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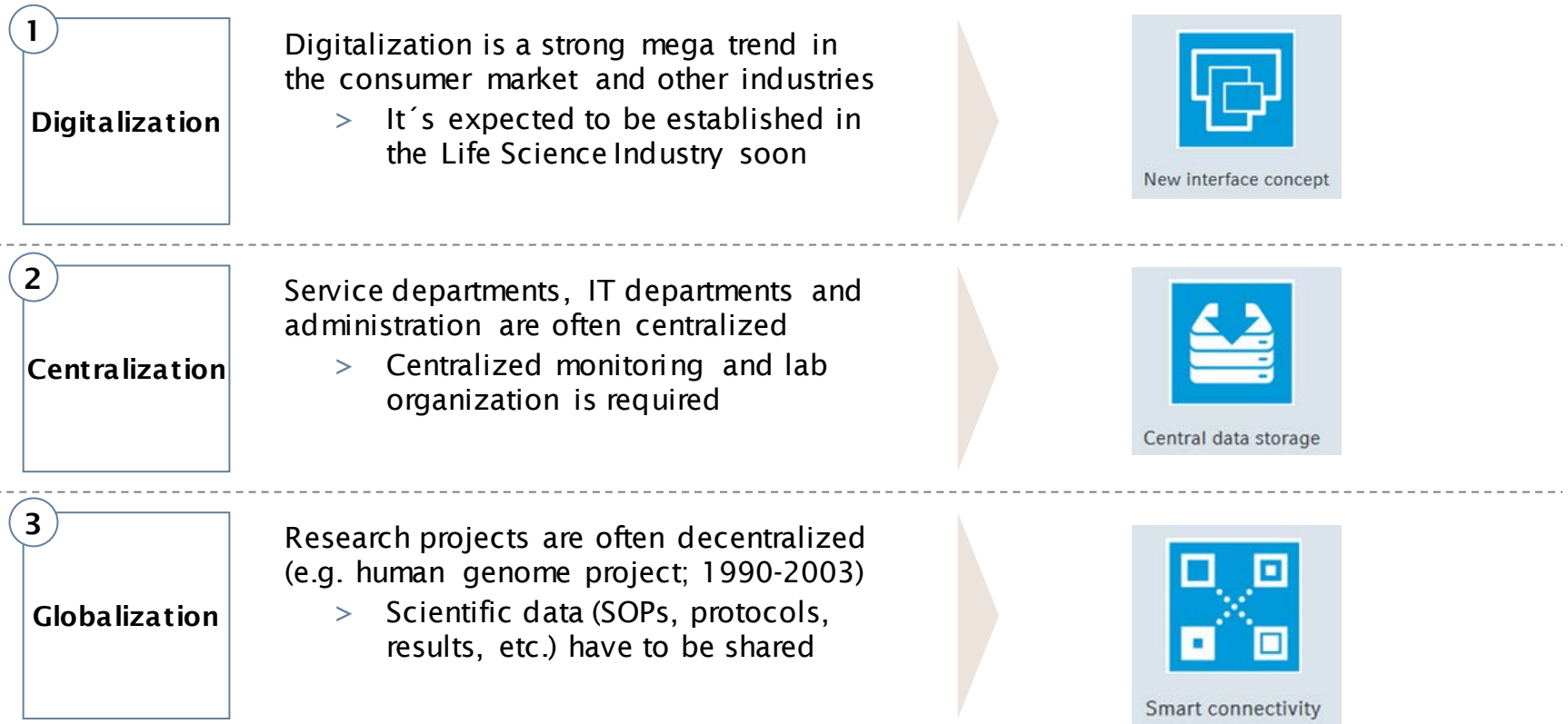
Laboratory 4.0

Connectivity & Digitalization in the Lab

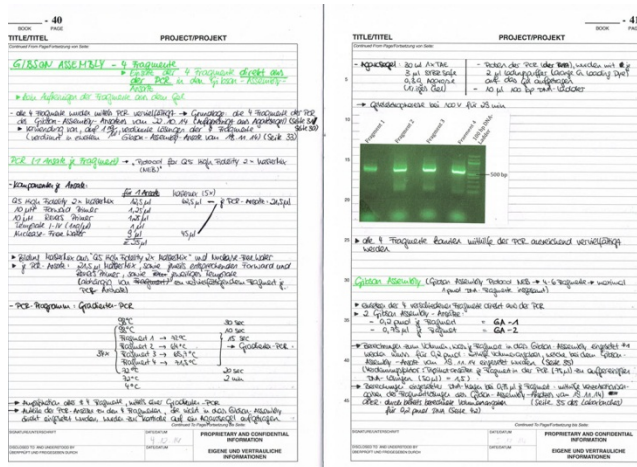
Frankfurt, Achema Press Event, 14. March 2018

Dr. Tanja Musiol

Mega Trends hit Life Science Industry



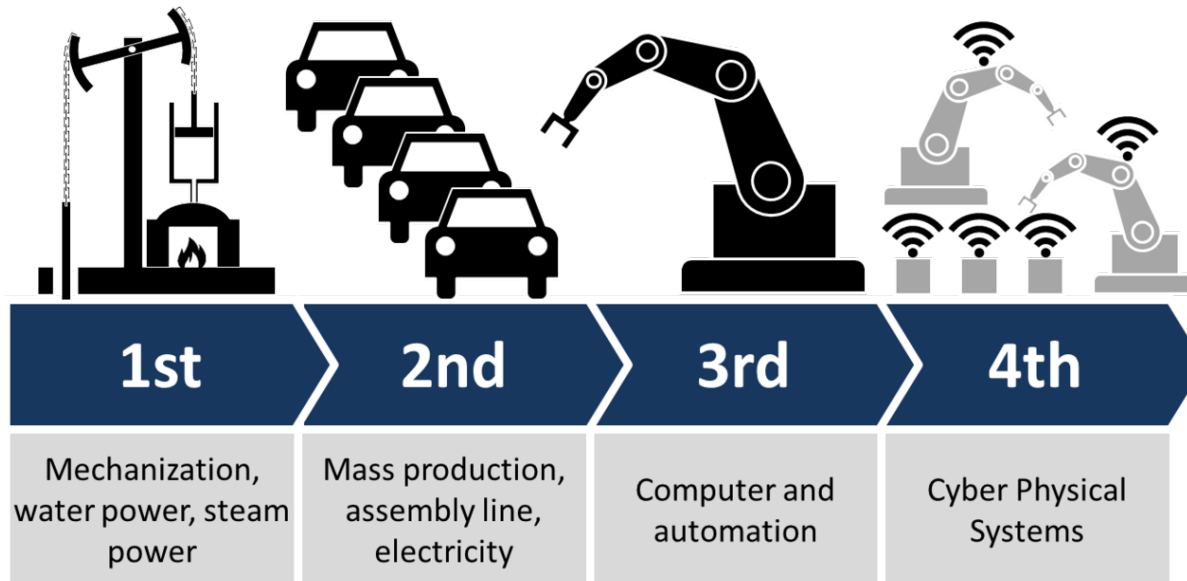
Connectivity & Digitalization in the Lab



Roughly 65% of lab users are already working with **digital applications** in the lab such as **Asset Management** or **Monitoring systems**, **Electronic Lab Notebooks (ELN)** or **Sample Management tools**. (n=153 in 31 countries)

Source: <https://blog.hs-mittweida.de/files/2015/01/laborbuch.jpg>; <http://www.vogel-corporatemedi.de>; SelectScience Survey (November 2017)

Definition: Industry 4.0



The term "Industrie 4.0" originates from a project in the high-tech strategy of the German government, which promotes the computerization of manufacturing.

Industry 4.0 is a name for the current trend of automation and **data exchange** in manufacturing technologies. It includes cyber-physical systems, the **Internet of things**, **cloud computing** and cognitive computing.

Source: Wikipedia https://en.wikipedia.org/wiki/Industry_4.0

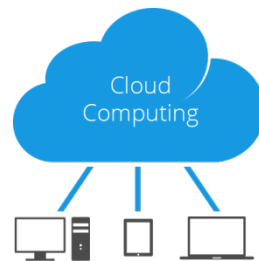
Industry 4.0 compiled to Lab 4.0

1
Digitalization



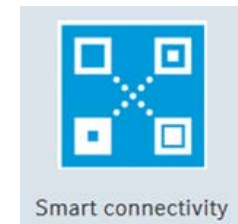
New interface concept

2
Centralization



Central data storage

3
Globalization



Smart connectivity

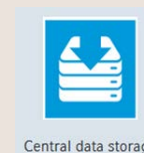
Source: <https://www.sensorexpo.com/iot-ecosystem>; <http://mantec.org/cloud-computing/>; <https://www.thinglink.com/scene/724308097287323649>

Needs for Digitalization in the Lab

Organization of workflows (72%) and thus **increasing of lab efficiency** (79%) to save time (75%) is of immense importance.



Administration of maintenance dates is of highest interest (69%) for lab managers/ users, followed by management of documentation (50%) and analysis of instrument workload (27%) to increase lab efficiency.



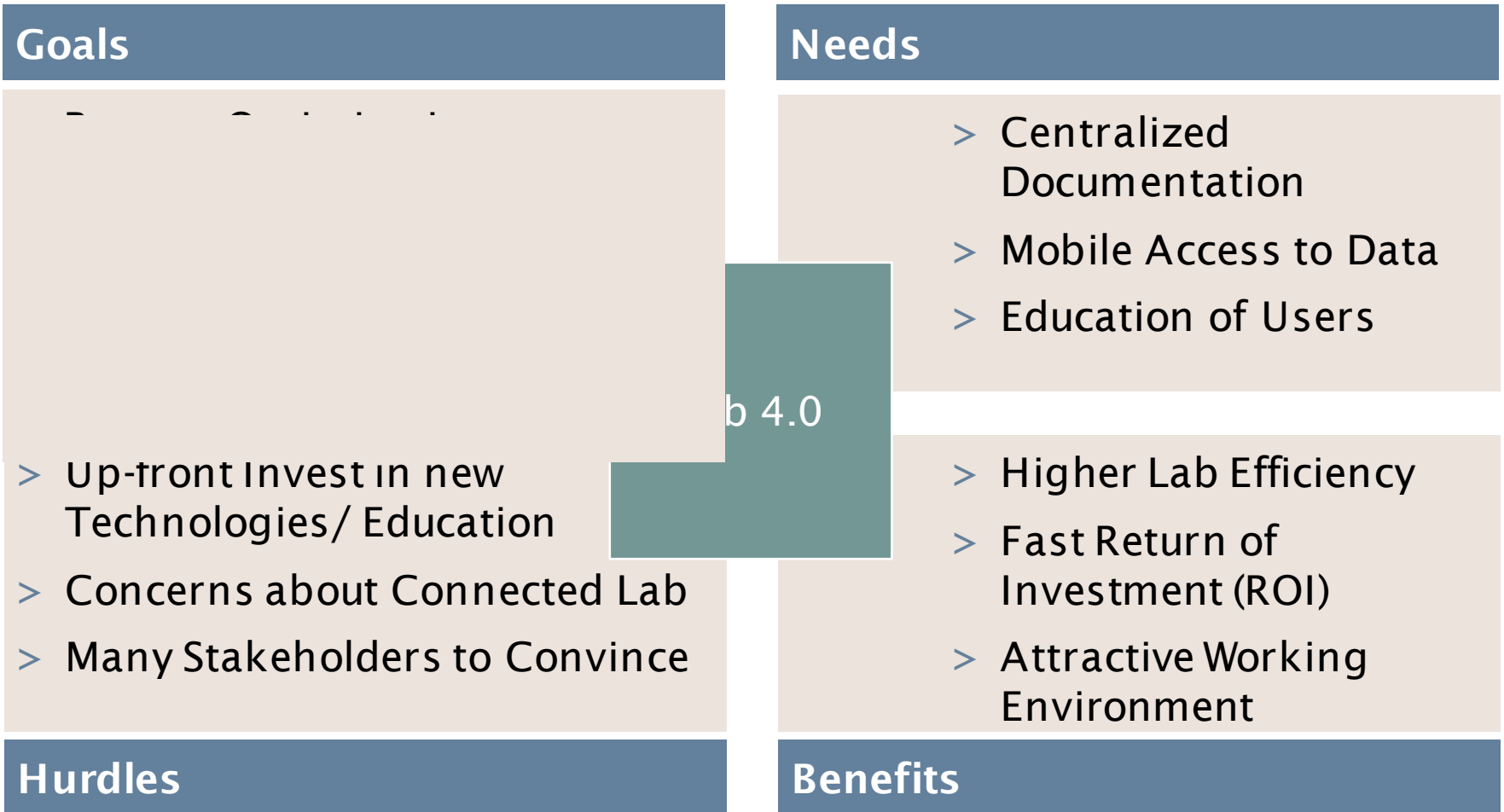
But: Spreadsheets and folders on servers are still often used as “monitoring” and asset management tools. Convenient tools are needed!

Digital Use Cases in the Lab

	Monitor... Events Charts	Docum... Mainte... Support
	24/7 Monitoring	Asset Management
Use Cases	<p>Remote Monitoring</p> <ul style="list-style-type: none"> • Device State & Key functions • Alarm states & Event histories <div style="display: flex; align-items: center;"> <p>Optimize workload of instruments and thus working/lab procedures Monitor remaining runtimes Analyze usage/events Be aware of warnings & errors</p> </div> <p>eMail Notification</p> <ul style="list-style-type: none"> ➢ Get informed in case of events/alarms ➢ Analyze remotely what happened 	<p>Device, contact and document management</p> <ul style="list-style-type: none"> • Location & contacts • Maintenance cycles • Documents & device metadata <div style="display: flex; align-items: center;"> <p>Relevant information at one central place Helps to organize the lab (e.g. maintenance) & lab documentation and thus to save time & money</p> </div>
Instruments	<div style="display: flex; align-items: center;"> <p>New interface concept</p> </div> <ul style="list-style-type: none"> • Freezer • Shaker • Incubator • Bioreactor • Fermenter • ... 	<ul style="list-style-type: none"> • 24/7 Devices <ul style="list-style-type: none"> + PCR Instruments + Centrifuges + Smaller lab instruments + Pipettes + ...

Source: Eppendorf AG

Summary - Digitalization in the Lab



Source: Eppendorf AG

Make Your Lab Smart



**You may take small steps but you should start the journey.
NOW**

Source: <http://www.fernstudieren.de/magazin/die-ersten-schritte-im-ferstudium-wird-der-start-ein-voller-erfolg/>



Thanks for Your Attention

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