IOT E WIRELESS COME STRUMENTI PER UN EFFICIENTAMENTO 4.0

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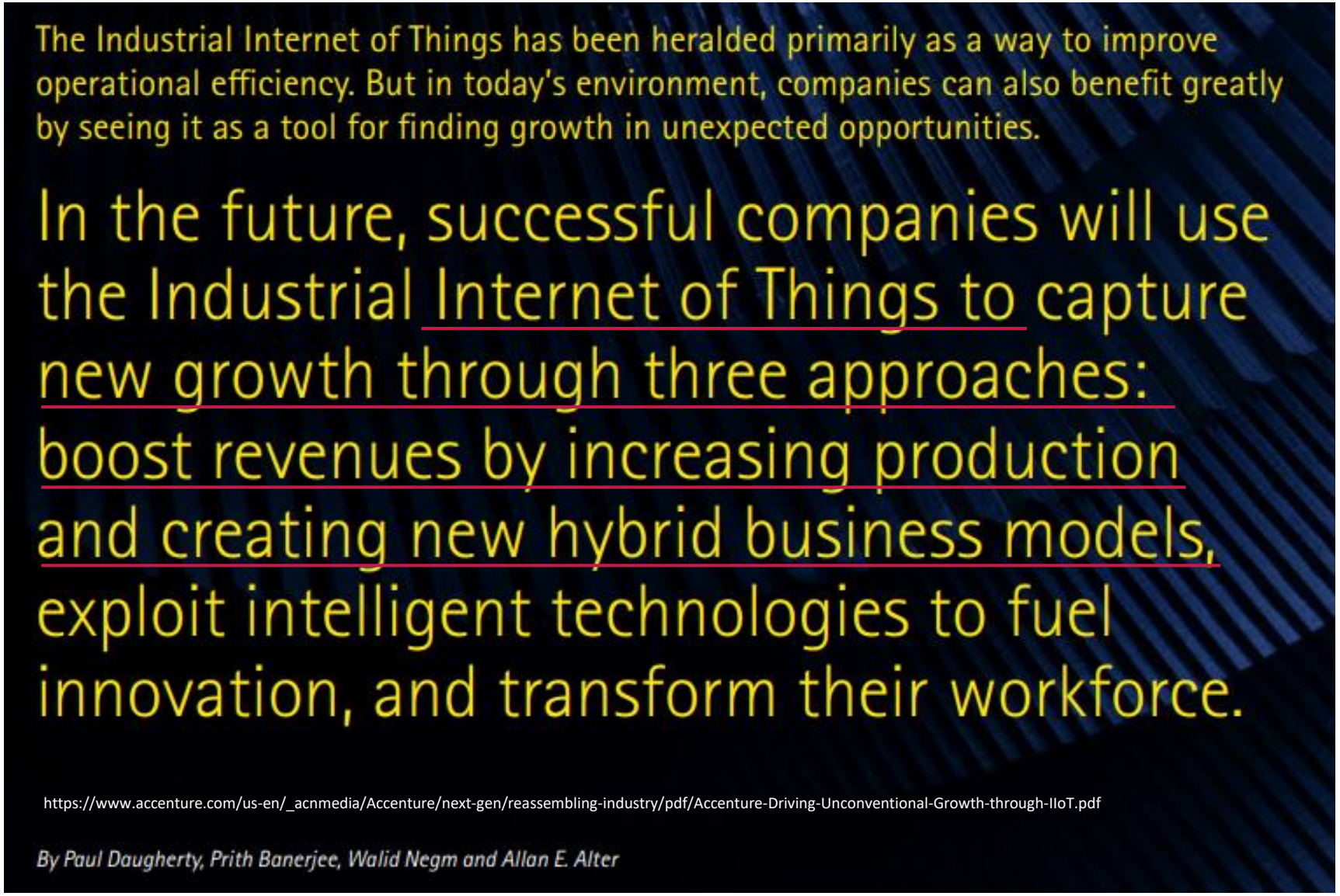
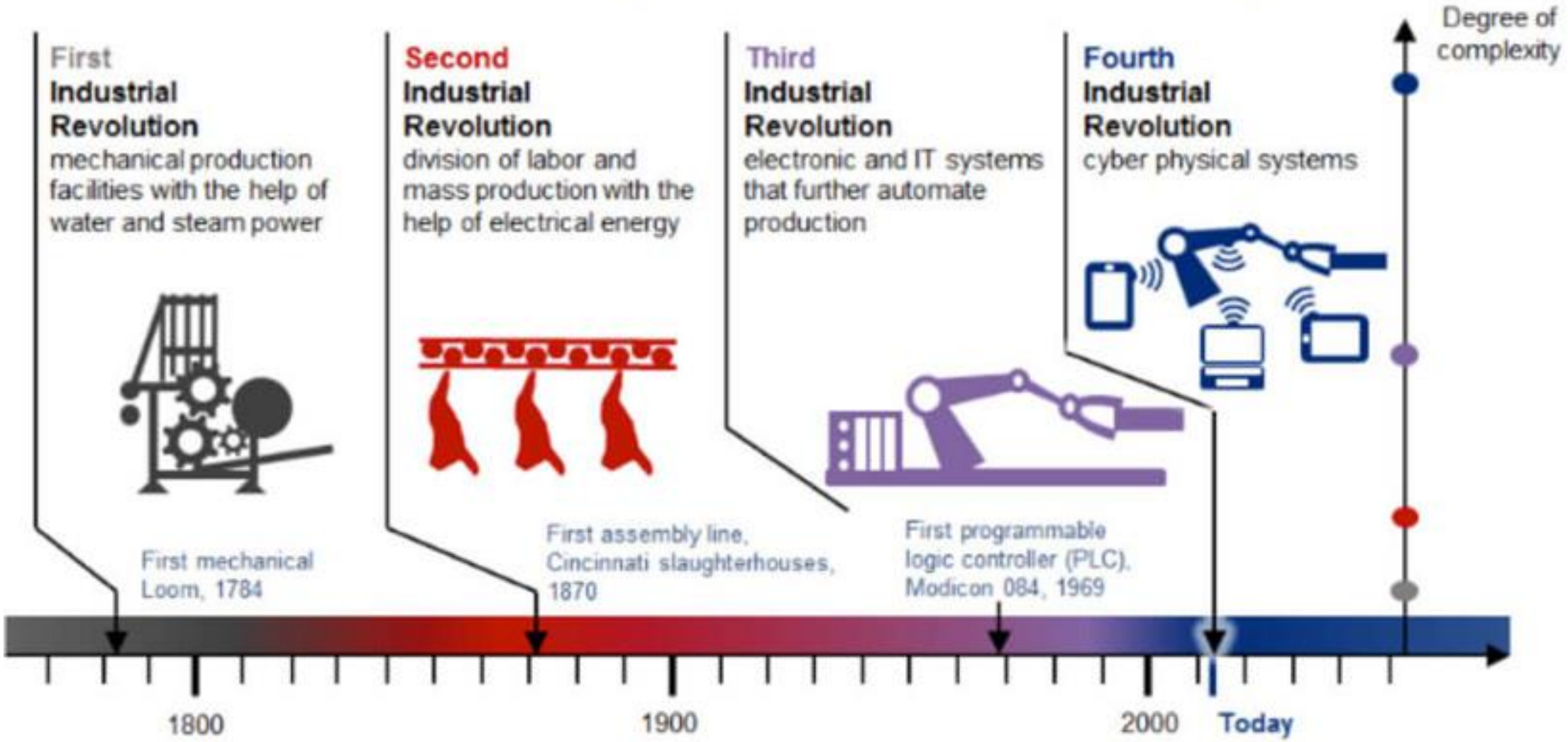
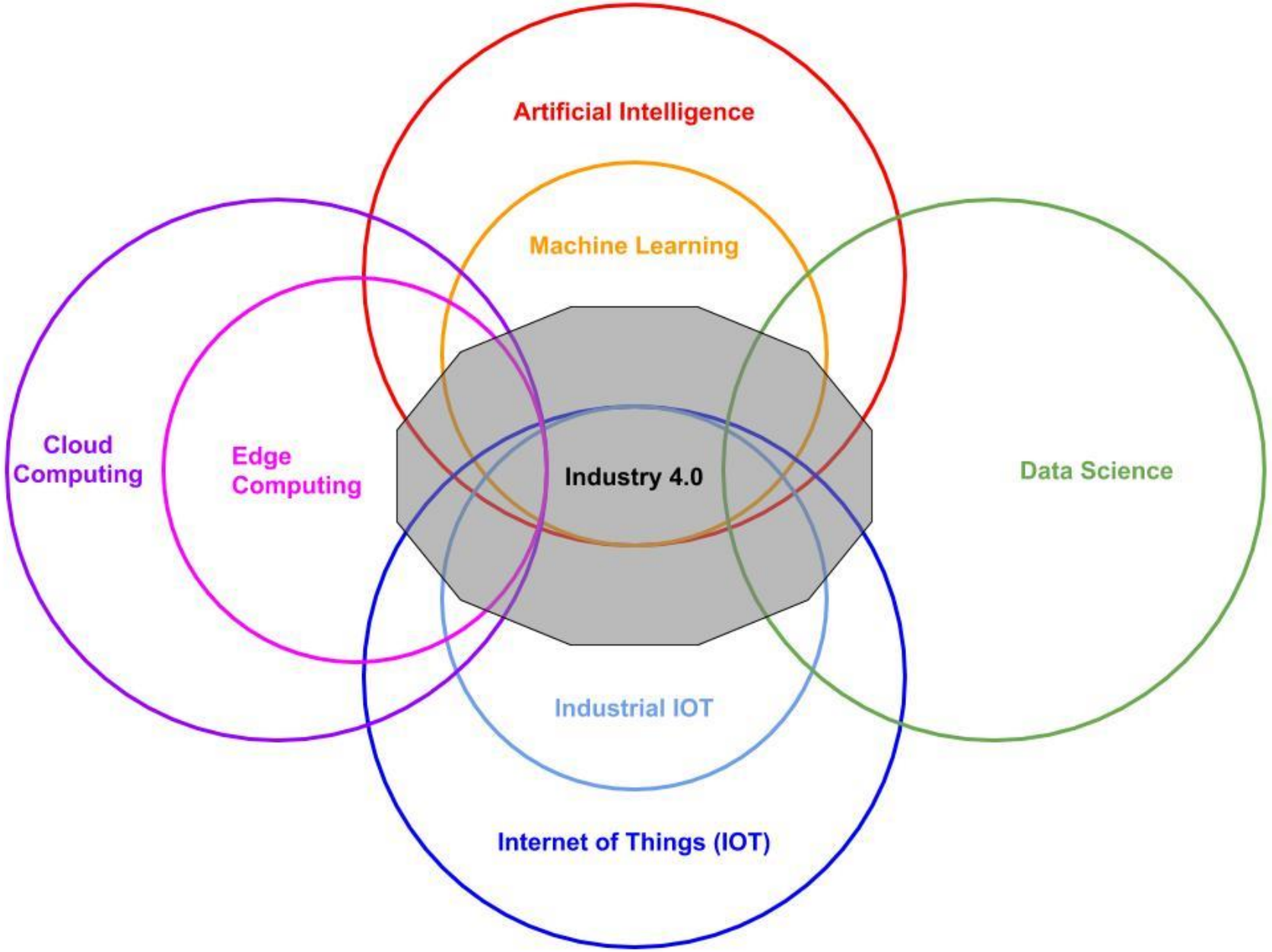
INDUSTRY 4.0


The Industrial Internet of Things has been heralded primarily as a way to improve operational efficiency. But in today's environment, companies can also benefit greatly by seeing it as a tool for finding growth in unexpected opportunities.
In the future, successful companies will use the Industrial Internet of Things to capture new growth through three approaches: boost revenues by increasing production and creating new hybrid business models, exploit intelligent technologies to fuel innovation, and transform their workforce.
https://www.accenture.com/us-en/_acnmedia/Accenture/next-gen/reassembling-industry/pdf/Accenture-Driving-Unconventional-Growth-through-IIoT.pdf
By Paul Daugherty, Prith Banerjee, Walid Negm and Allan E. Alter

From Industry 1.0 to Industry 4.0



4.0 HOLISTIC VISION



DIGITAL TWIN

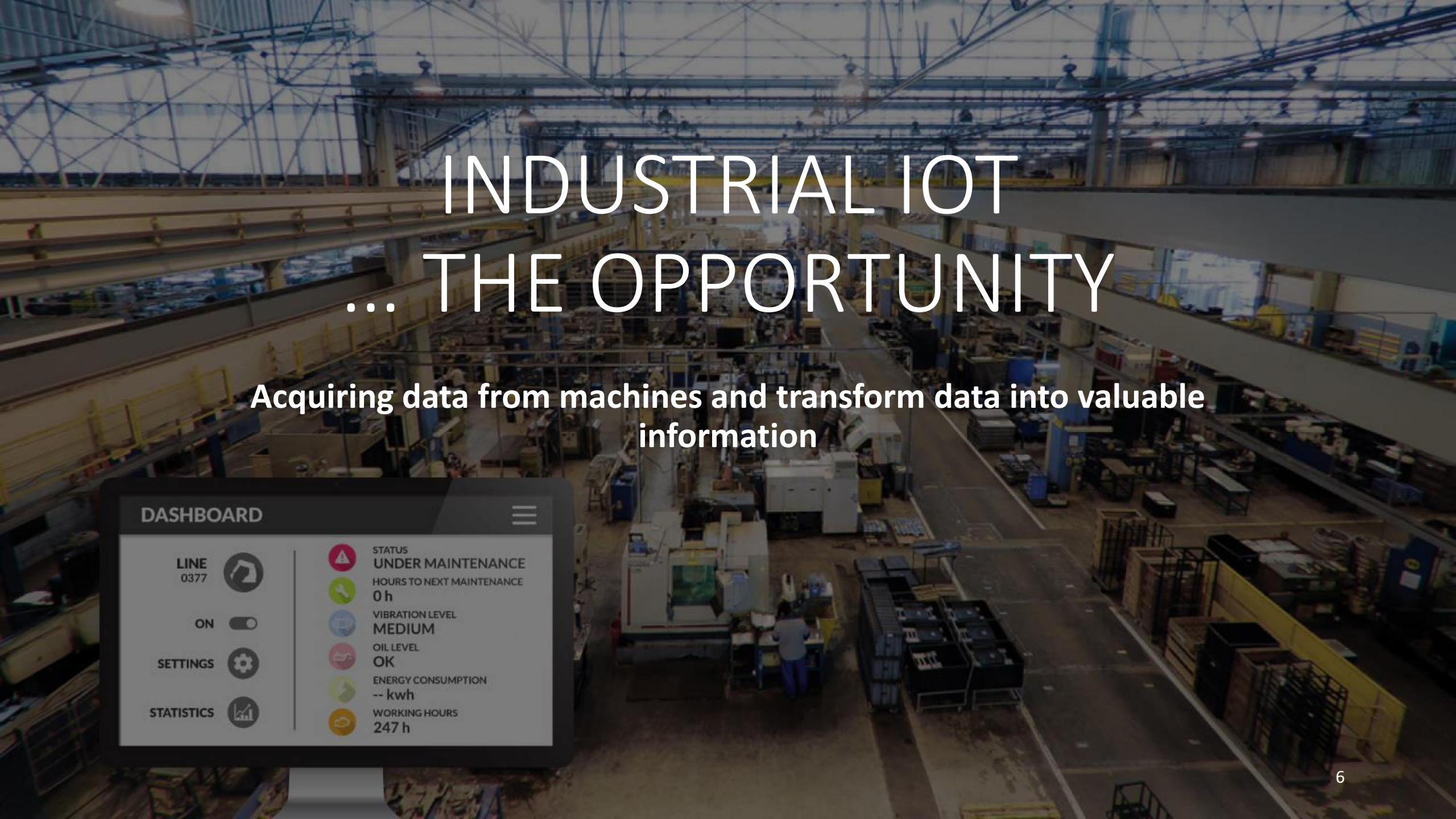
A digital twin is a digital replica of a physical entity.

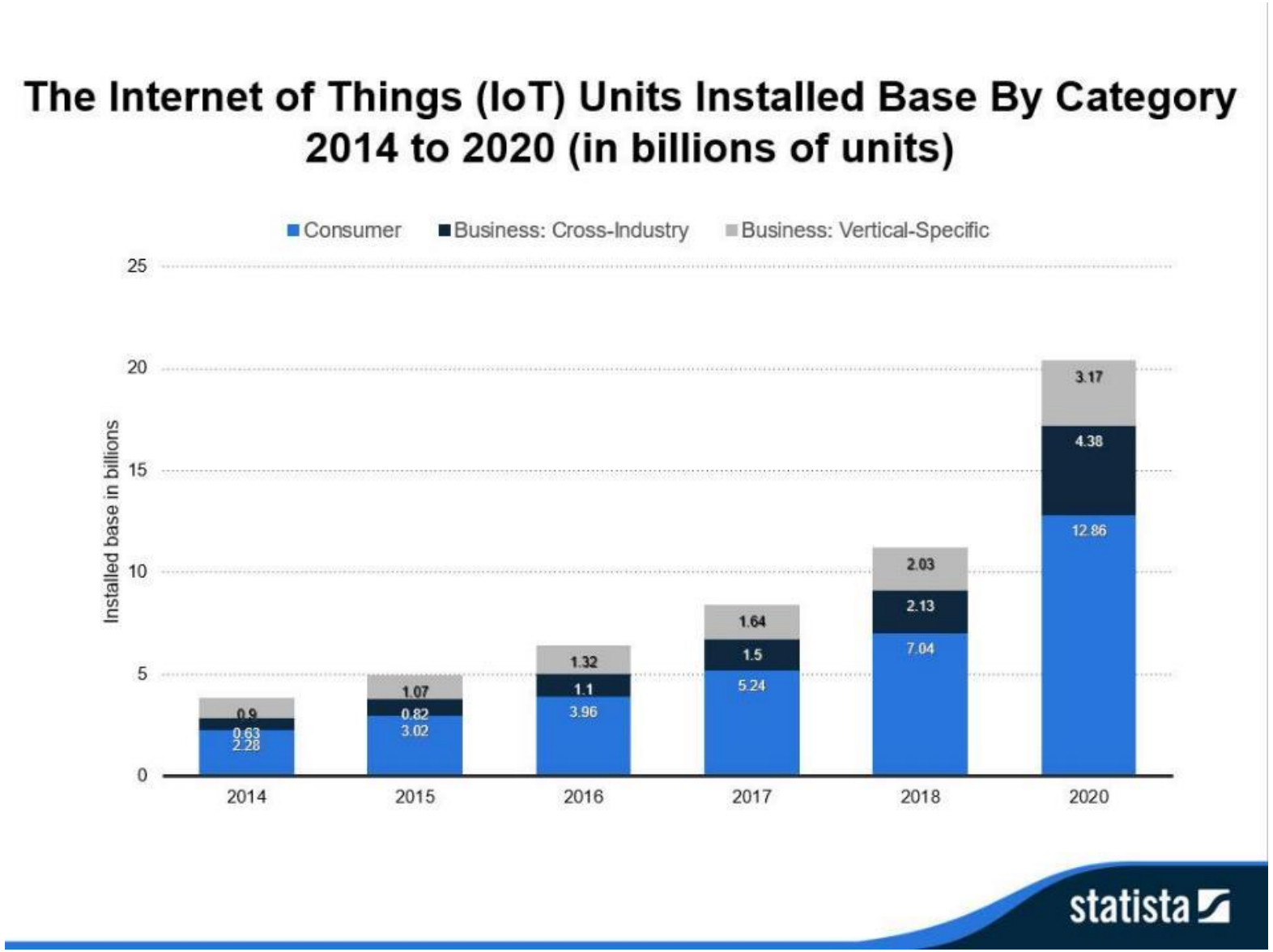
By bridging the physical and the virtual world, data is transmitted seamlessly allowing the virtual entity to exist simultaneously with the physical entity.

Digital twin refers to a digital replica of physical assets, processes, people, places, systems and devices that can be used for various purposes.

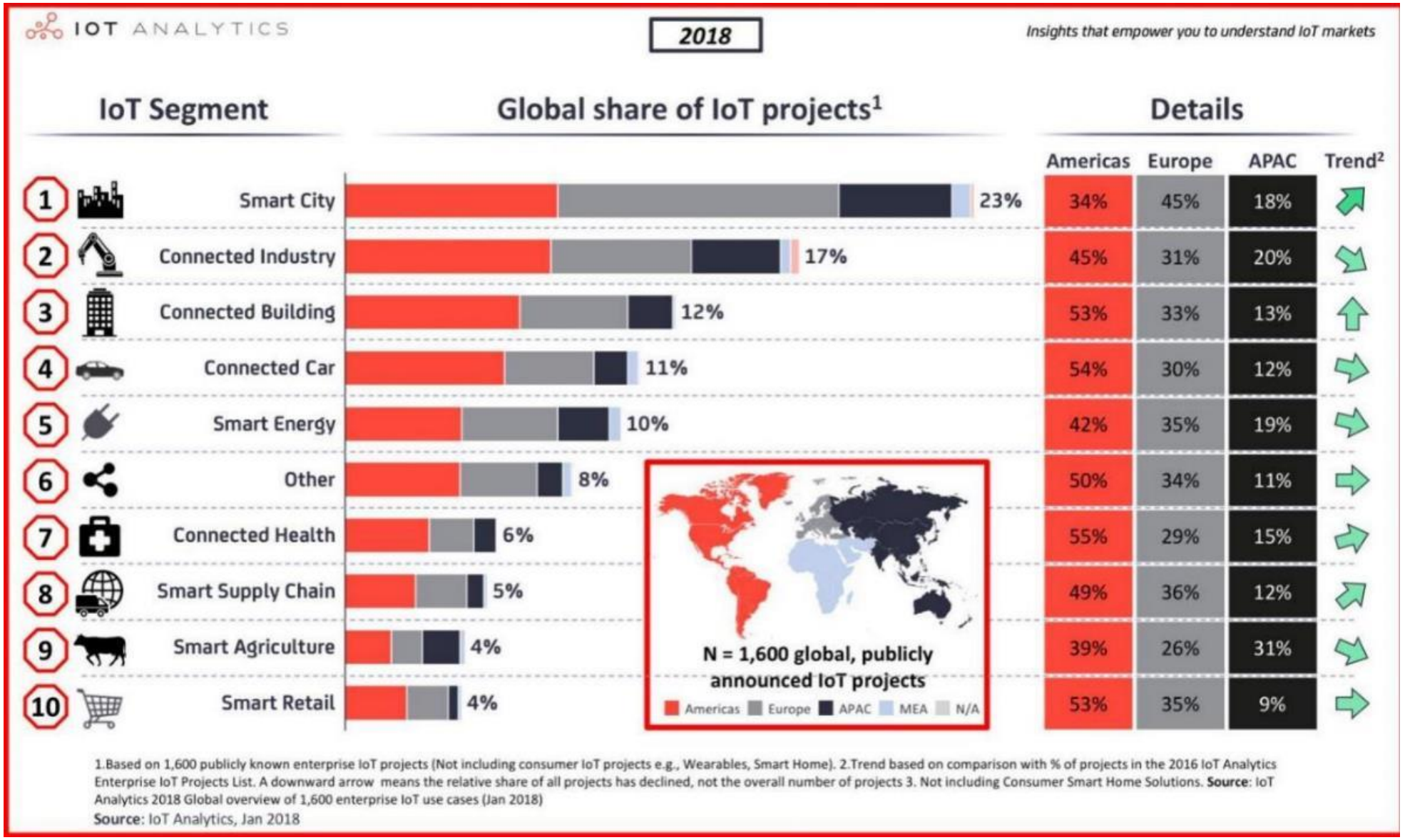
INDUSTRIAL IOT
… THE OPPORTUNITY

Acquiring data from machines and transform data into valuable information





https://www.forbes.com/sites/louiscolumbus/2018/06/06/10-charts-that-will-challenge-your-perspective-of-iots-growth/#ce3f6623ecce

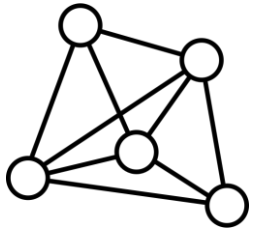


https://www.forbes.com/sites/louiscolumbus/2018/06/06/10-charts-that-will-challenge-your-perspective-of-iots-growth/#ce3f6623ecce

INDUSTRIAL IOT: THE CHALLENGES

Replacing existing machines can be very expensive

IoT Gateways are useless for machines without a PLC



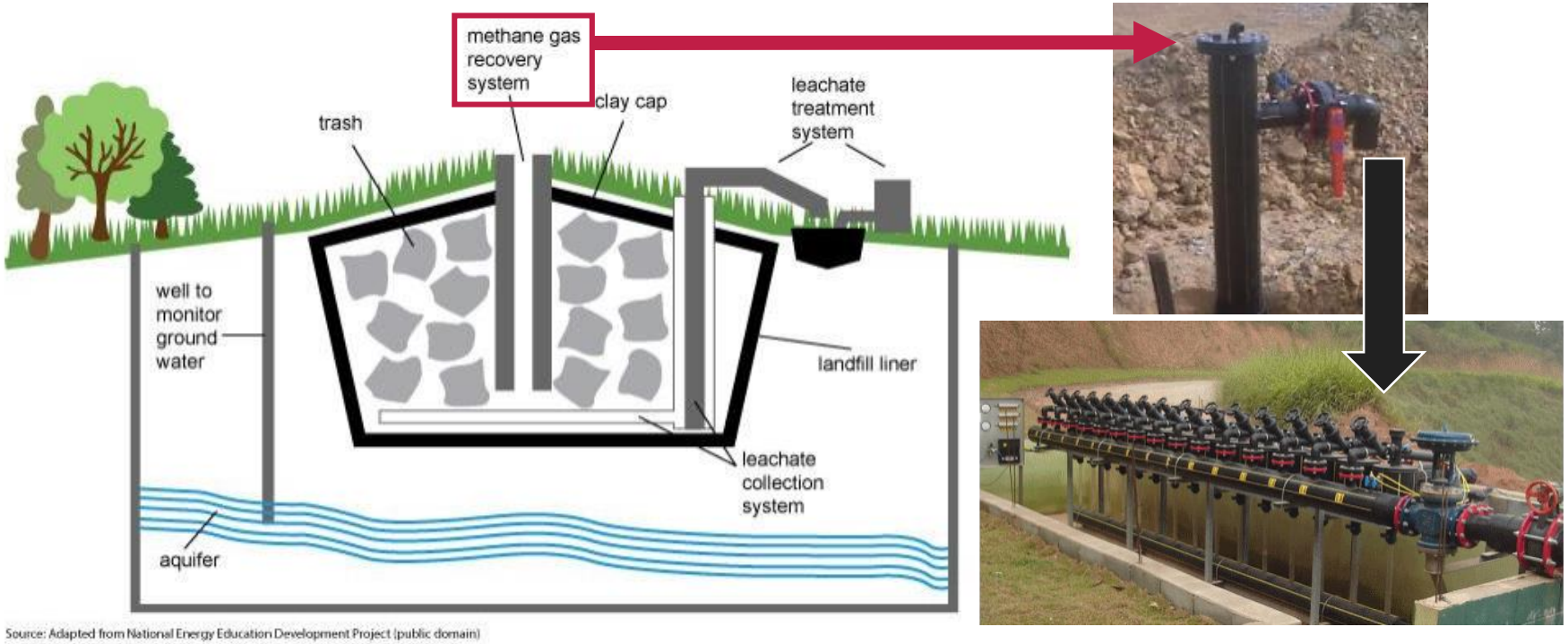
Communication between machines and PLCs is difficult and often locked by vendors

IoT Software solutions are poorly integrable with existing ERP/MES and often cloud-only

CASE STUDY 1

BIOGAS MONITORING IN A LANDFILL

BIOGAS PRODUCTION MONITORING IN A LANDFILL



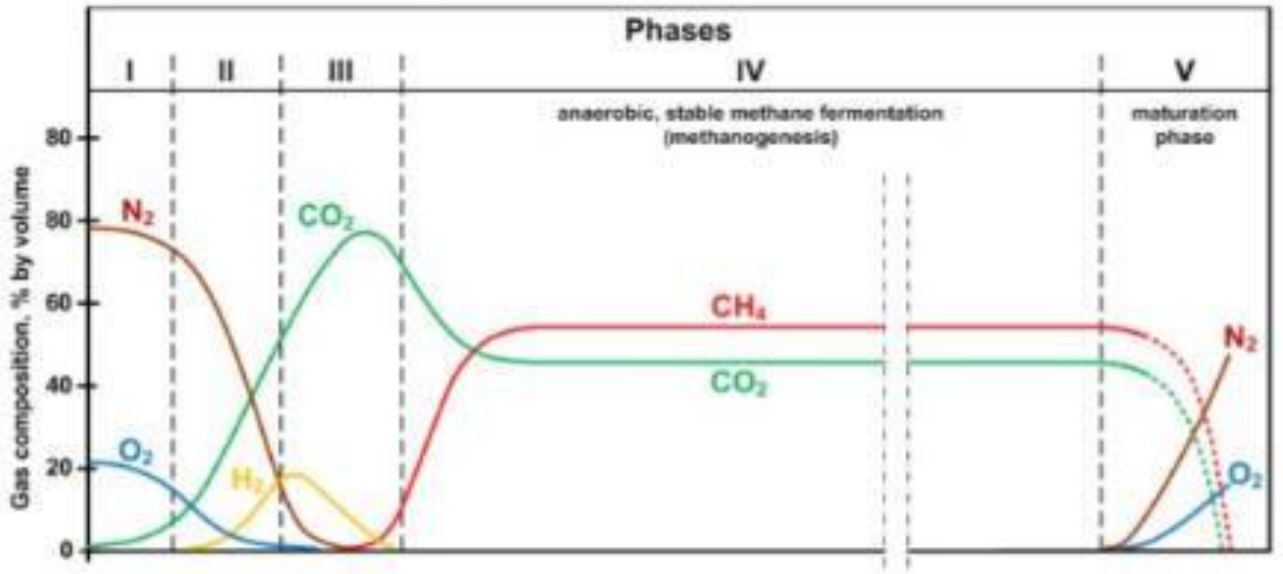
Source: Adapted from National Energy Education Development Project (public domain)

BIOGAS PRODUCTION MONITORING IN A LANDFILL

Generation of LFG

HOFSTETTER GASTECHNIK AG

The 5 phases of Landfills life



I = Initial adjustment, aerobic conditions
II = Transition phase, begin of anaerobic decomposition
III = Acid phase, hydrolisis and acidogenesis
IV = Metane fermentation phase, strictly anaerobic, methanogenesis
V = Maturation phase: air intake, methane oxydation to CO_2 and air phase

6

BIOGAS PRODUCTION MONITORING IN A LANDFILL

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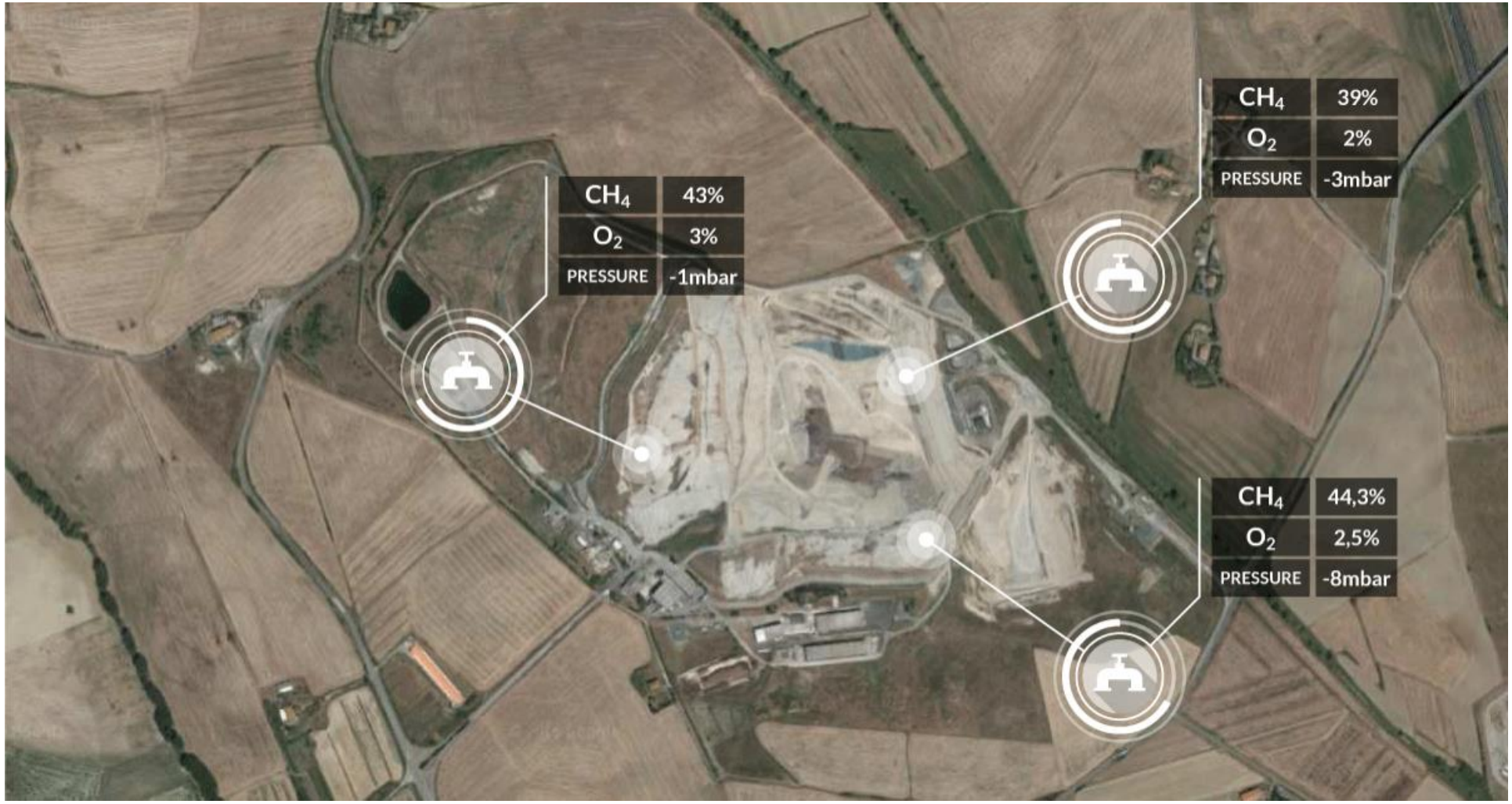


BIOGAS PRODUCTION MONITORING IN A LANDFILL

O_2

CH_4

Mbar

°C

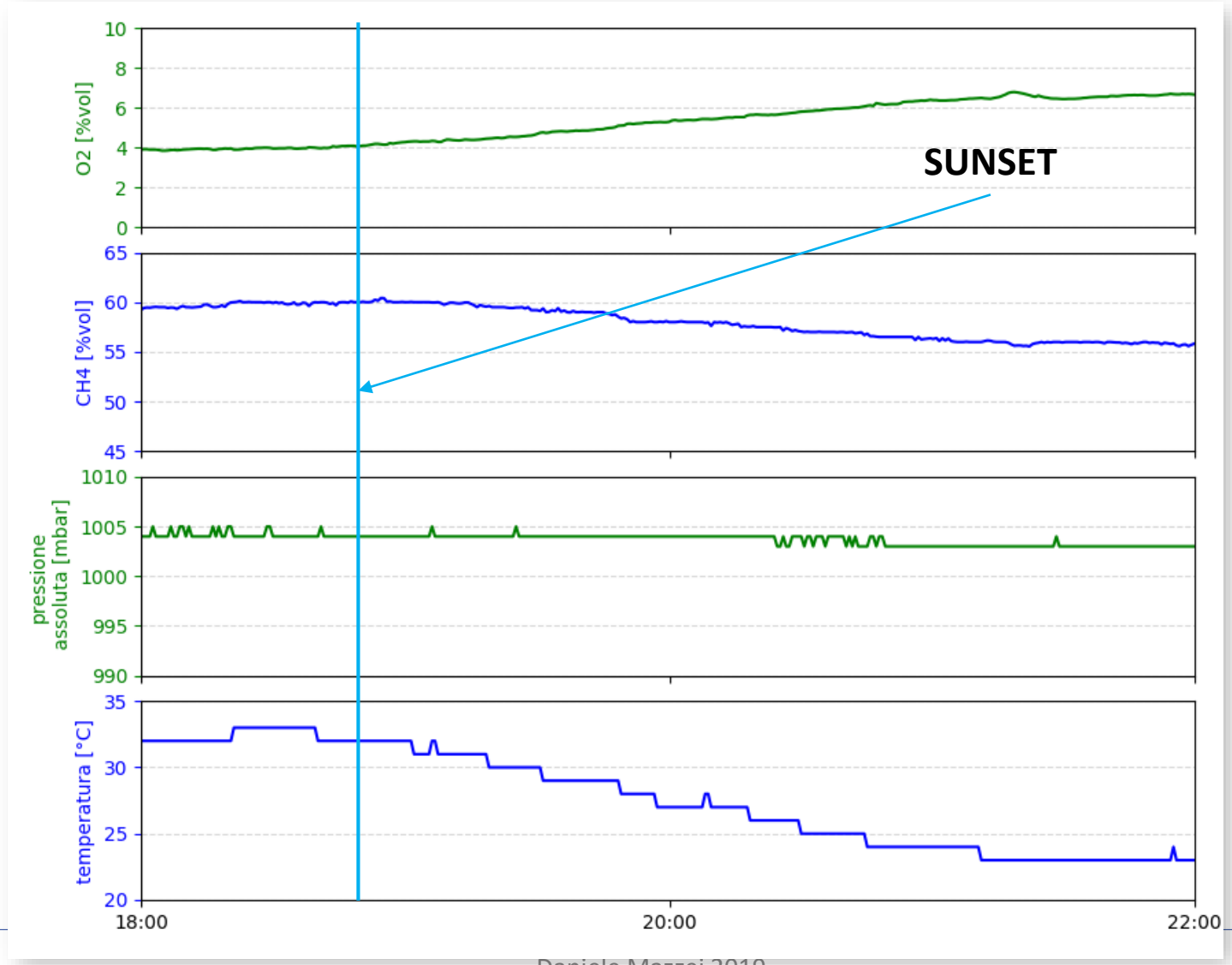
BIOGAS PRODUCTION MONITORING IN A LANDFILL

O_2

CH_4

Mbar

°C



BIOGAS PRODUCTION MONITORING IN A LANDFILL

Temperature Effects in Anaerobic Digestion Modeling

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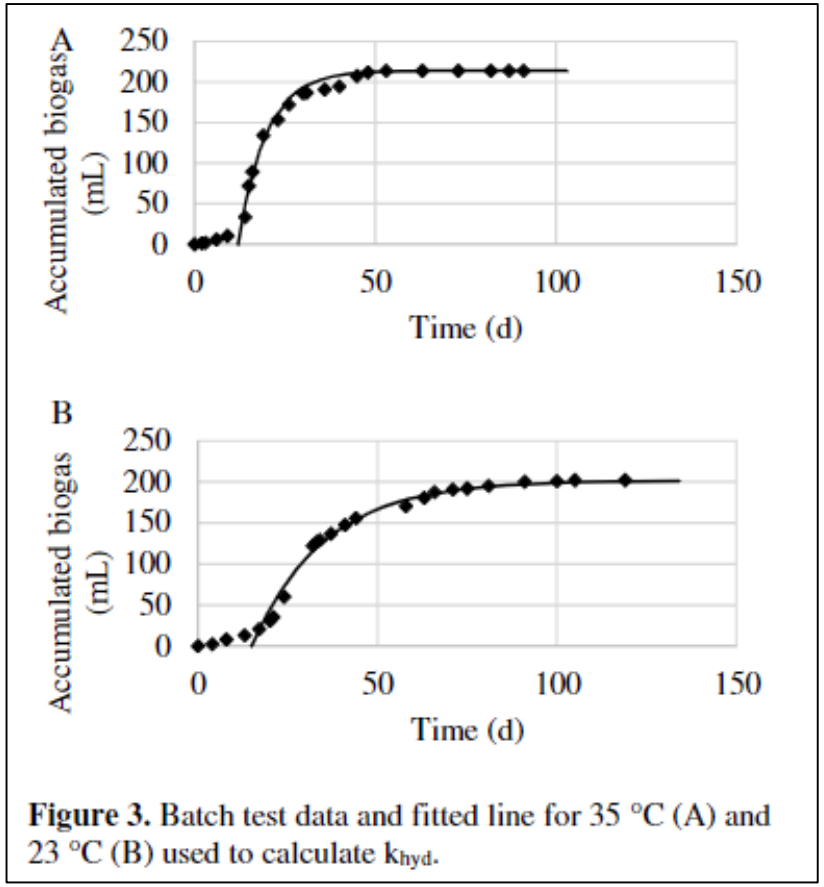
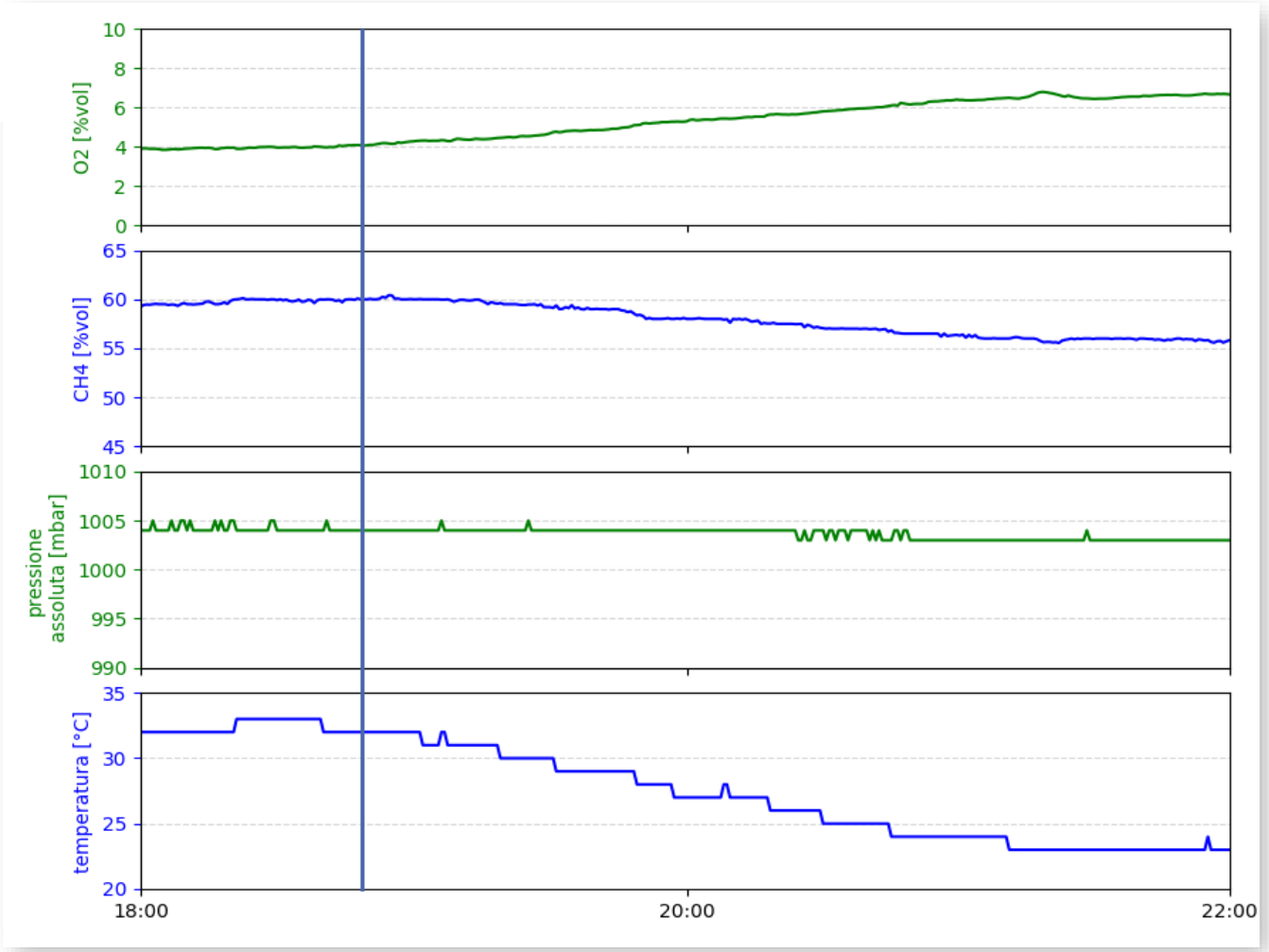


Figure 3. Batch test data and fitted line for 35 °C (A) and 23 °C (B) used to calculate k_{hyd}.

Sunset



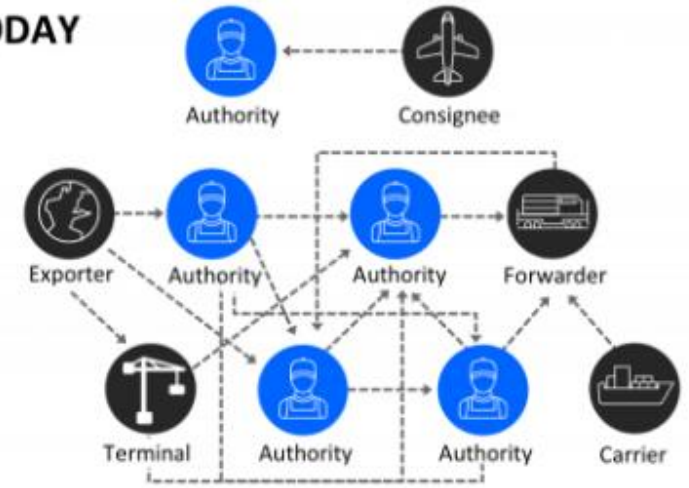
CASE STUDY 2

BLOCKCHAIN POWERED ASSET TRACKING

Supply Chain

Digitizing Global Trade with Maersk and IBM

TODAY

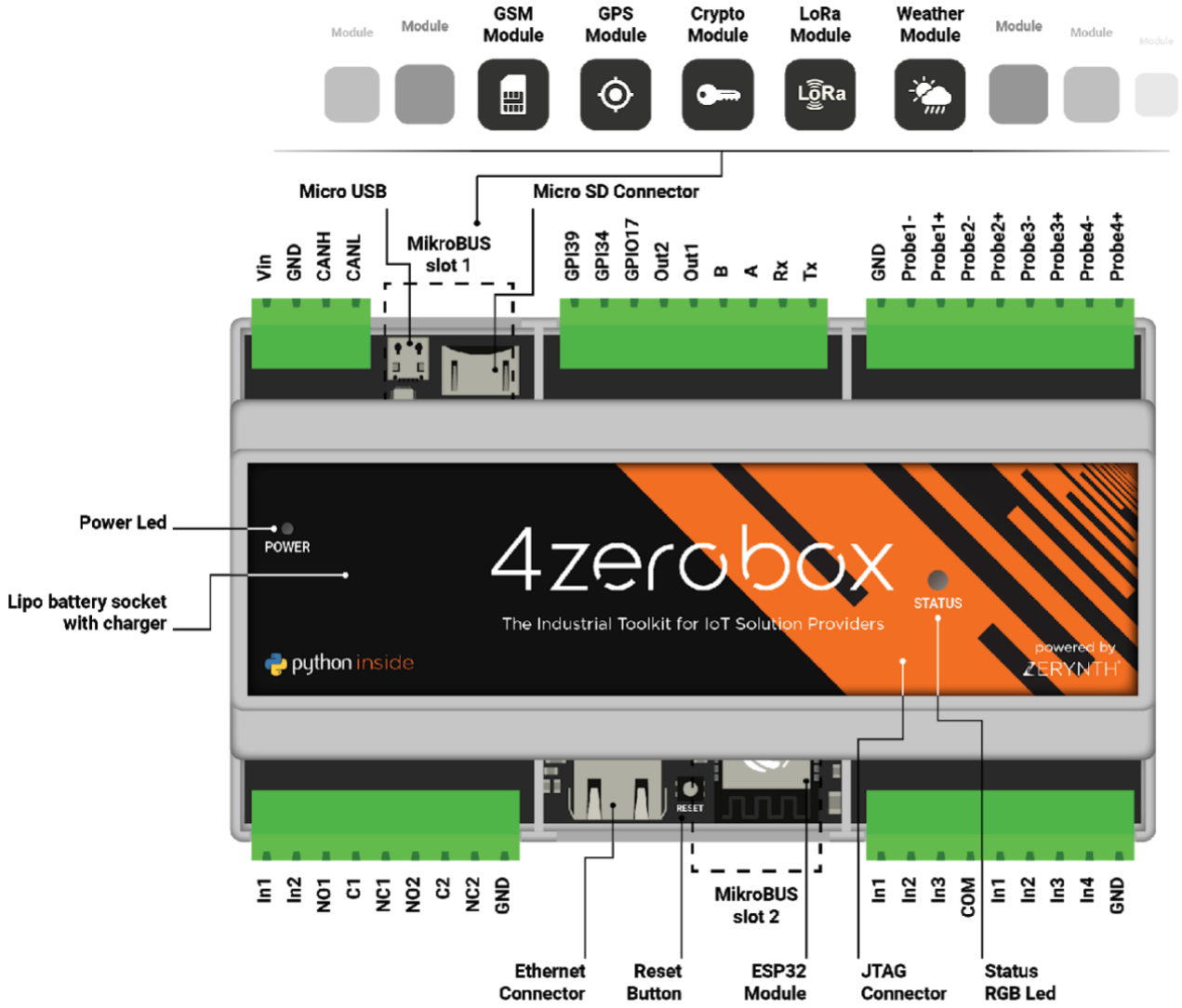


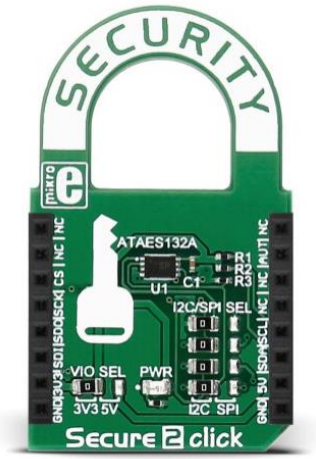
- Inconsistent information across organizational boundaries and "blind spots" throughout the supply chain hinder the efficient flow of goods
- Complex, cumbersome, and costly peer-to-peer messaging
- Manual, time-consuming, paper-based processes
- Risk assessments often lack sufficient information; clearance processes subject to fraud
- The administrative cost of handling a container shipment is comparable to the cost of the actual physical transport

FUTURE

- Fast, secure access to end-to-end supply chain information; single source of the truth
- Verifiable authenticity and immutability of digital documents
- Trusted cross-organizational workflows
- Better risk assessments and fewer unnecessary interventions
- Far lower administrative expenses and elimination of costs to move physical paper across international borders

BLOCKCHAIN POWERED ASSET TRACKING





BLOCKCHAIN POWERED ASSET TRACKING

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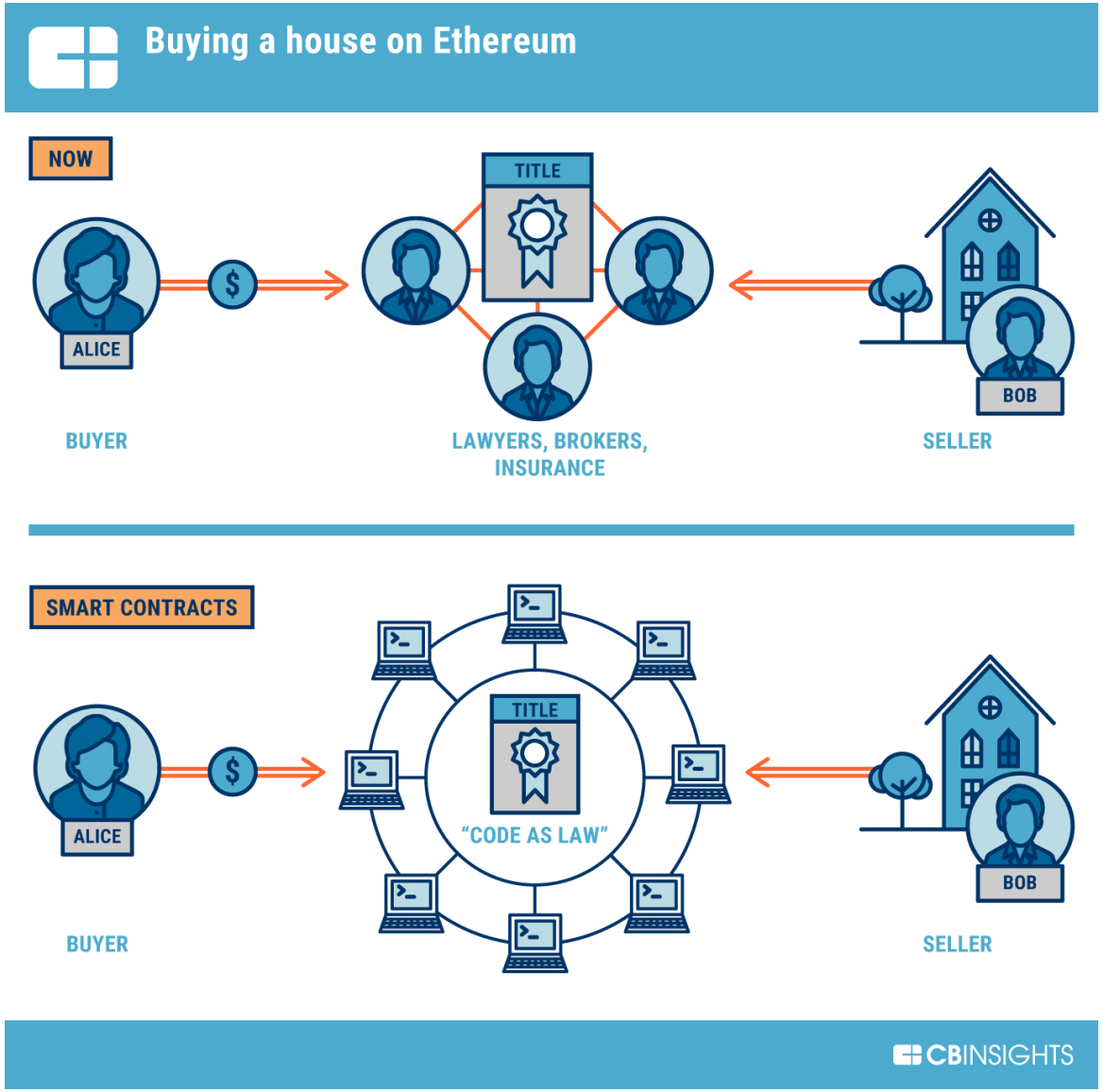

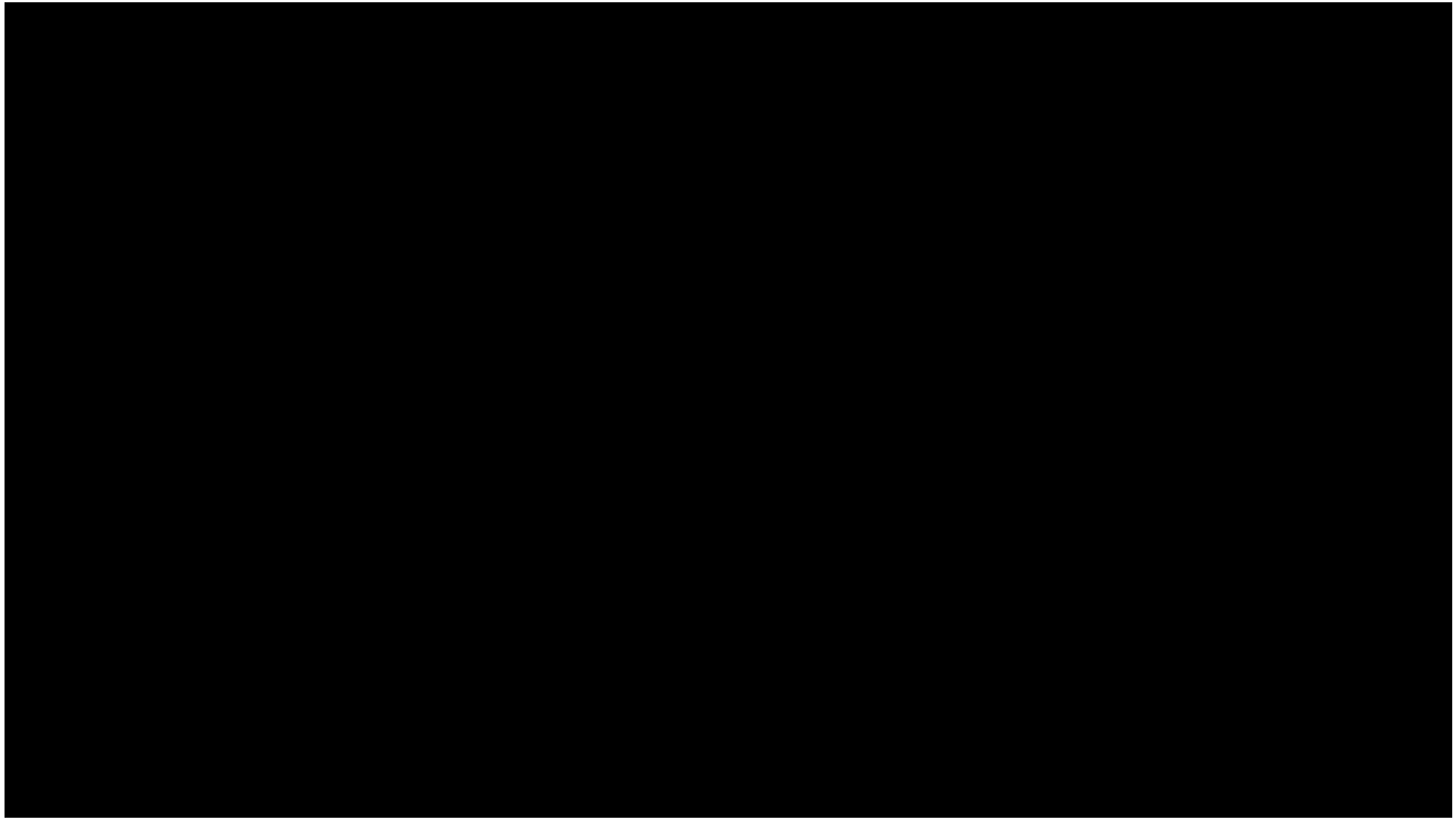

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Daniele Mazzei 2019

3/4/2019