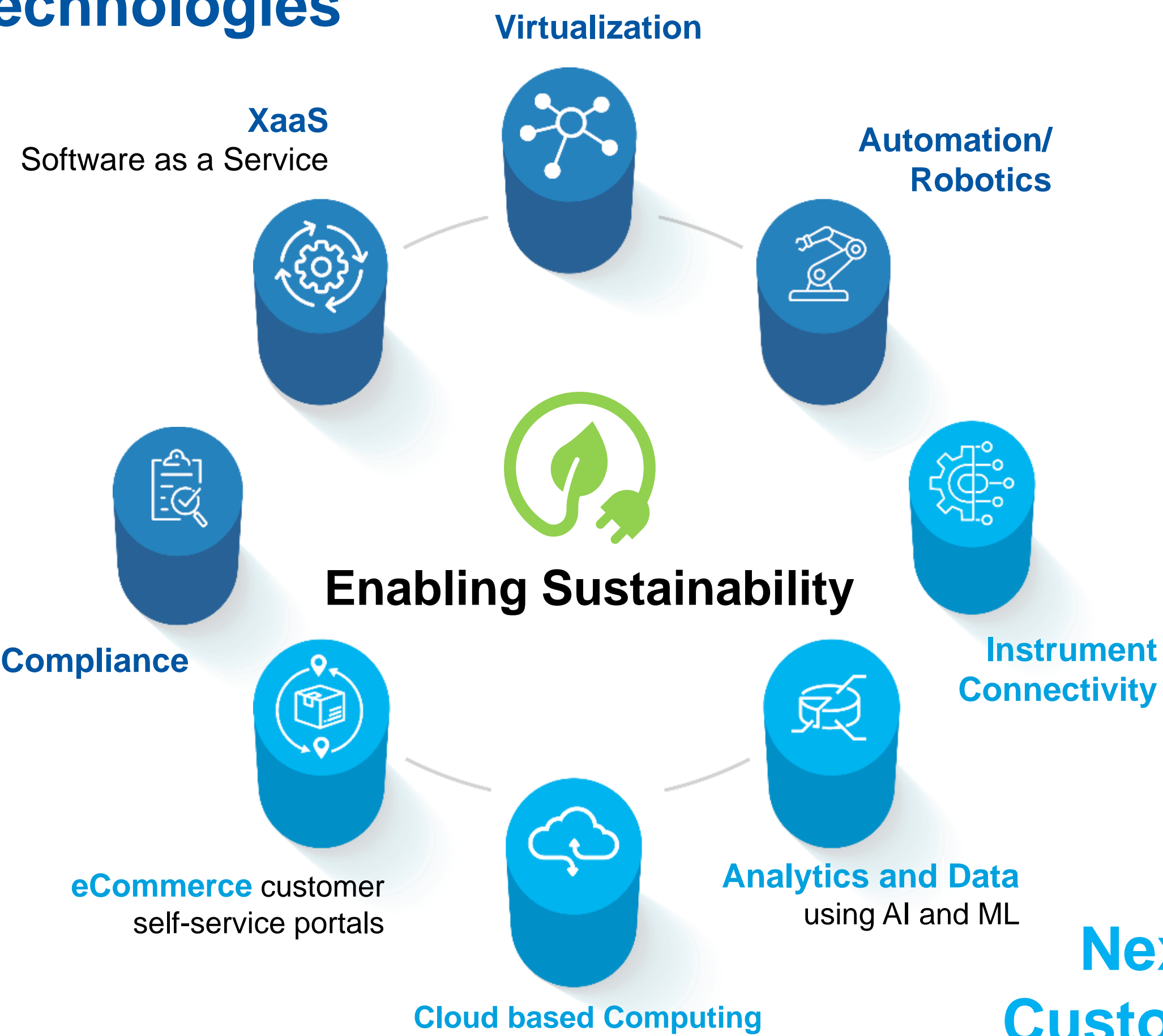
Next Generation Customer Experience

Lab of the Future

Sample Prep | Measure Sample | Analyze Data | Report Results
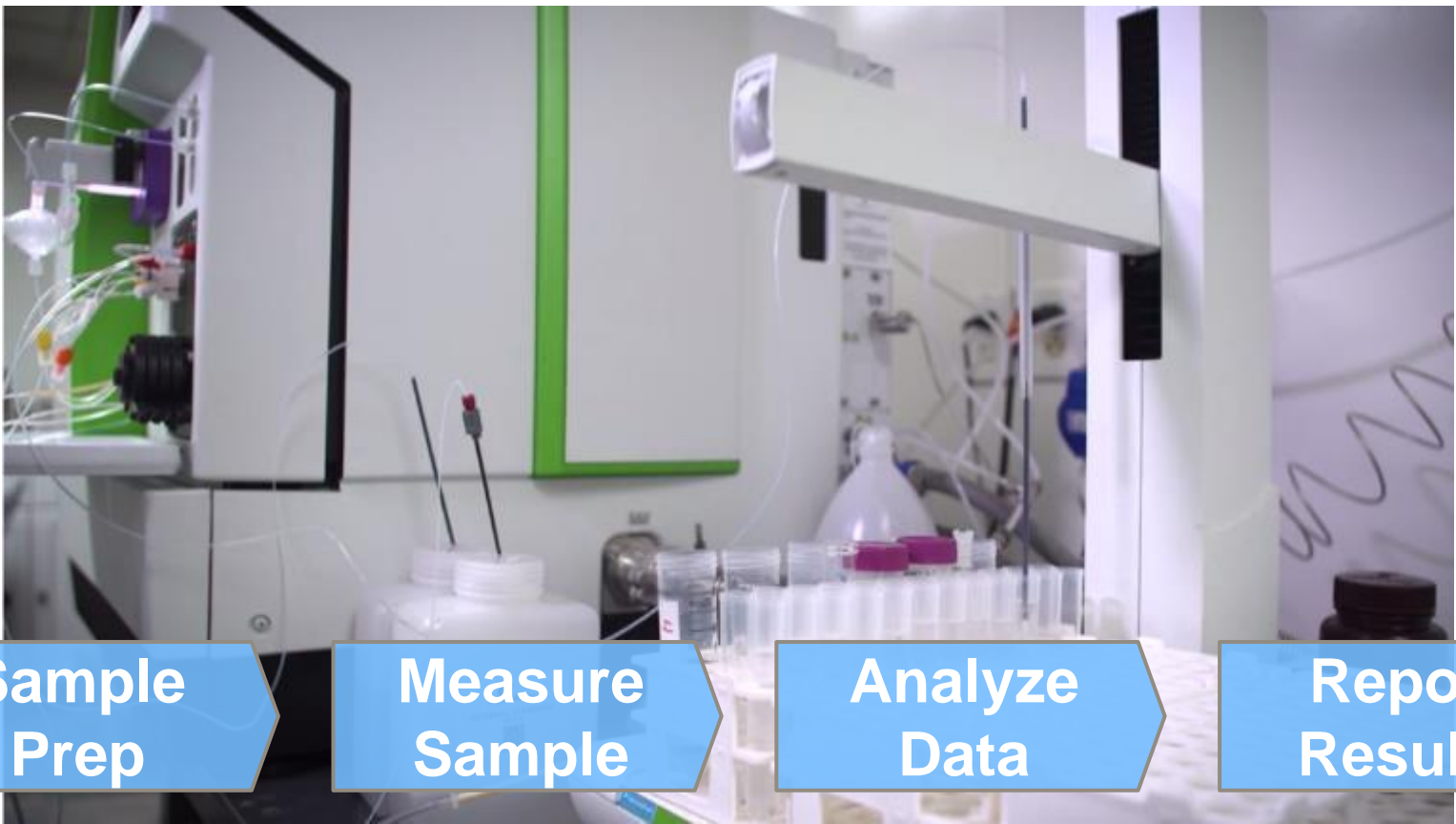
Intelligent robotics-aided workflows

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Are there differences between an Environmental Lab and other labs?

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Engaging with Environmental Leaders and Institutions

www.perkinelmer.com/library/envirochat-interviews.html

Key Take-Aways

Environmentally friendly methods

Remote, Online Monitoring

Easy to Use Instrumentation

Future-Proof Instruments

Simple, Harmonized Methodologies

Automation, Increased Throughput

Engaging with Environmental Leaders and Institutions

*"**Automated systems** are incredibly useful to us…time is money…"*

*"We need to be more **efficient** without compromising **reliability** or **accuracy**."*

*"We are interested in **simplifying analytical workflows** while **minimizing the use of organic solvents.**"*

What are Customers looking for

Productivity

Accelerating Science
Efficiency tools for scientists
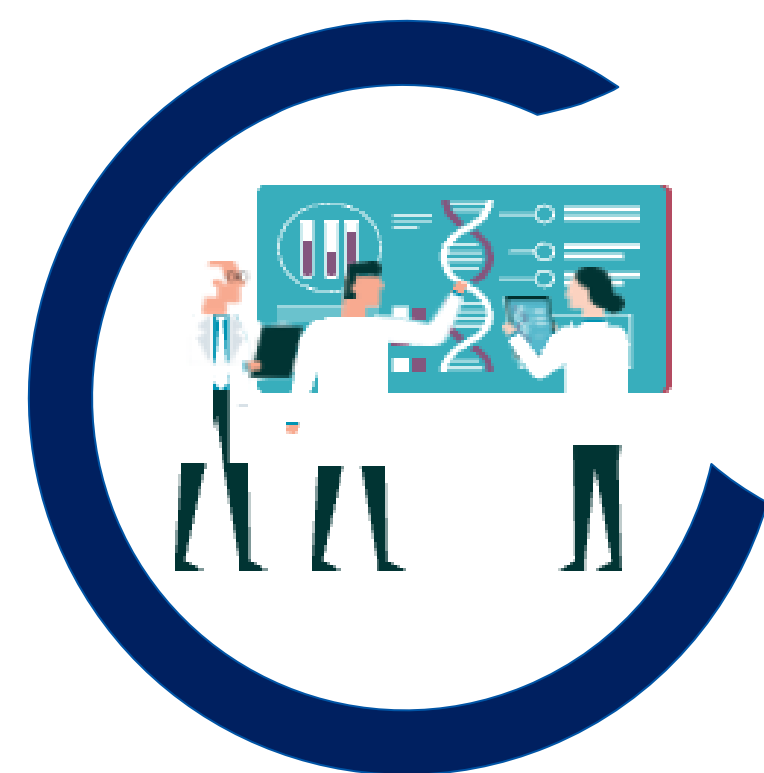Improving reproducibility
End to End Workflows

Sustainability

Energy Utilisation
Carbon Metrics
Waste

Insights

Actionable data
Standardising data sources
Customized reports

Innovation

UX
Utilisation Metrics
The digital Thread

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Common challenges

Technology

Legacy systems
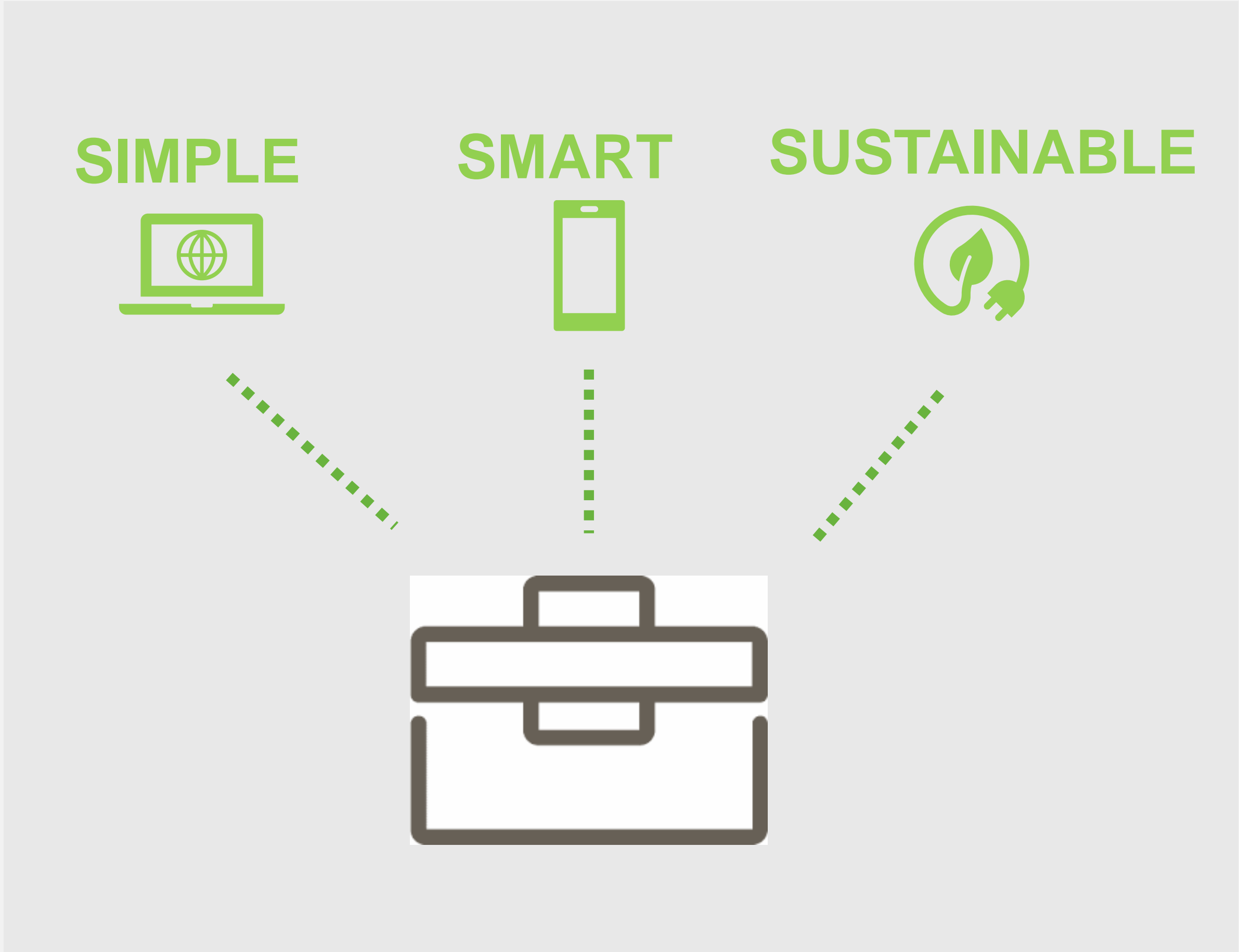> Existing data solutions
> > Sunk costs
> > > Disparate Expertise

Data

Silos: Data held within multiple departments and / or systems
> Accessibility to data
> > Harmonization of data
> > > Software / Hardware
> > > Compatibility
> > > > Data variability & complexity

Productivity

Insights

Innovation

Sustainability

Security & Compliance

Security / Internal IT requirements
> Regulatory requirements, controlled systems

Workload

Ownership
> Volume
> > Bandwidth
> > > Complexity

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Lab of the Future

People

Science

Environment

OPTIMAL OUTCOMES

SIMPLE

SMART

SUSTAINABLE

Laboratory Transformation

Samantha, *Senior Analyst*
Kendra, *Lab Manager*
Zhang, *Novice Analyst*

Understanding people & business needs

1) Analyst Lab Experience

- Hardware introduction
- Software Training
- Coachmarks
- Simplified IA & Taxonomy

2) Complex Analyst Workflows

- Simplified IA & Taxonomy
- Persona-based Workflows
- Feature regrouping

3) Challenges Managing Labs

- Audit trails
- Sample tracking (Lab Management UI)

4) Customer Training Challenges

- Support & Training UI
- Mirco-Interactions and user feedback
- Simplified IA & Taxonomy

5) Troubleshooting

- Real-time analysis feedback
- Mirco-Interactions and user feedback
- Error Notifications

6) Unique User Preferences

- Flexible components and layouts
- Keyboard shortcuts
- Optimized settings

7) Difficulty Managing Data

- Indexible data sets
- Sort and Feature capabilities
- Optimized data graphing
- Real-time analysis

8) Lab Communication Issues

- Sample tracking (Lab Management UI)
- Alerts & Notifications

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Laboratory Transformation

SIMPLE

- ✓ Modern, intuitive interface for ease of use, training

- ✓ Unified and workflow driven

- ✓ Cross portfolio, cross platform software

- ✓ Efficient laboratory operations
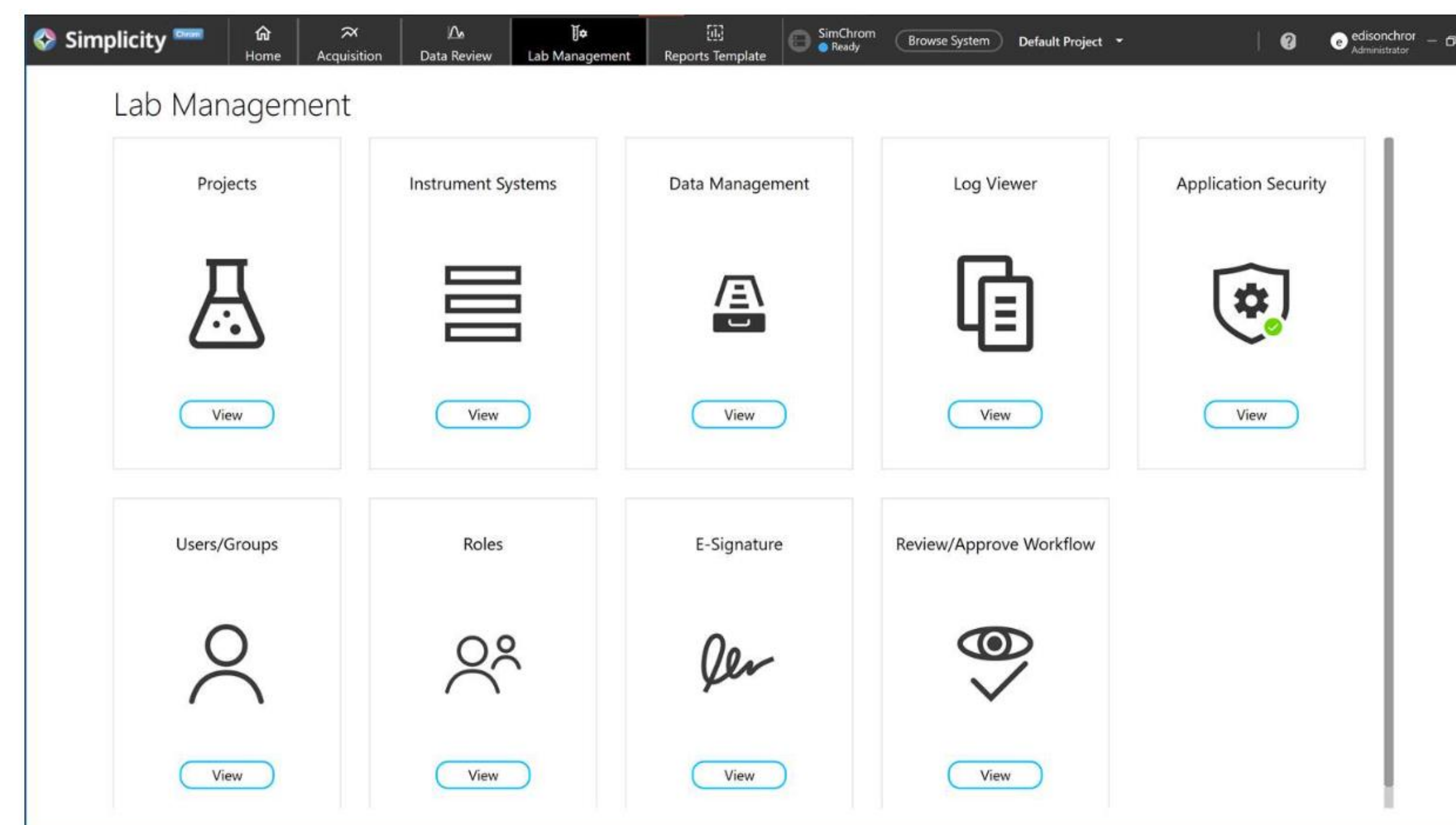
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Laboratory Transformation

SIMPLE

Features of Simple:

- Intuitive interface

- Graphical design

- Easy to learn workflows

- Works across platforms

- Cloud based – data exchange, updates

Laboratory Transformation

SIMPLE

Instrument and workflow services solutions

Help laboratories continuously improve productivity, reduce costs, and focus on core scientific applications
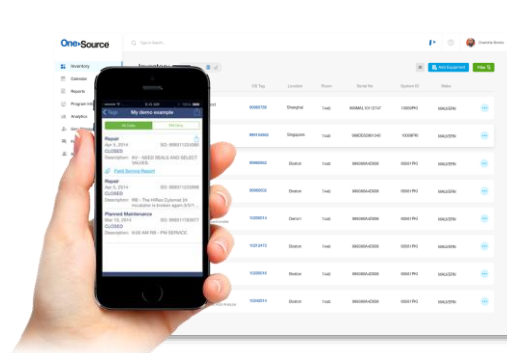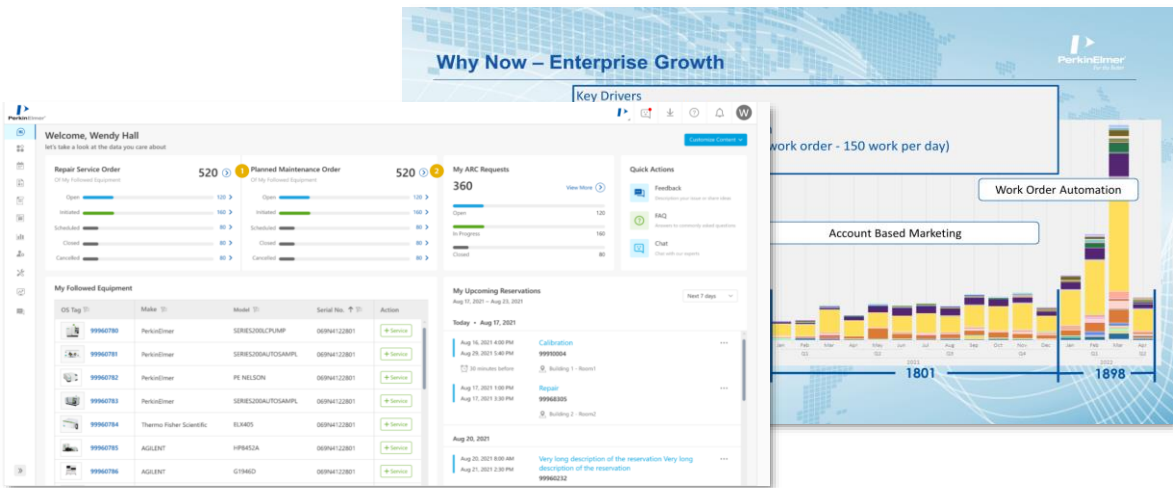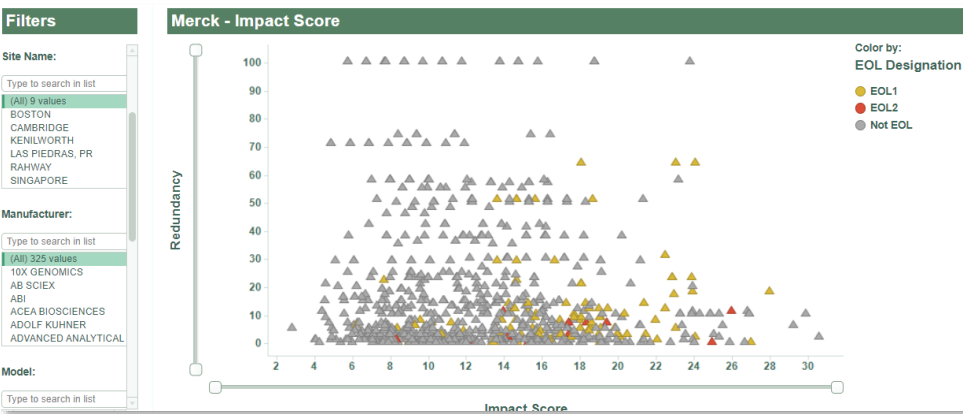
One Source®

Foundational Technology Suite

Asset Genius™ + | RFID | Next Gen Portals | Dashboards

Field & Laboratory Services Portal

- ✓ Allows customers to monitor their **OneSource® relationship**
- ✓ Insights into **all assets** under OneSource®'s purview
- ✓ Ability to **call and track** maintenance orders
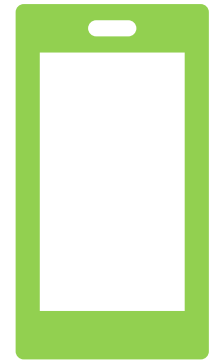- ✓ **Cloud-based** platform

Value Delivery Dashboard

- ✓ **Identify assets** to retire / replace
- ✓ Find opportunities to improve **service delivery** or **reduce costs**
- ✓ Plan to incorporate productivity & **sustainability data**

Key Customers | **Top 10 Pharma Companies**

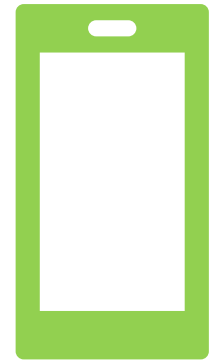PerkinElmer®

Laboratory Transformation

SMART

- ✓ Digitally connected technology
- ✓ Automated
- ✓ Machine learning
- ✓ Sensors, barcodes, monitoring, tracking
- ✓ Remote collaboration, data access, control

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Laboratory Transformation

SMART

Features of Smart Instrumentation:

- Automated workflows
- Remote connectivity
- Flexible and Smart sampling capabilities
- Smart gas management
- Intuitive Design and Ease of Use

Features of Smart Consumables:

- Traceable
- Easy ordering, instruction links
- Optimize consumption, monitor lifetimes
- Automate inventory tracking
- Sample tracking

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Not your average Autosampler

Modular Plug & Play automation devices

- High and low-capacity GC Autosampler trays
- Single & dual towers configurations
- Sharing Autosampler towers on multiple GCs

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SUSTAINABLE

Sustainable by Design

Empowering Sustainability
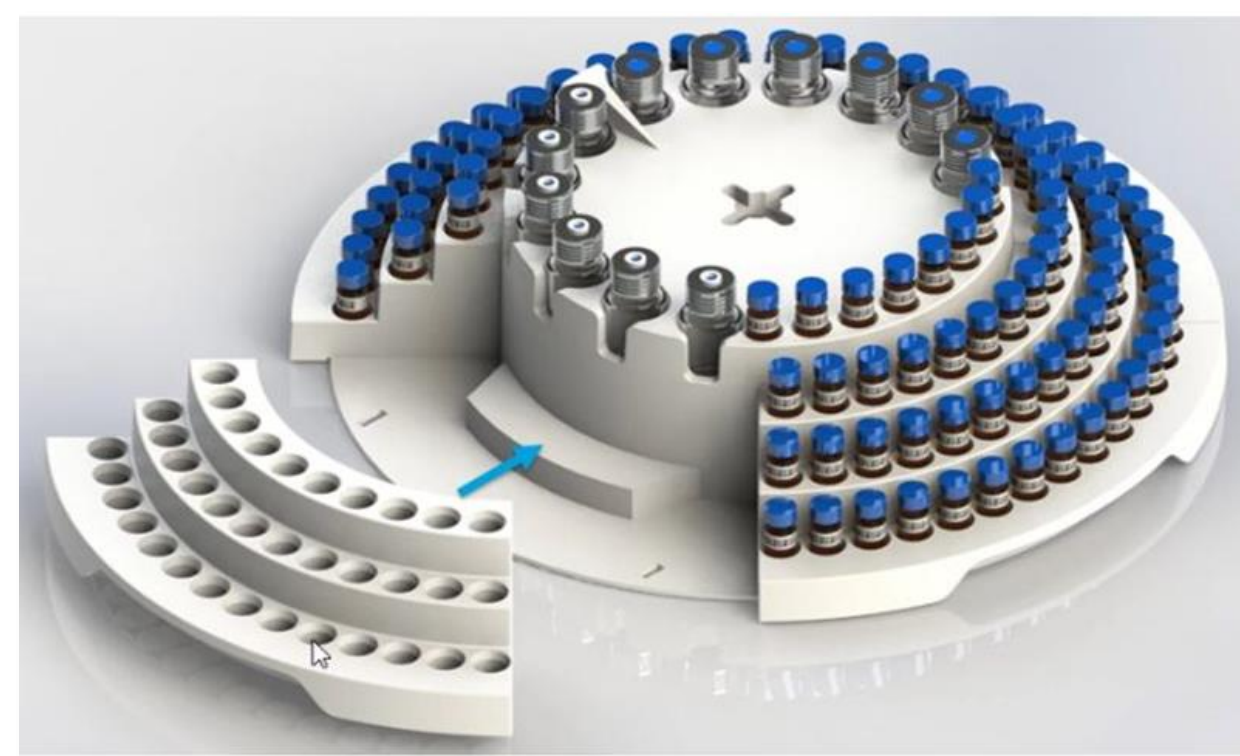
Laboratory Transformation

Sustainable by Design

- Minimizing waste and environmental impact

- Reducing harmful solvent and gas requirements

- Increasing instrument and component lifespans

- Incorporating energy-saving features and recyclable materials

50% lower argon consumption

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Laboratory Transformation

Empowering Sustainability

- **Battery Technologies** to support EV
- Reuse and recycling of **water**
- Maximizing **crop** yields
- Circular economy alternatives in **Plastics**
- Next-Gen **Materials**
- **Asset Utilization**

Laboratory Transformation

Empowering Sustainability

Orange County Water District

- Groundwater replenishment

- 20,000 samples each year

- Supply 2.5 million people with drinking water

- High throughput, reliable data generation are critical

- Low detection limit technology

NexION® 2000 ICP-MS

Soft Drink Manufacturer

- QA/QA testing

- Fast, robust method

- Utilization of non-hazardous reagents and standards – Green Chemistry

- Intuitive, full workflow solution designed to minimize user error and mitigate risk

Soft Drink Additives Analysis Workflow Solution

Asset Utilization : Innovating on Digitization & Sustainability

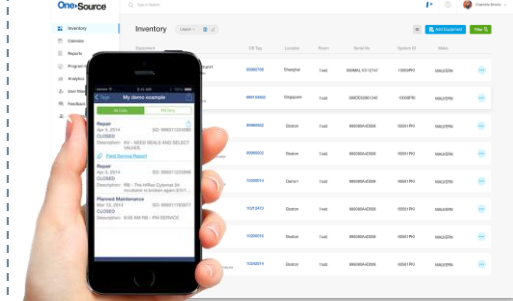## DIGITAL TRANSFORMATION – INTEGRATION OF AI & DATA ANALYTICS
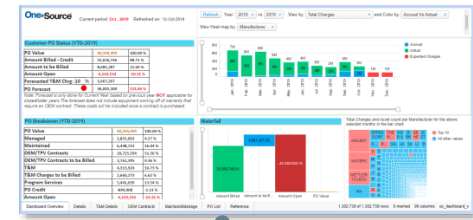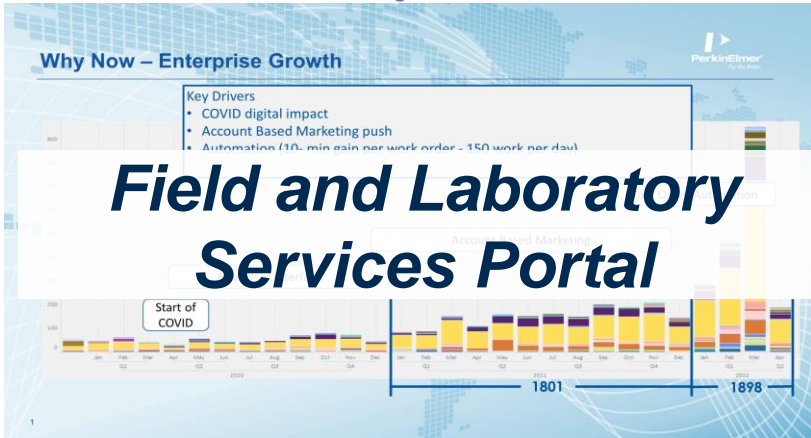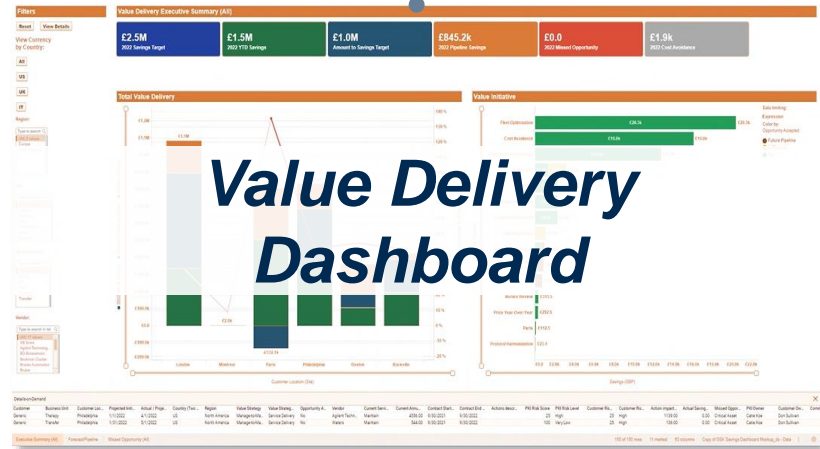
Asset Genius +

RFID

Next Gen Portals

Dashboards
KPIs, Financial Reporting, Benchmarks

Provides customers with the ability to monitor Assets, Utilization and Delivered Value

Field and Laboratory Services Portal

✓ Insights into **all assets** under OneSource's purview

✓ Ability to **call and track** maintenance orders

✓ **Cloud based** platform

Value Delivery Dashboard

✓ **Identify assets** that may need to be retired / replaced

✓ Find opportunities to improve **service delivery** or **reduce costs**

✓ Plan to incorporate productivity & **sustainability data**

SUSTAINABILITY

*Allowing customers to **focus on the science** and **build a greener** laboratory services program*

Customer Spotlight

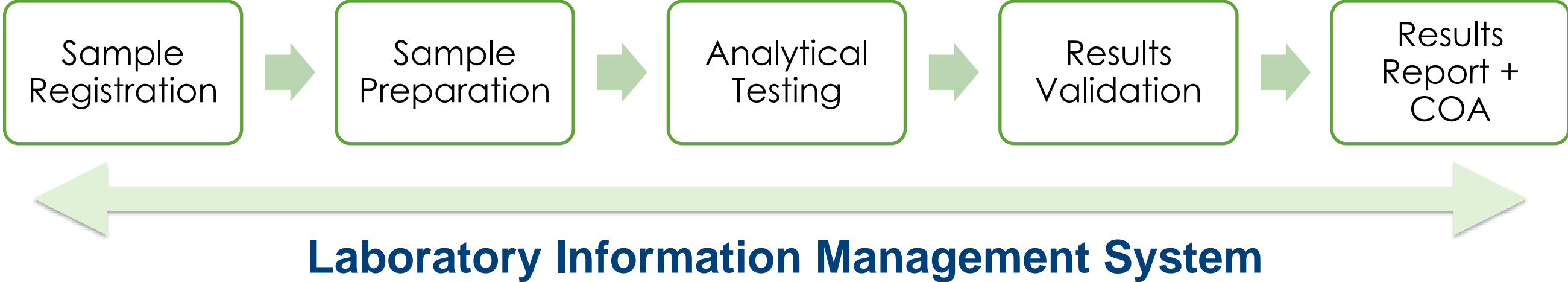In 2021, OneSource assisted in the **decommissioning of ~1,300 assets**
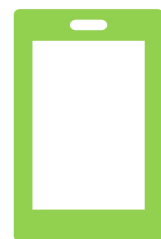
Annualized Utilities Savings

668k kWh   **$80K**

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Lab of the Future benefits

Typical Environmental Testing Lab Workflow

| Sample Registration | → | Sample Preparation | → | Analytical Testing | → | Results Validation | → | Results Report + COA |

Laboratory Information Management System

SIMPLE + **SMART** + **SUSTAINABLE**

=

Increased Productivity

Improved Profitability

Advanced User Experience

Increased Flexibility

Higher Data Quality

Optimized Asset Utilization

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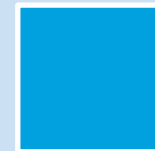
How to Begin your Transformation

How to Begin Your Transformation to a Lab of the Future

Identify Operational Challenges to be Solved

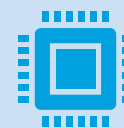Create Business Case

Identify Key Stakeholders

Leadership Buy-In

Research and Select Solutions

How will Change be implemented

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Roadmap to Becoming a Lab of the Future

Step-by-Step Implementation

Trial Projects

- Cost assessments
- Identify risks, barriers
- Demonstrate value, ROI

Incremental Implementation

- Establish Goals
- Gradually upgrade systems (instruments, IT need to be aligned)
- Minimize financial impacts, disruption
- Ensure adoption by lab personnel
- Establish metrics to monitor performance

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Putting it Together - What will the Lab of the Future look like?

Sustainable Methods

Integrated Laboratory Automation

Graphical, easy to use Instrument Interfaces

Mobility / Remote Data Access, Interaction

Smart Instruments

Putting it Together - What will the Lab of the Future look like?

Sustainable Methods

*Smart Carrier Gas management system
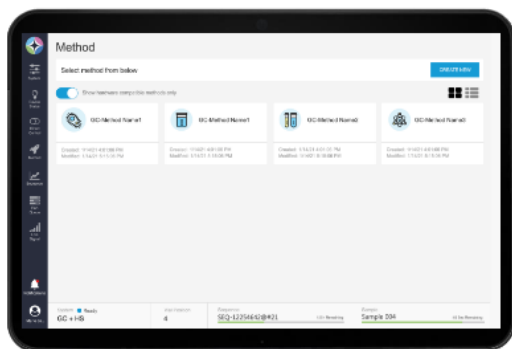H2 as carrier – built in sensor for safety*

Integrated Laboratory Automation

*Plug and Play Automation
Automated Workflows*

Graphical, easy to use Instrument Interfaces

*Detachable touchscreen
Customizable LEDs*

Mobility / Remote Data Access, Interaction

*Simplicity Vision – status from any device
Integrated workflows into SimplicityChrom*

Smart Instruments

*SMARTsource Technology
Smart sampling capabilities*

GC 2400

PerkinElmer

Thank You!

Suneet Chadha
Suneet.Chadha@perkinelmer.com

www.perkinelmer.com/labofthefuture