

Life Science Disruption by Industry 4.0: Is it just hype?

Examining the forces and technologies that might
or might not have impact on the industry

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#biotech #manufacturing #digitization

09-Apr-2019

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**Building
Technology?
Solving
Problems?**

Why are there so many failures in Digital Transformation?

42%

of the 450 C-suite executives surveyed said they do not know where to start when developing their transformation strategy, yet 37% of businesses have spent over \$500,000 on such strategies in the last 12 months.

41%

of senior leaders said they believe their business transformation efforts have been "a waste of time,"

<https://www.techrepublic.com/article/digital-transformation-a-waste-of-time-41-of-senior-business-leaders-say/>

Setup to Fail

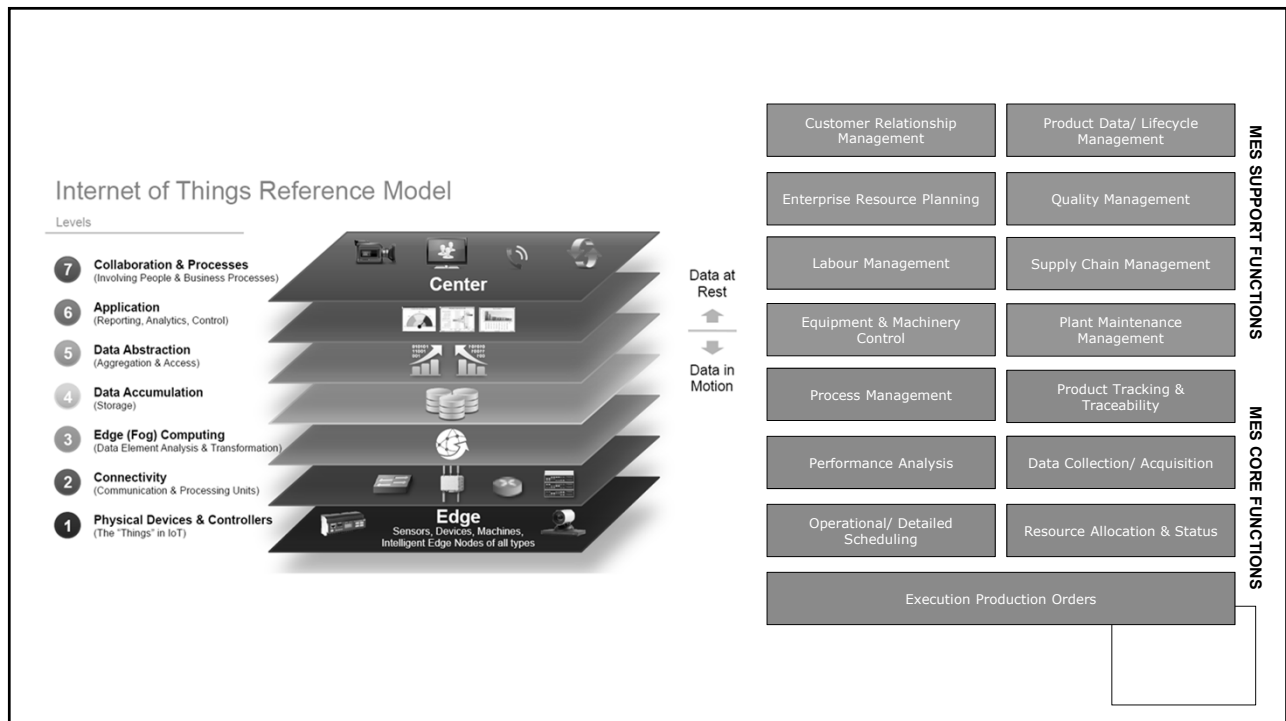
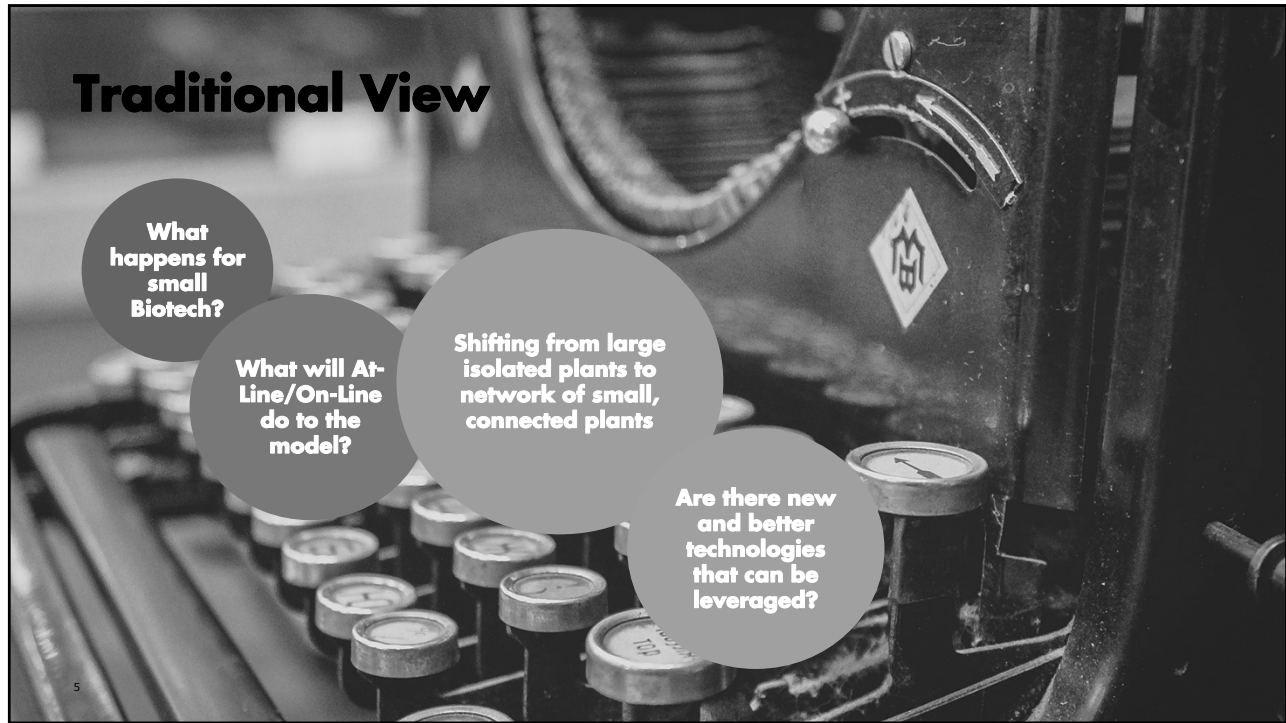
No strategy

**Champions
aren't
empowered**

**Technology first
or customer first
but not both**

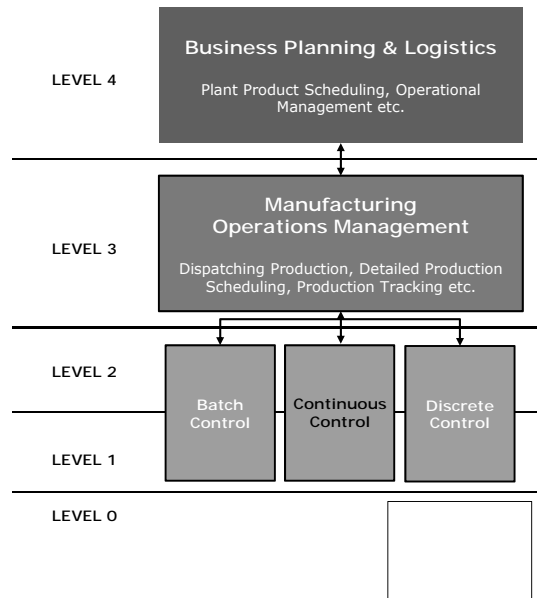
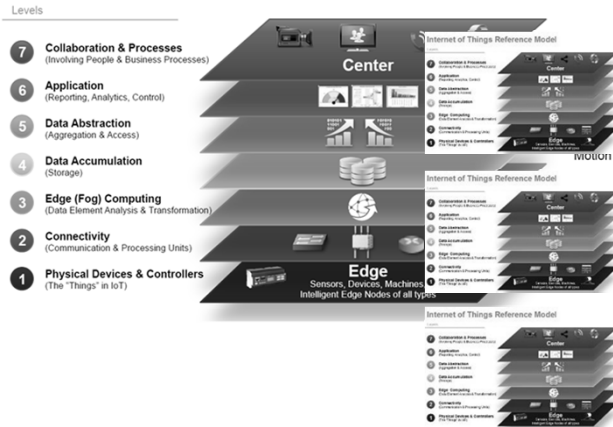
**It still comes down
to change management**

<http://www.techproresearch.com/downloads/digital-transformation-a-guide-for-cxos/#ftag=CAD-00-10aag7f>



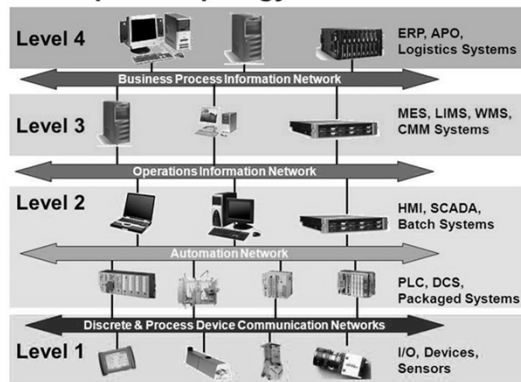
IOT vs. S88/S95?

Internet of Things Reference Model



Now...

Conceptual Topology – IT View



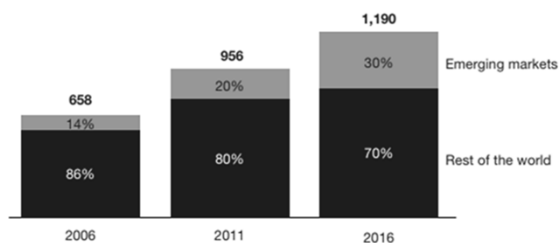




Trends in Emerging Markets – Pharma & Biotech

Importance of emerging markets in a global context

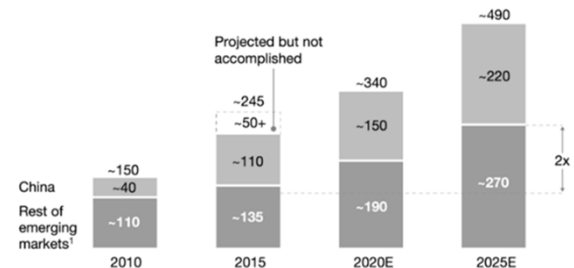
Pharma market development 2006-2016 in US\$ billions



Source: IMS Market Prognosis, September 2011, IMS Pharmerging Overview, 2011

Emerging-market pharma revenues

Pharma market projections in US\$ billions



¹Brazil, India, Russia; Tier 3: Algeria, Argentina, Bangladesh, Chile, Colombia, Egypt, Indonesia, Kazakhstan, Mexico, Nigeria, Pakistan, Philippines, Poland, South Africa, Saudi Arabia, Turkey, Vietnam

McKinsey&Company | Source: BMI Research (May 2017); IMS Global Use of Medicines



Single Use Market



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Is IoT the Answer?

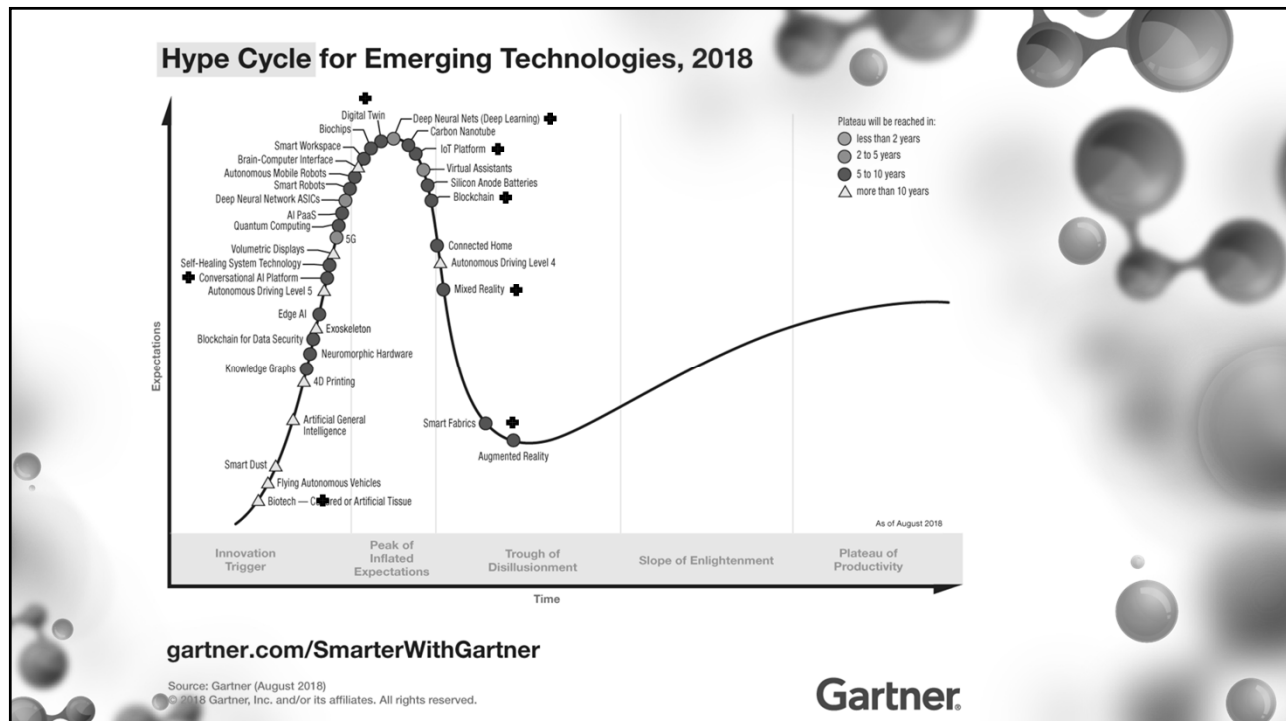
Emerging Biotech Demand

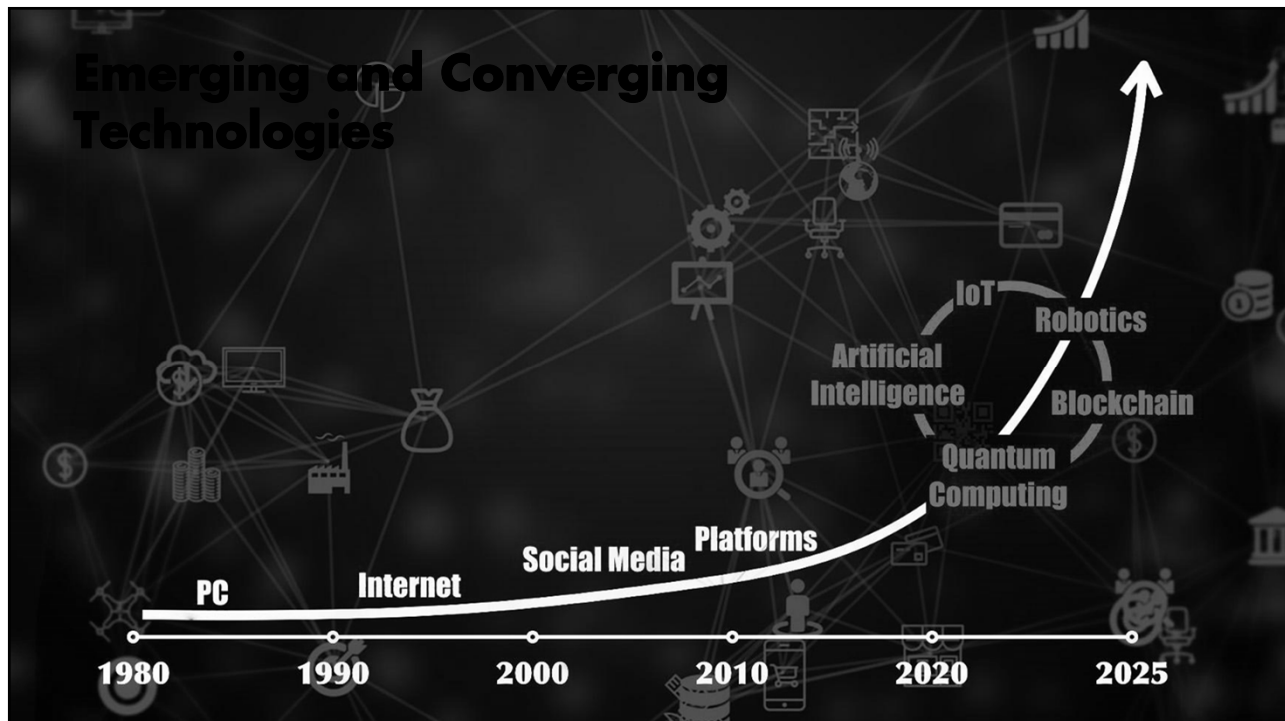
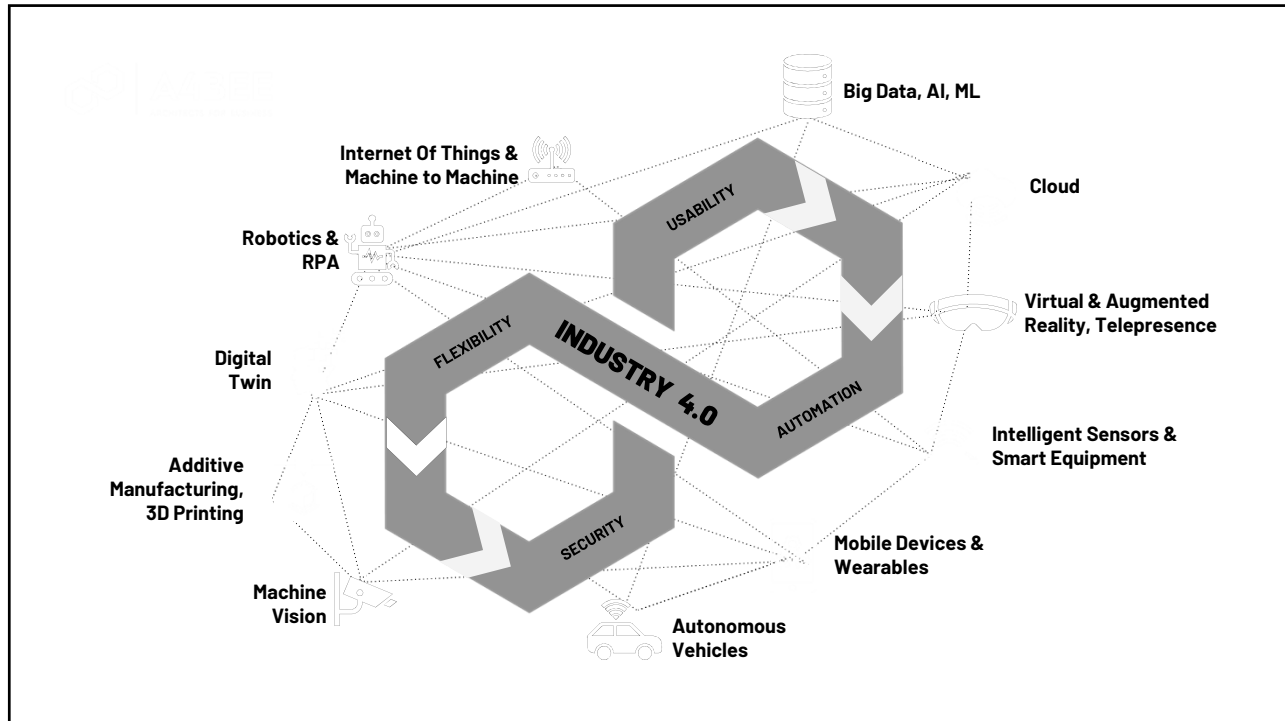
- Lower Costs
- Disposables consumables
- Reconfigurable shop floor
- Continuous Bioprocessing

IoT Promise

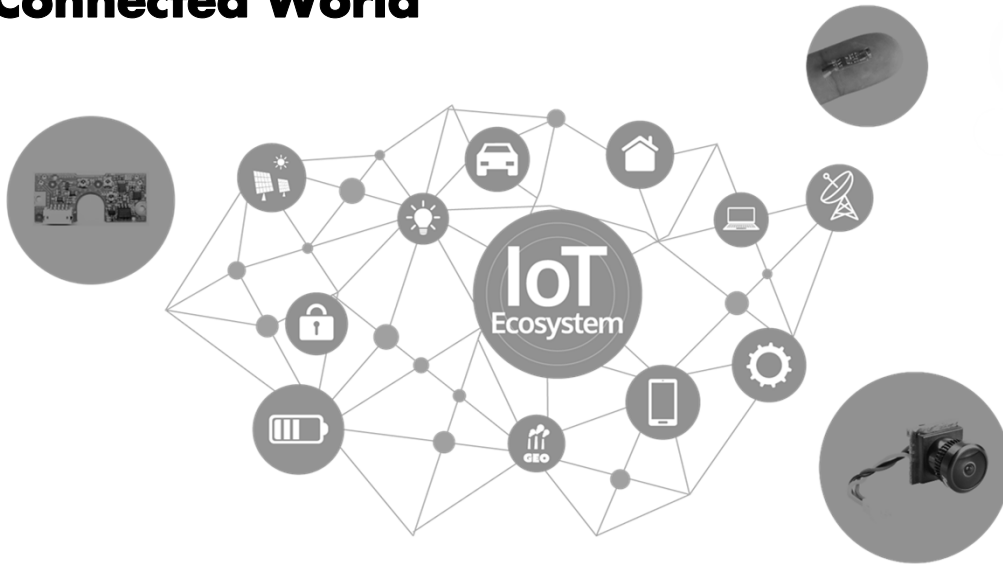
- Standardized, lower-cost technologies
- Auto-subscribing devices
- Smart eco-system with "location aware" devices
- Scalability from PD to Commercial

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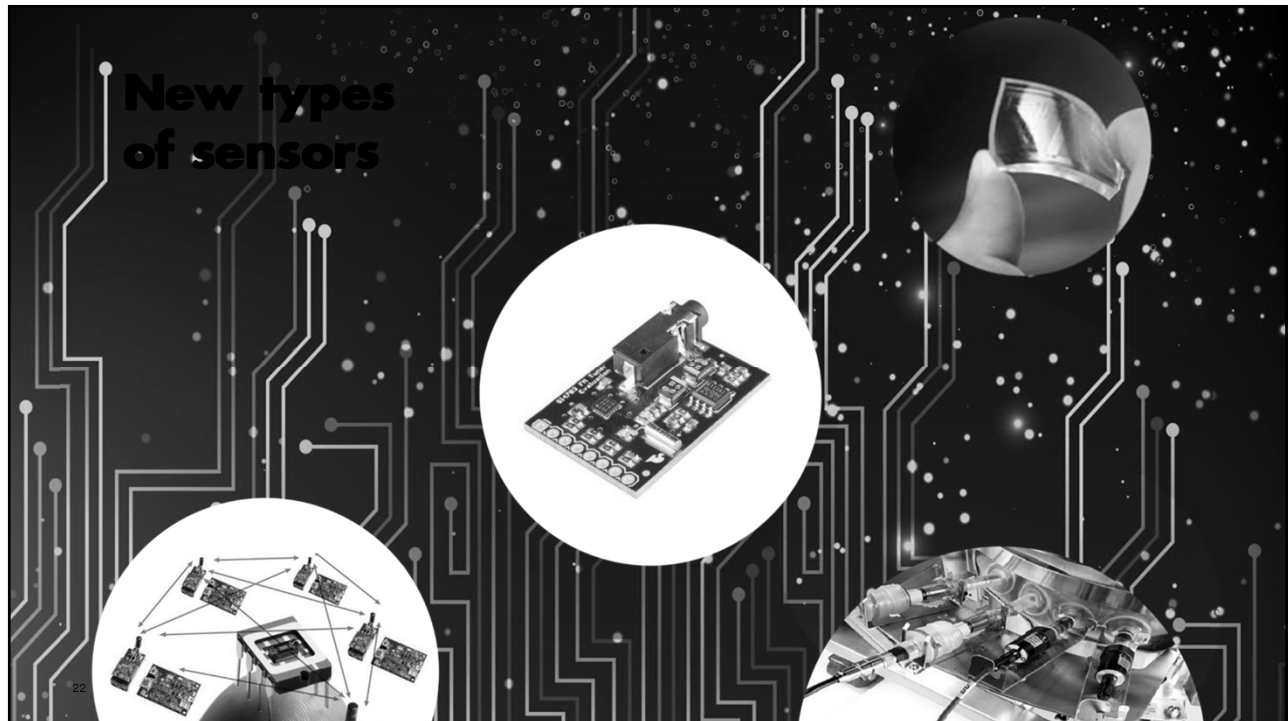


Connected World



21

New types of sensors



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IIoT Challenges



A Lack of 'Big Data' Open Standards Is Undermining Industry 4.0 Ambitions

11/02/2018 11:04am by Adam Byrne

G f t e +

Business Intelligence

In 2017, the UK government announced the 'Made Smarter Review', a proposal for Britain to lead the world in a new industrial revolution. The ambitious review, which runs alongside the UK government's Industrial

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Hot Trends & Digital Transformation

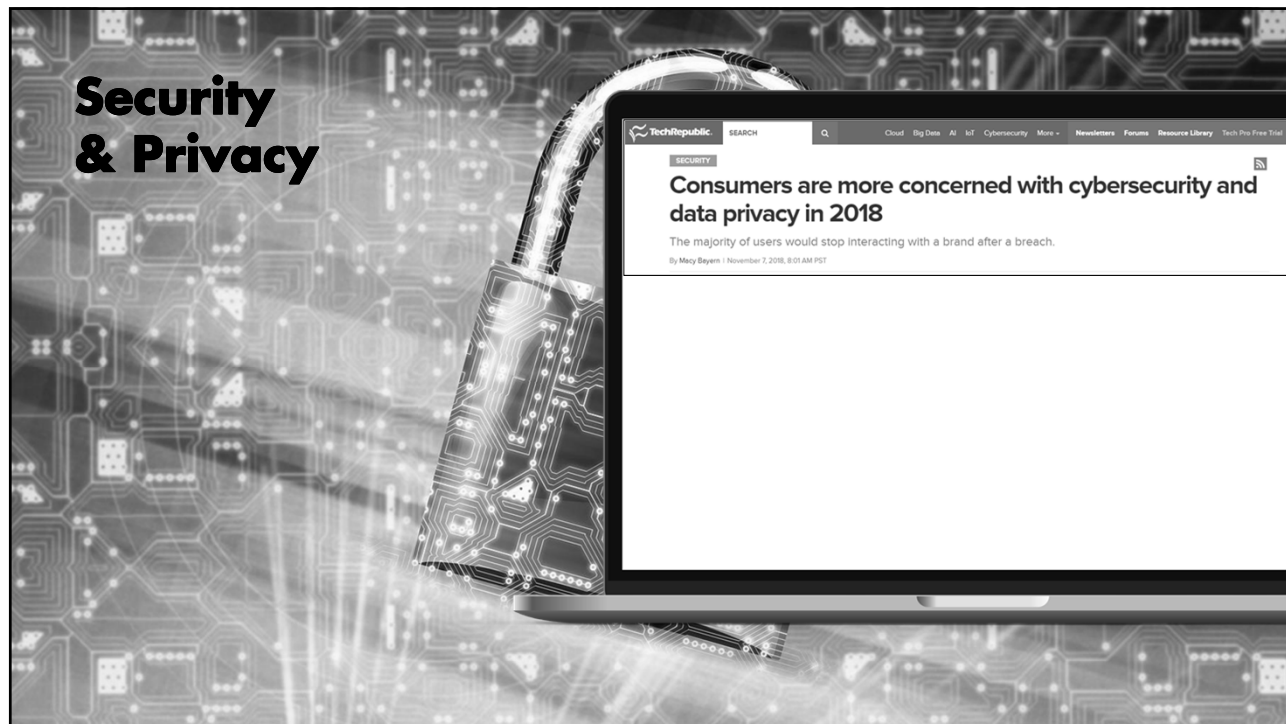
On Prem or Cloud?

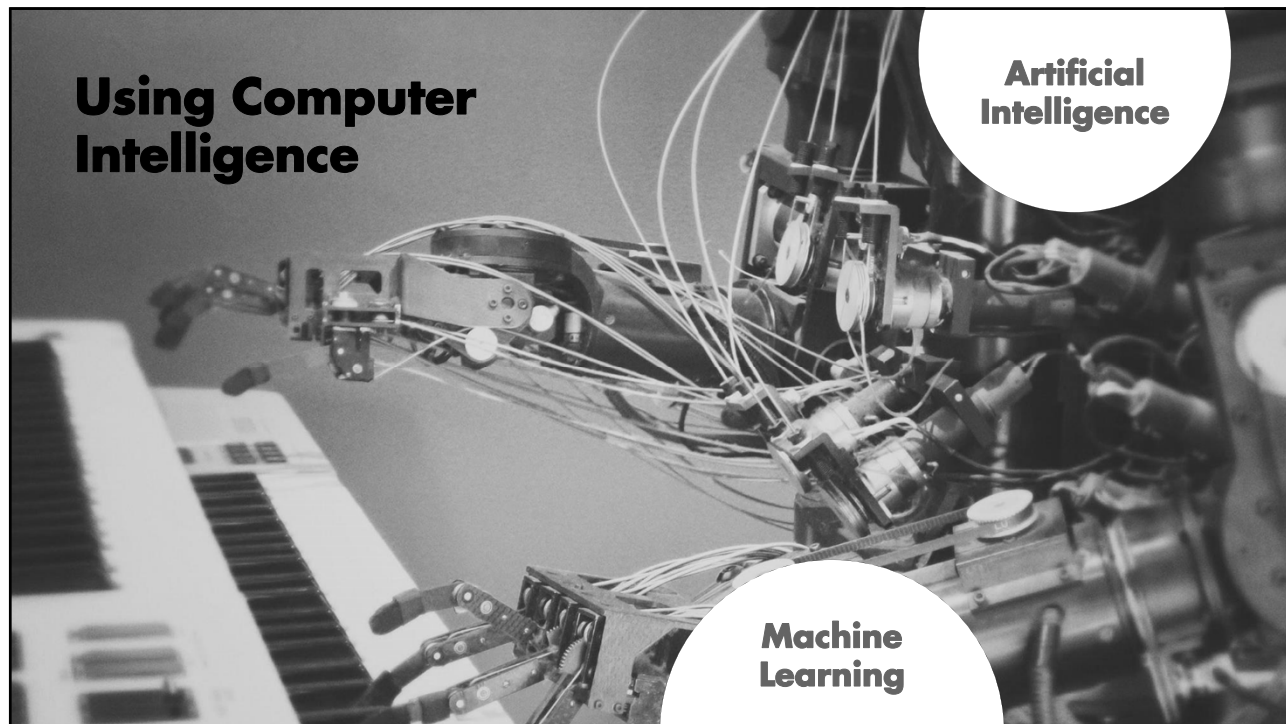


CLOUD COMPUTING

Mobile
 Storage
 Applications
 Server
 Database
 Private cloud
 Public cloud
 Hybrid cloud

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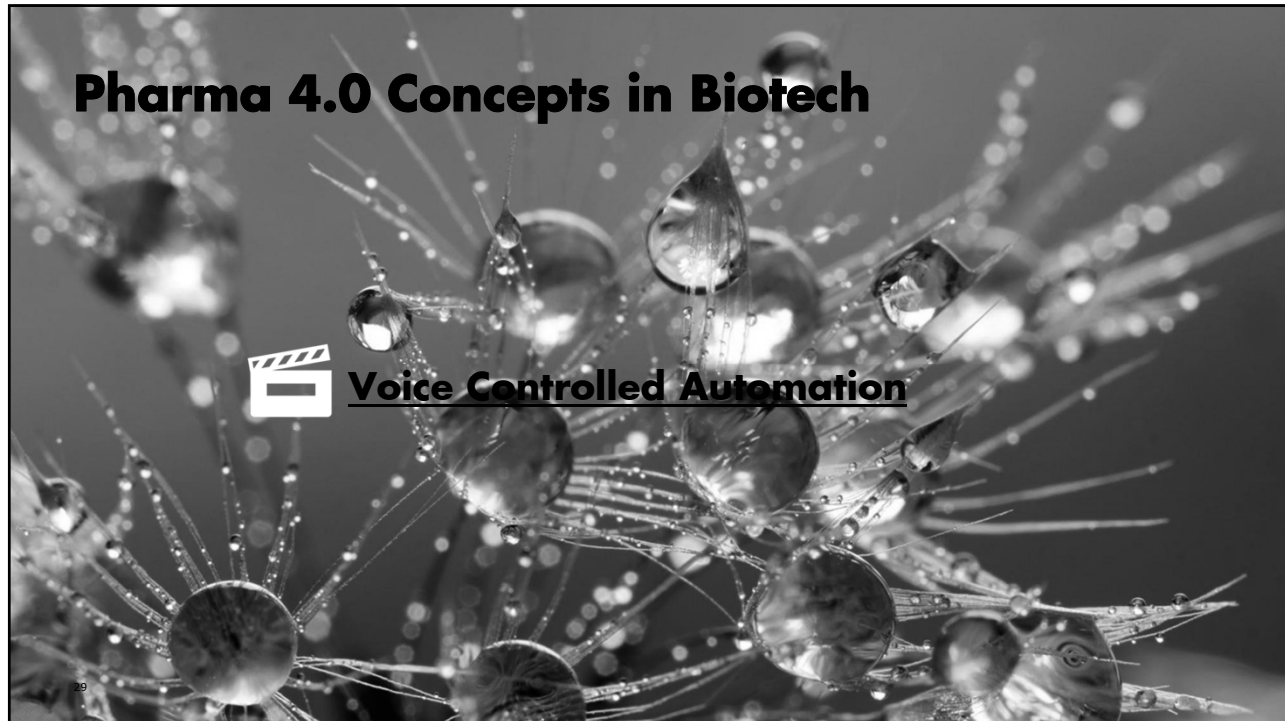




Pharma 4.0 Concepts in Biotech



Voice Controlled Automation



Data Itself Makes No Sense... We need INFORMATION!

Life during Industry 4.0

- Move production closer to customers
- Establish data standards for interoperability



Dr. Detlef Zuhlke, Executive Chairman of the SmartFactory
<https://www.manufacturingleadershipcouncil.com/2019/04/02/hannover-forum-says-data-holds-the-key-to-the-future-of-m4-0-and-beyond/>

Open Standards

THE *Open* GROUP

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Where Manufacturing Meets IT

AutomationWorld

The Importance of Open Standards

As the data from factories scales exponentially, the ability to access that data transparently becomes critical. If we want the Industrial Internet of Things to truly be a game changer for the manufacturing industry, open standards will be a major enabler of that transformation.

By Michael Bowne, Executive director, PI North America, on May 10, 2017

Lack of Big Data in Bioprocessing

SMALL DATA

VS.

BIG DATA

Using Large Sets of Small Data



**Progress & Disruption
are driven by people,
not by technology**





**Thank you
for listening**

Joel Nichols

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#biotech #manufacturing #digitization
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