



< LAB

FORWARD >

CONNECTING  
LABORATORIES

labforward.io

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Industrial Engineer (M.Sc.) with focus on IoT, digitalization and innovation

- > Industrial Engineer M.Sc. at KIT (master thesis on “smart labs”)
- > Supported building up cubuslab GmbH since 2015 (today Laboperator)
- > Experience in digitalization consulting and innovation management
- > Since 2019 Business Development at Labforward for Laboperator product
- > Contact me via [jan.buch@labforward.io](mailto:jan.buch@labforward.io) or add me on [LinkedIn](#).



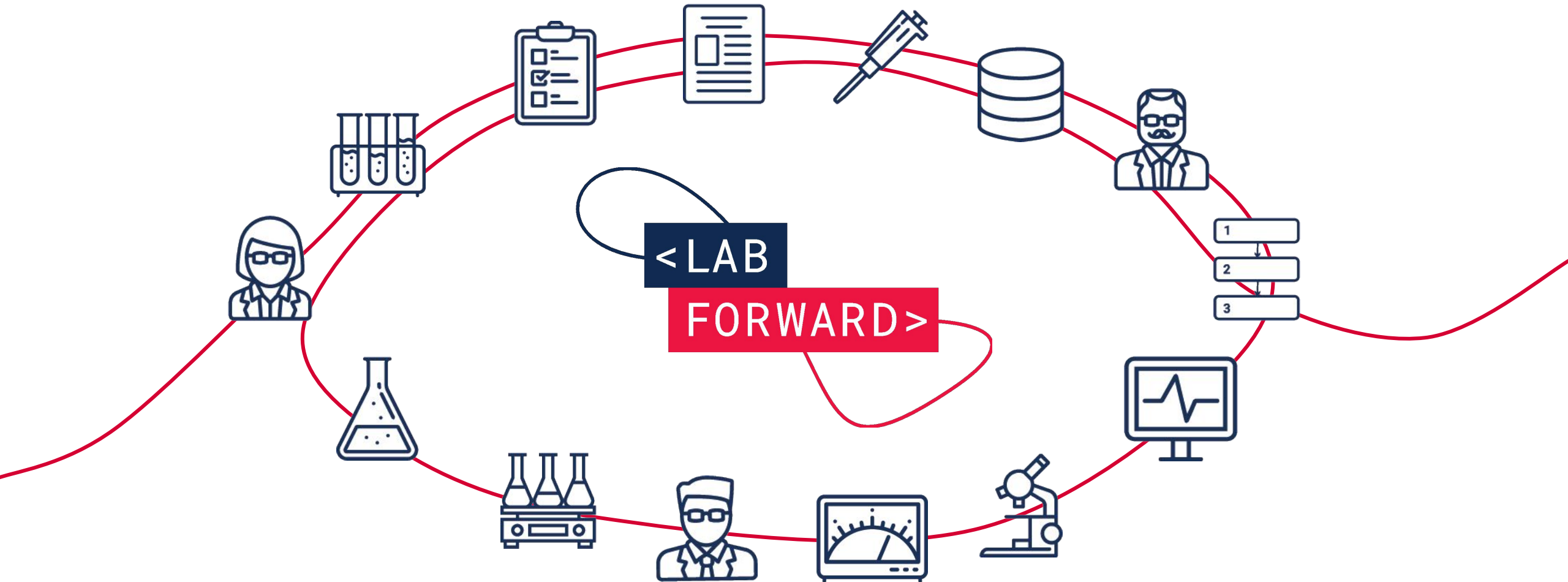
# Each lab is a complex ecosystem of isolated solutions

Scientists face extensive documentation efforts, repetitive tasks, errors and data loss.

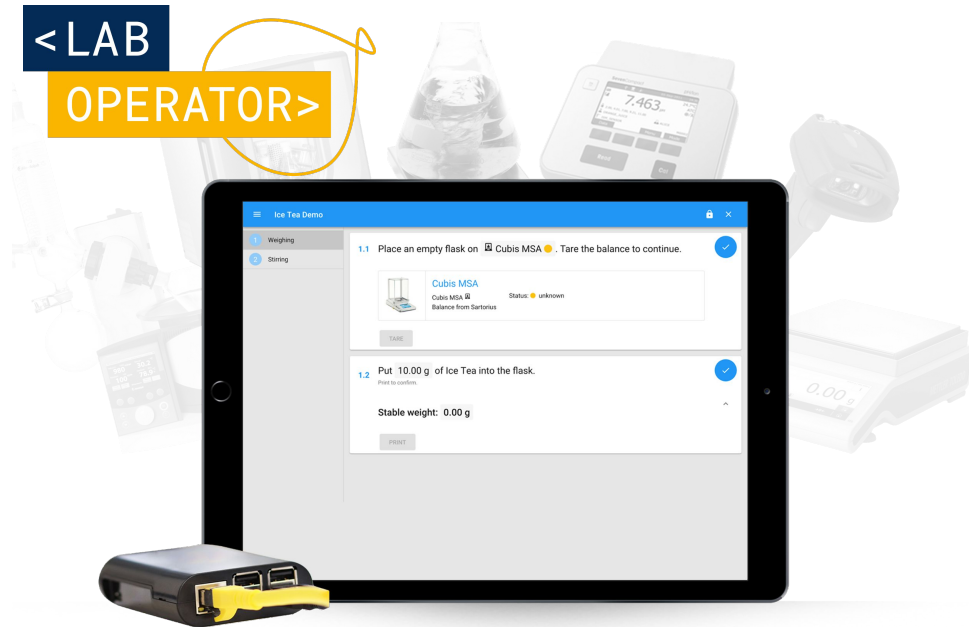


# Labforward connects hardware, software, and teams

It is our mission to support laboratories on their quest to make groundbreaking discoveries.

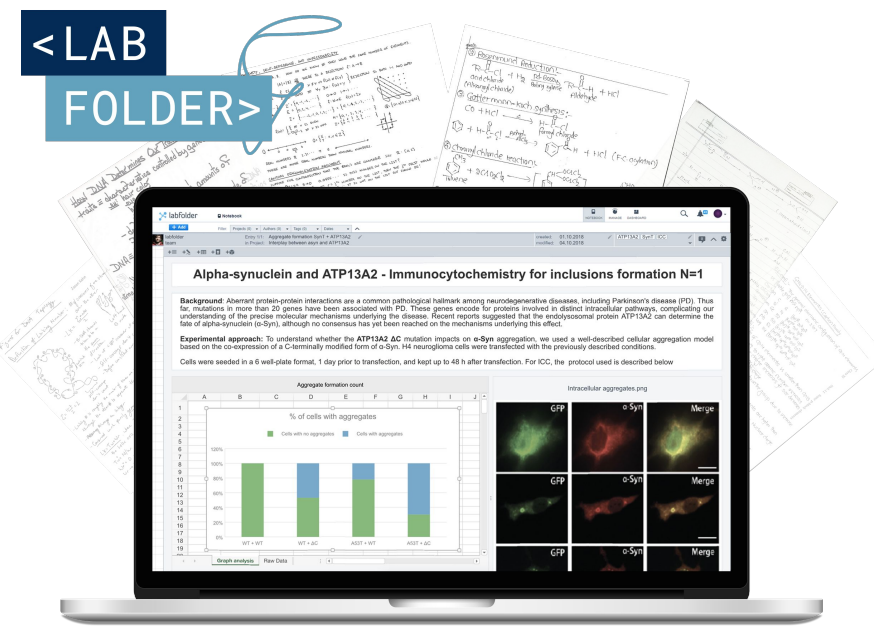


# Our solutions enable the laboratory ecosystem to evolve



## A different approach to laboratory automation.

- > Brand-agnostic IIoT technology.
- > Orchestrate the equipment you already have in your lab.
- > Build and run workflows - collect data on-the-go.

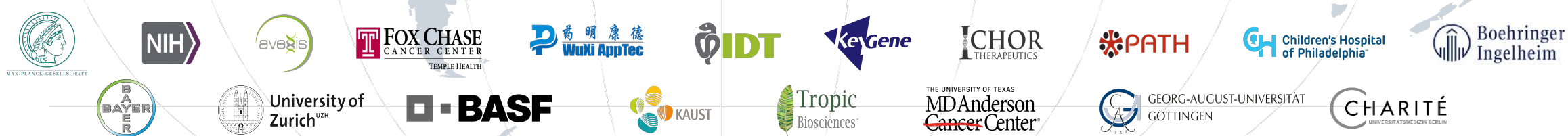
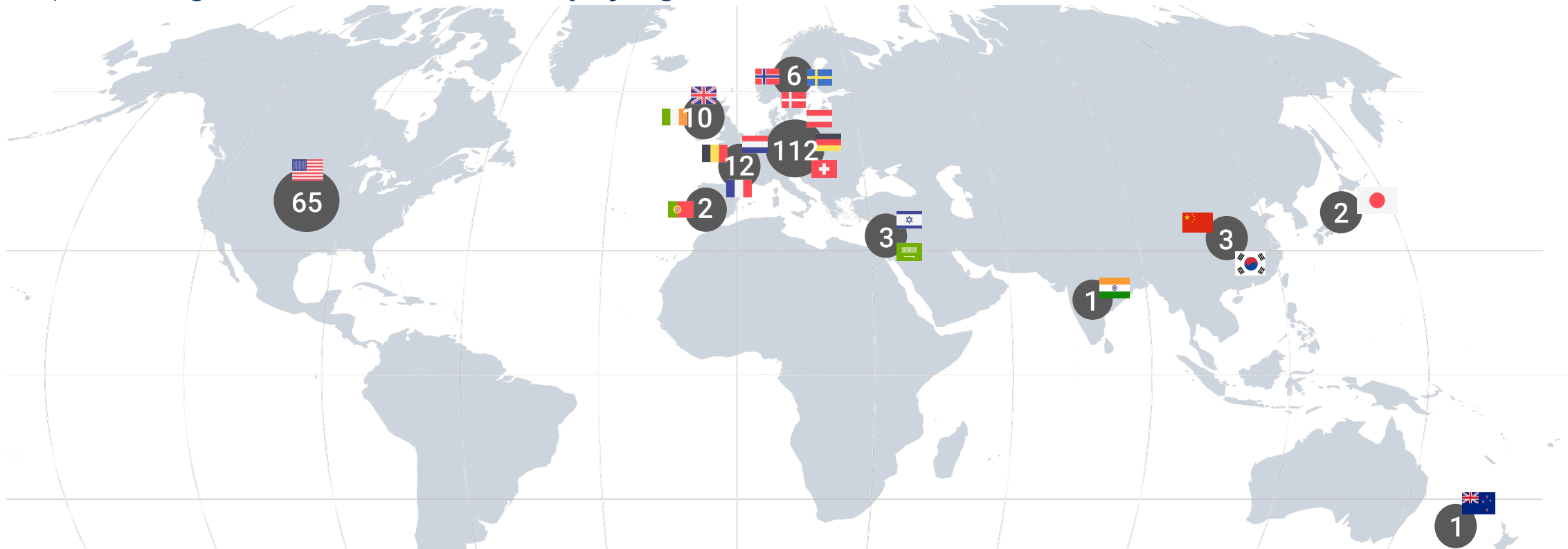


## Laboratory data management reinvented.

- > Intuitive and intelligent software to manage all your data.
- > A fusion of ELN, LIMS and team productivity features.
- > Record, share, retrieve and validate data as a team.

# Assisting laboratory teams worldwide

40,000+ registered users, 7200 + paying users, 210+ customers in 20 countries

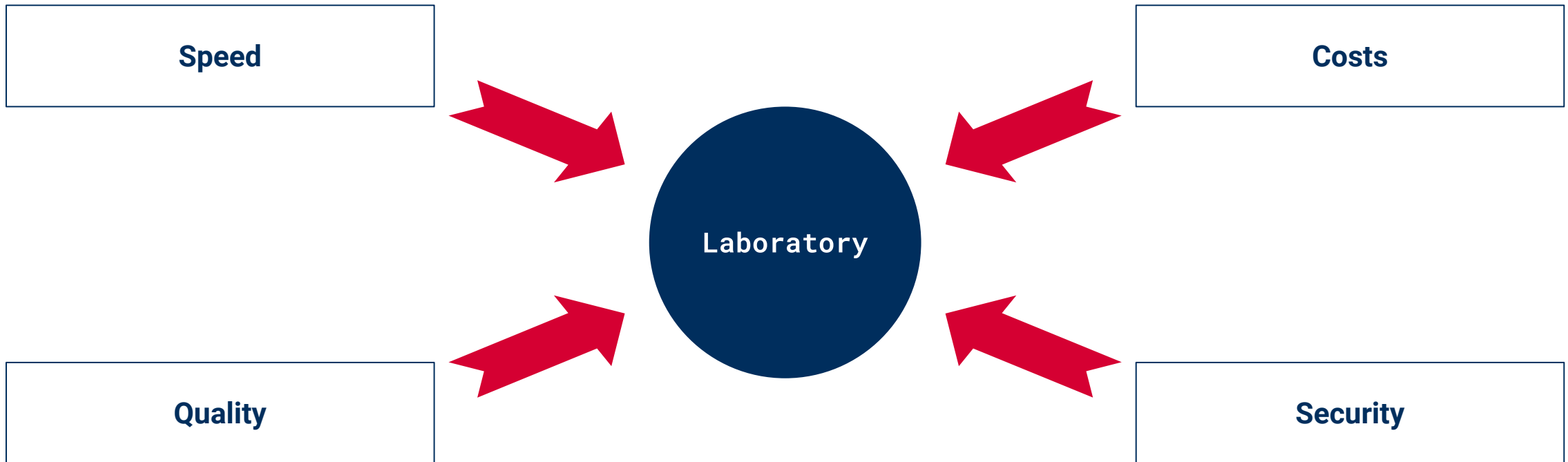


# Challenges and Goals of Laboratory Digitalization



# Challenges of Laboratories

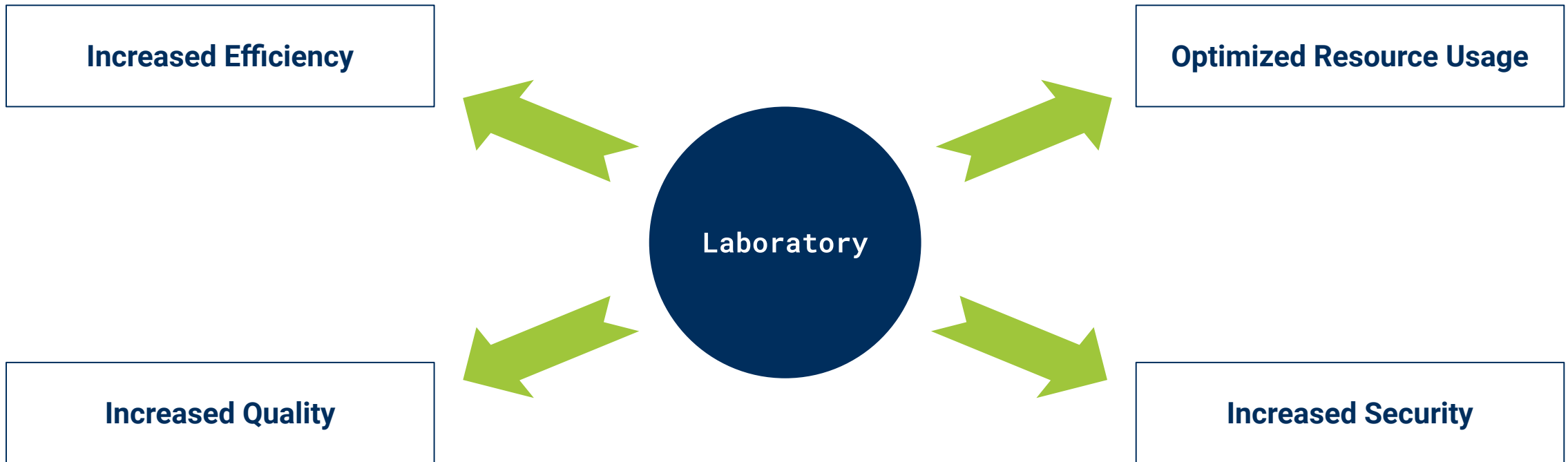
Laboratories are constantly facing different challenges





# Goals of Digitalization

The goals of digitalization address the challenges



# Smart Lab Use Cases

The Use Cases pay in on the different Goals

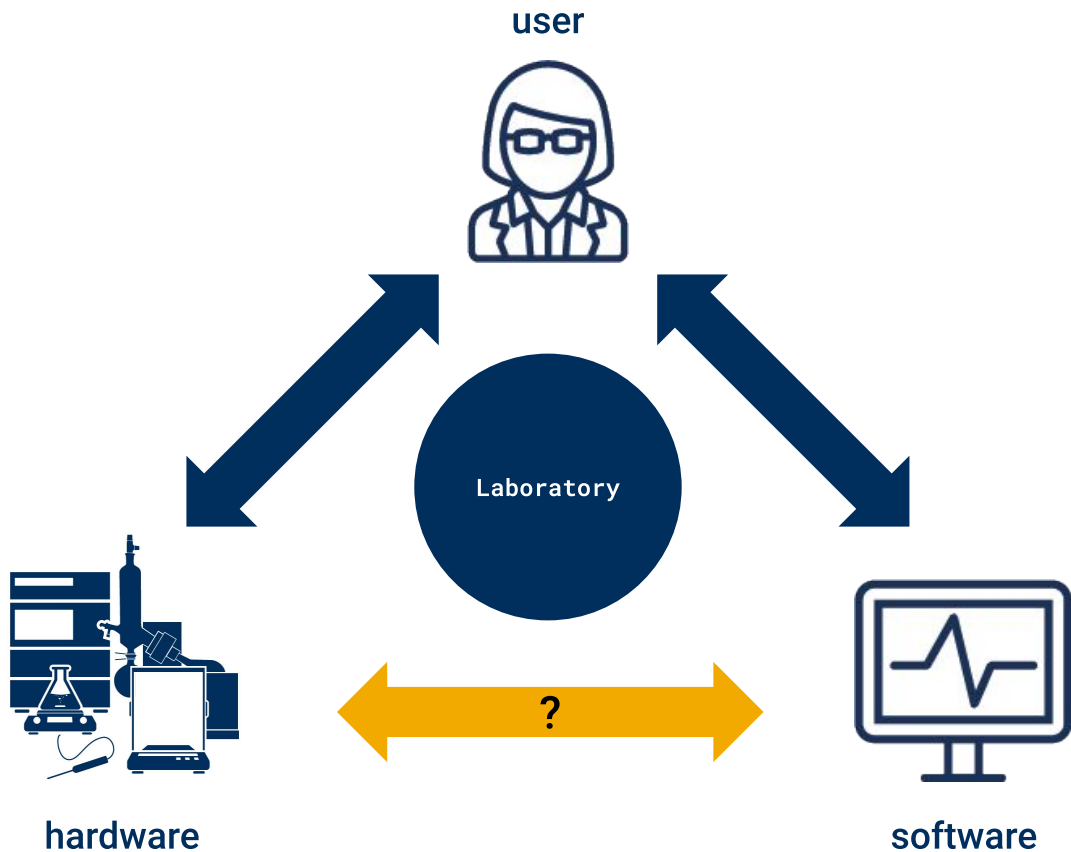
Category	Use Case	Quality	Efficiency	Opt. Resources	Security
Lab Monitoring	Environmental Monitoring	X		X	X
Lab Monitoring	Device Status Checks		X	X	X
Lab Monitoring	Real time Device Monitoring and Alerts	X	X		X
Lab Automation	Device Remote Controlling		X		X
Lab Automation	Automated Data Transfer, Documentation and Reporting	X	X		
Lab Automation	(Semi-)Automated Digital Workflows	X	X	X	X
Lab Automation	Automated Audit Trails	X	X		X
Asset Management	Device Scheduling		X	X	
Asset Management	Utilization Tracking			X	
Asset Management	Maintenance and Calibration Management	X	X	X	X

Demo

Demo

# Device Integration

Device connectivity is a necessary requirement to enable the Smart Labs



## Requirements for Device Integration Solutions

- > manufacture independent integration
- > integration of different types of equipment
- > retrofit solution
- > scalable solution

# Integration Approaches

Different devices require different approaches



## Via Sensors

Device has no digital interface to connect to

uni-directional

example: fridge



## Via USB/ RS232

Device has a common interface such as USB or RS232 and a well defined interface description

bi-directional

example: stirrer



## Via Network

Device is network-compatible and can be connected e.g via REST or industry standard (SiLA, OPC UA, etc.)

bi-directional

example: SiLA balance



## Via Software

Device has vendor specific software and a well defined interface description (API)

uni-/bi-directional

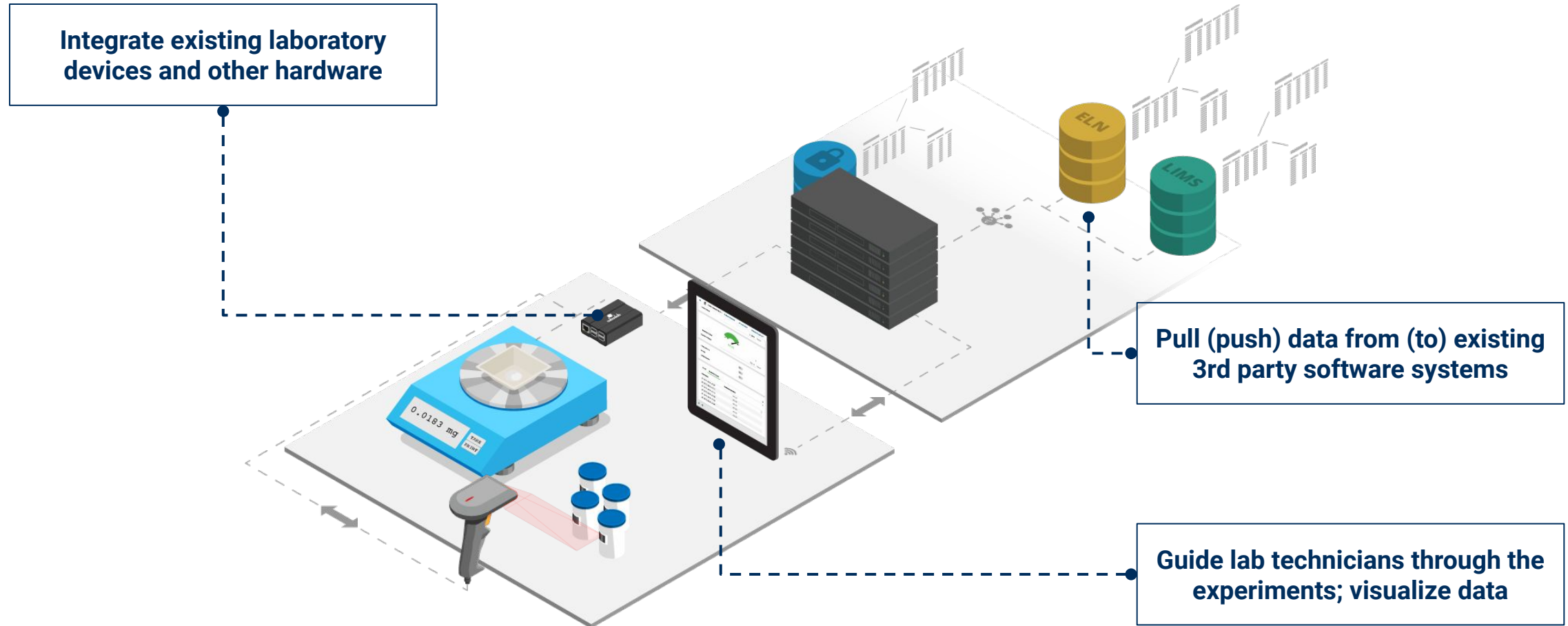
example: HPLC



**Well defined interfaces are key for connectivity!**


# Example: A typical Laboperator setup

Laboperator is a retrofit solution that integrates with the existing infrastructure in labs



# Example: A connector with four devices attached

The four cards represent the four USB ports within the application



The photograph shows a laboratory workstation. On the left, a black camera is mounted on a stand. Below it, a glass flask containing a brown liquid sits on a blue magnetic stirrer. In the center is a silver Mettler Toledo BBx46x analytical scale with a glass weighing boat on top. To the right of the scale is a white pipette and a black USB hub with several cables plugged into it.

Connectors – 0011-9713-7074 [Demo Connector 1] (0011-9713-7074)

Port	Device Name	Manufacturer	Created	Actions
usb-port-top-left	RET Control	Heating/Cooling Unit from IKA	Yesterday at 3:20 PM	CONNECT, MANAGE DEVICE
usb-port-top-right	C922	Camera from Logitech	Last Thursday at 3:21 PM	CONNECT, MANAGE DEVICE
usb-port-bottom-left	Mettler-Toledo BBx46x	Balance from Mettler Toledo	11/15/2019	CONNECT, MANAGE DEVICE
usb-port-bottom-right	VIAFLO	Pump (liquid) from INTEGRA	Last Thursday at 10:47 AM	CONNECT, MANAGE DEVICE

# DEMO



## Plan and prepare

- > Use templates for experiments
- > Set the parameters
- > Trigger the execution



## Execute

- > Execute the experiment
- > Control devices
- > Collect data on the go



## Document, share and search

- > Document the results
- > Share your findings
- > Search data globally

Interested? Let's connect:

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