



equinor

# 12 Disruptive Technologies Shaping the Future of Equinor

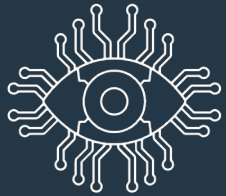
Harald Wesenberg  
Tekna Big Data & Tekna Oil and Gas, December 1st, 2020



The opinions in this presentation  
are my own

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<https://www.loop.equinor.com/>

# 12 Disruptive Technologies



Sensors



Internet of Things



Robotics



Blockchain



Analytics



Artificial Intelligence



Virtual Reality



Cloud computing



Hydrogen



Distributed Solar



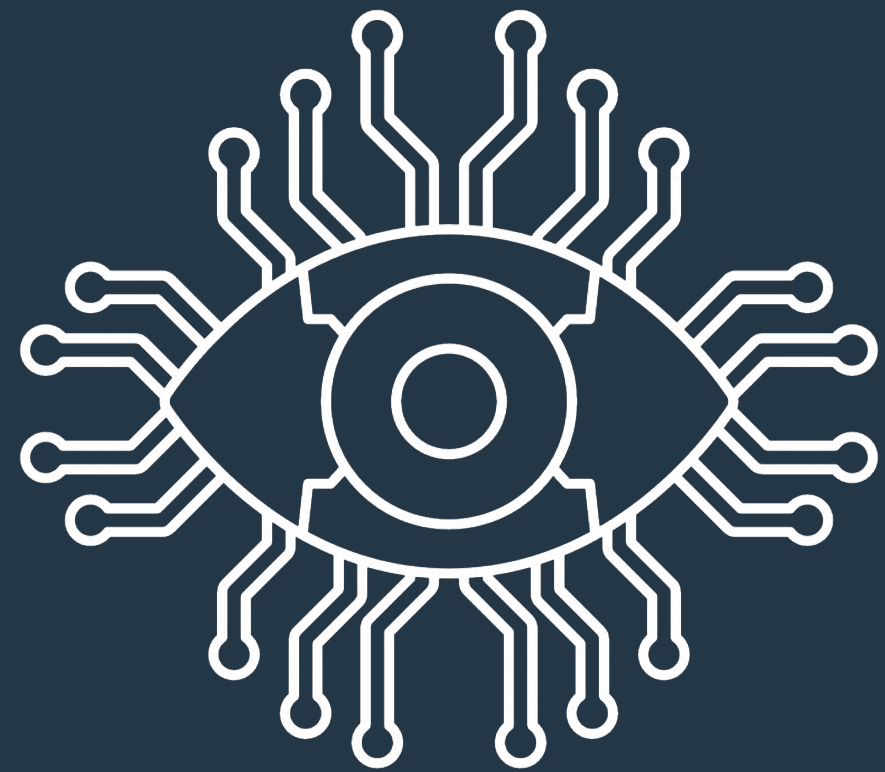
Carbon capture and storage



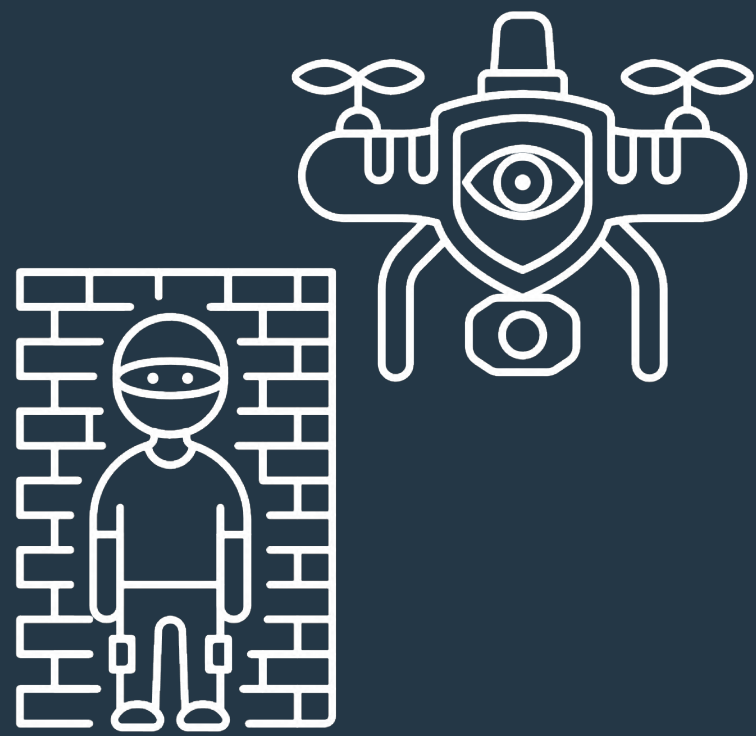
Batteries



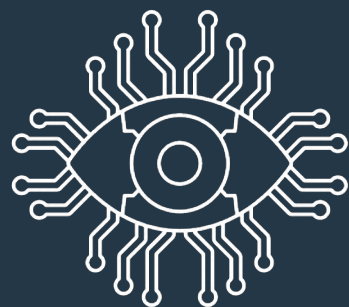
This is about what CAN be



# Sensors



# Sensing at a new level



Computer Vision



Computer Hearing



Industrial sensors



Wearable Sensors



## Scoping Out a Smarter Future

[Python3] [Raspberry Pi] [Phidget]

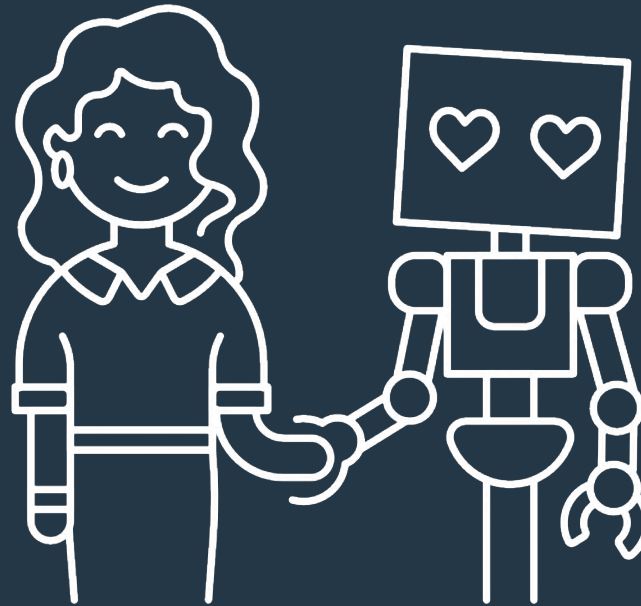
Ready for the SmartScope saga? What started as a simple idea evolved into a tale of the high seas, with marine life aplenty and a little bit of software ingenuity. Now, it's making life easier for people at sea.

<https://www.loop.equinor.com/en/stories/smartscope.html>





# Internet of Things



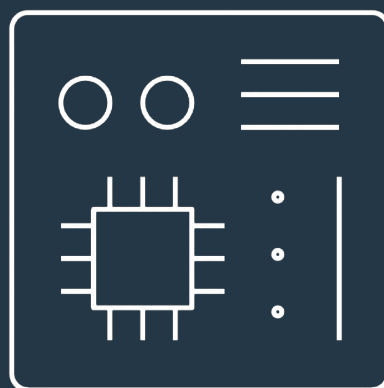
# Bridging the virtual and the physical world



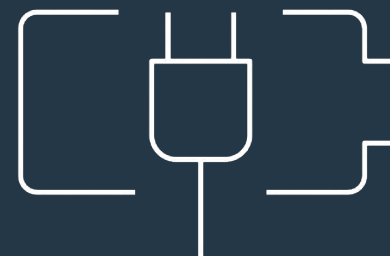
Cheaper sensors



Global connectivity



Edge computing



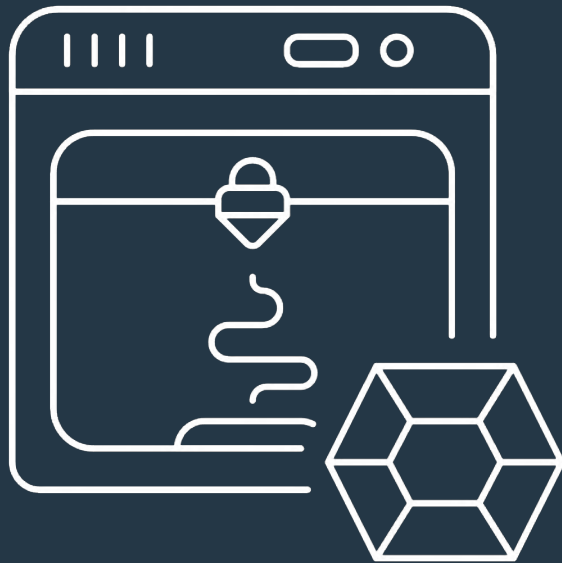
Low power



# Robotics



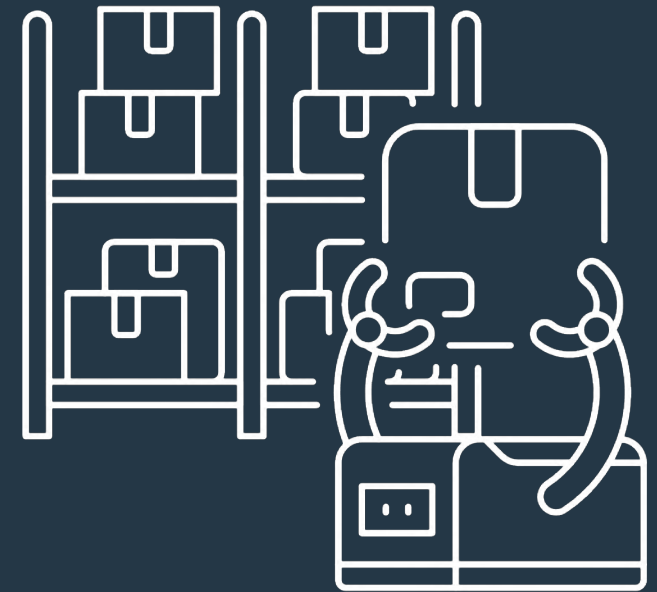
# Replacing distribution



3D Printing



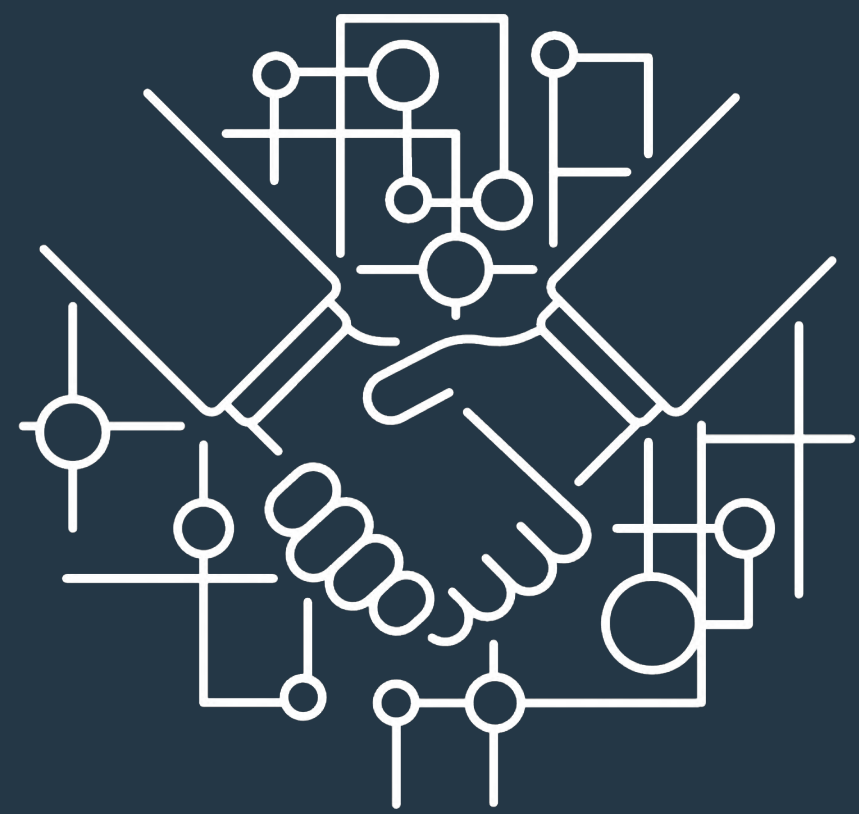
Self-driving  
cars



Logistics

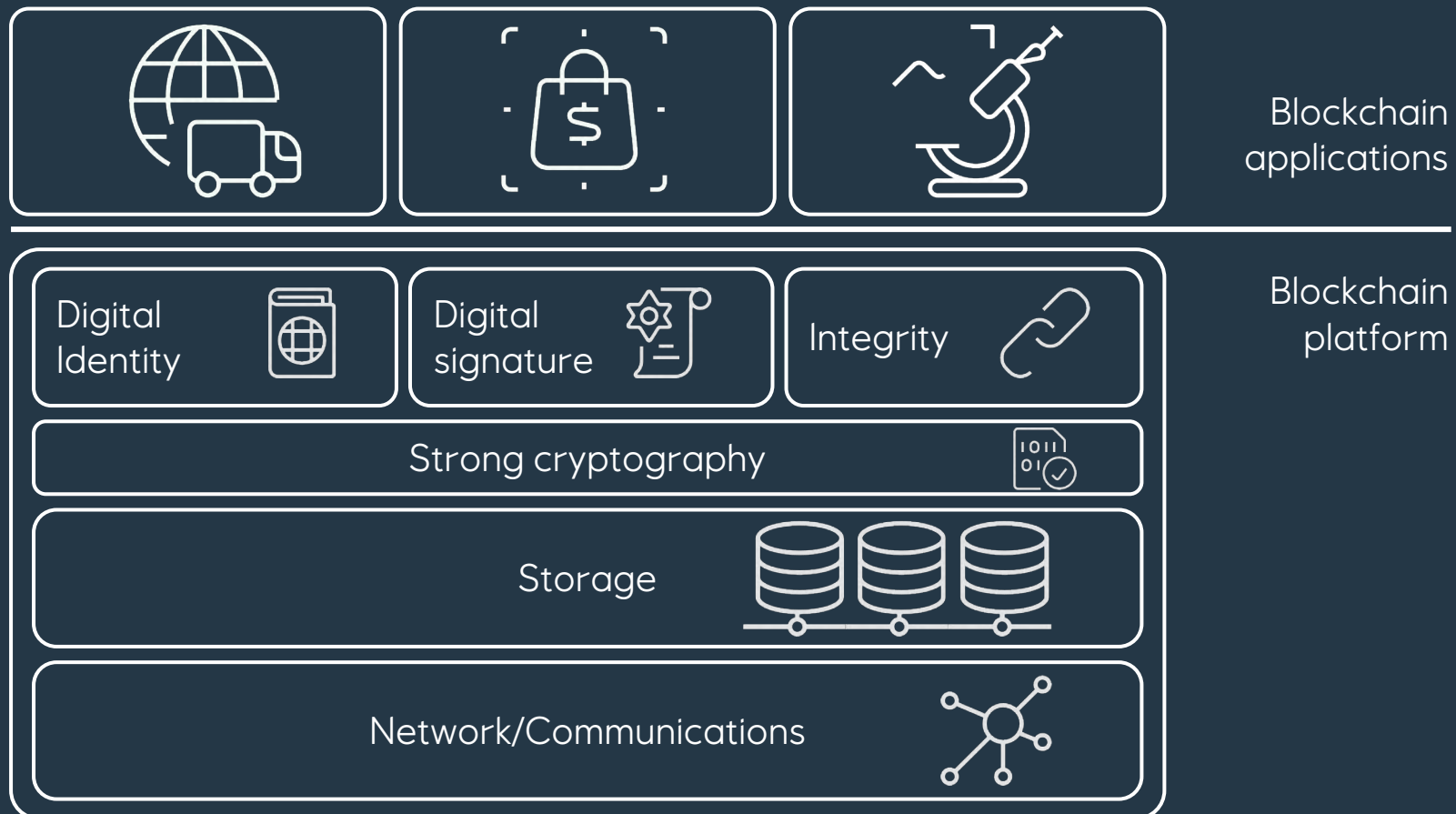


# Blockchain



# Creating distributed trust





Blockchain applications

Blockchain platform



# Analytics



# Replacing the “magic” gut feeling



Volume



Velocity



Veracity



Variety

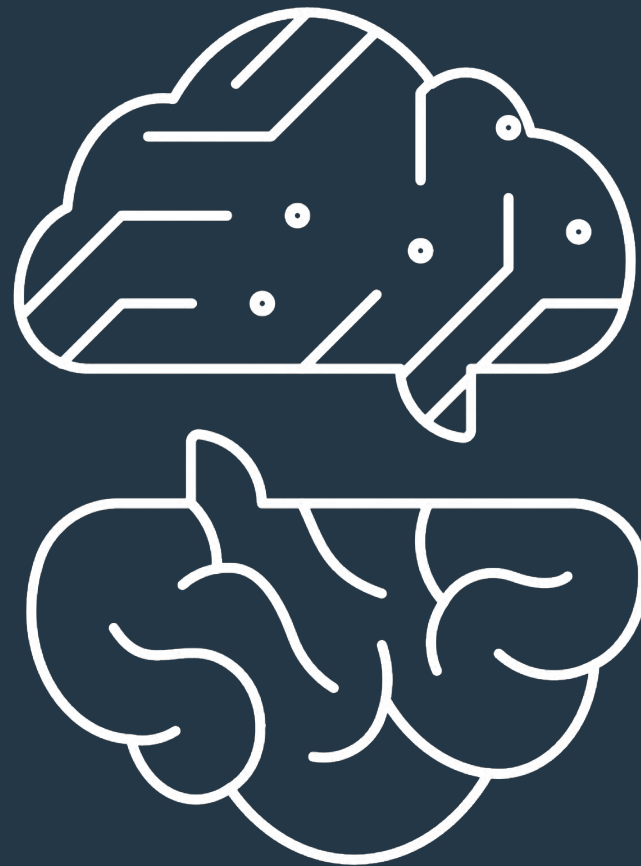


## An Eye in the Sky for Wind Turbines

[Microsoft Azure] [Power BI] [Python] [Docker]

As you're reading this, satellites are circling the planet and capturing images of the surface. It's these very images that we're now accessing, downloading and processing to gain new insight - all so we can know which way our turbines are facing.

<https://www.loop.equinor.com/en/stories/satellite-images-turbines.html>



# Artificial Intelligence



Democratize knowledge



Bayesian  
Networks



Deep  
Learning



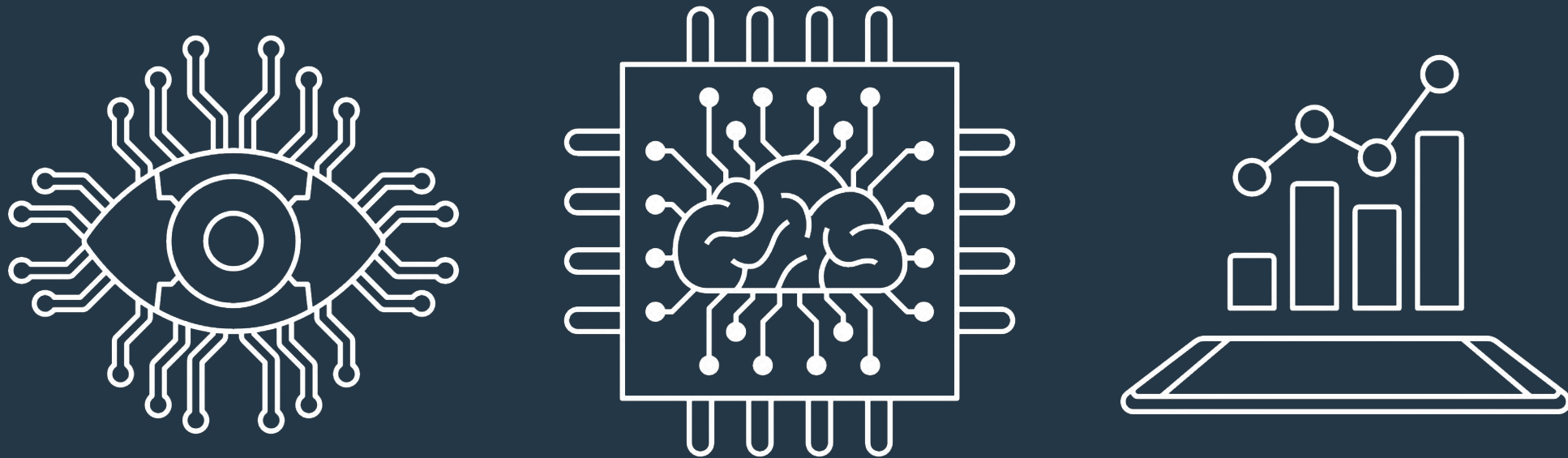
Symbolic



Evolutionary  
Algorithms

# More than just machine learning





Artificial Intelligence is just statistics software



## AI On the High Seas

[\[NodeJS\]](#) [\[ReactNative\]](#) [\[Python\]](#) [\[Docker\]](#) [\[FastText\]](#)

Thanks to AI and excellent teams, our operational planners can now access a wealth of unused information. The result? Even better and safer operations offshore.

<https://www.loop.equinor.com/en/stories/nlp-opt.html>



# Virtual Reality



# New Ways of Seeing



## From cave to headset

[C++] [OpenVR] [SteamVR] [OpenGL2] [OpenGL4]

All you need to step inside an underground reservoir is a virtual reality headset. Here's how software developers enabled us to visualize data like never before.

<https://www.loop.equinor.com/en/stories/shivr.html>



# Cloud Computing

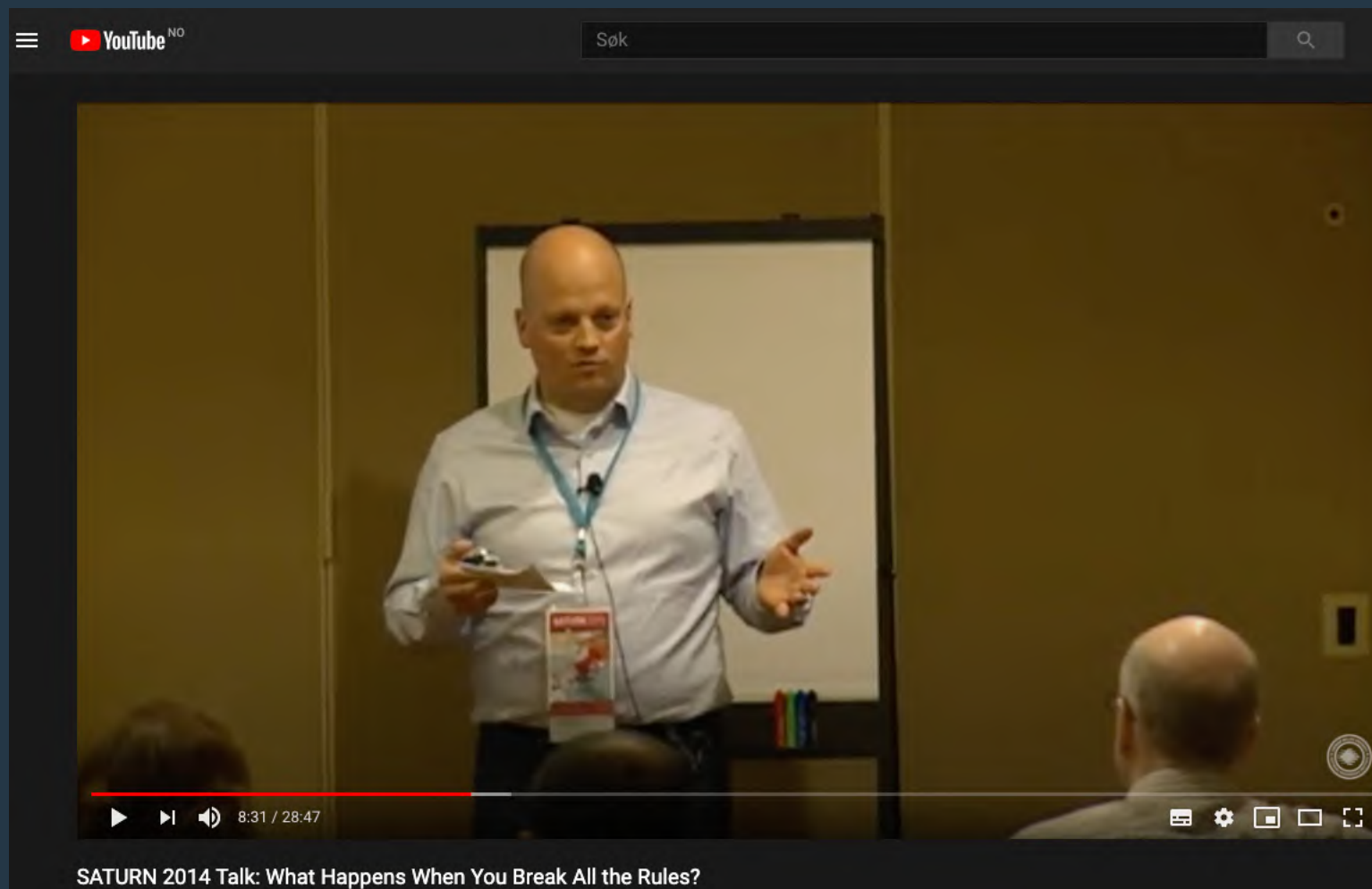


# Lower barrier to entry

The cloud is just someone else's computer



# Our cloud journey started a long time ago



[https://youtu.be/\\_Wa8Ekx3-aA](https://youtu.be/_Wa8Ekx3-aA)

# Distributed Solar, Hydrogen, Batteries, and Carbon Capture and Storage



The modern world is dependent on fossil fuels

# From technologies To capabilities



People



Technology



Processes



Governance

Social Networks



The total knowledge of our employees and their friends

Business Operations



Integration into operation model

Knowledge Sharing and Analytic Models



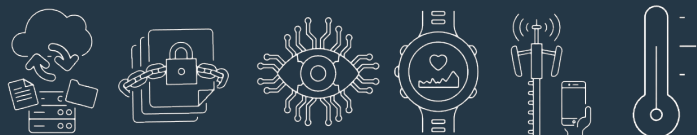
Translation to knowledge

Information and Collaboration



Viewing combined data

Intelligent Infrastructure



Sensors and Networks

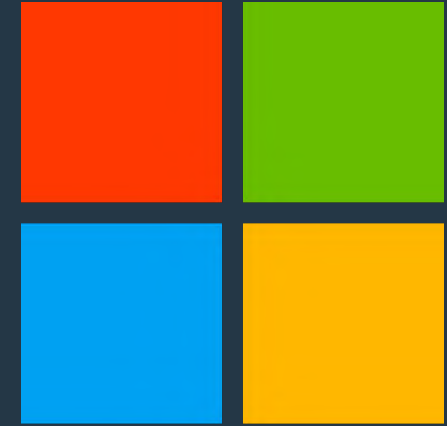
Drive Needs

Open Opportunities

# Why Disruptive?



JOHN DEERE



Microsoft

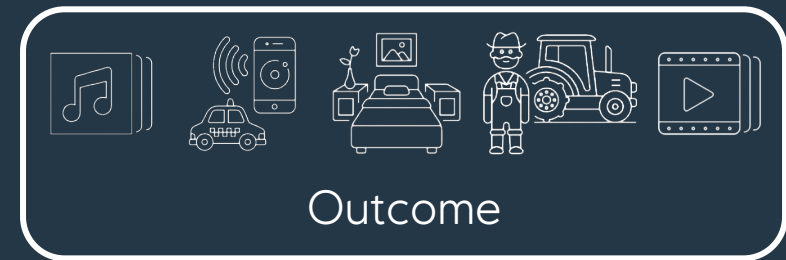
What do all of these have in common?



# From items to outcomes

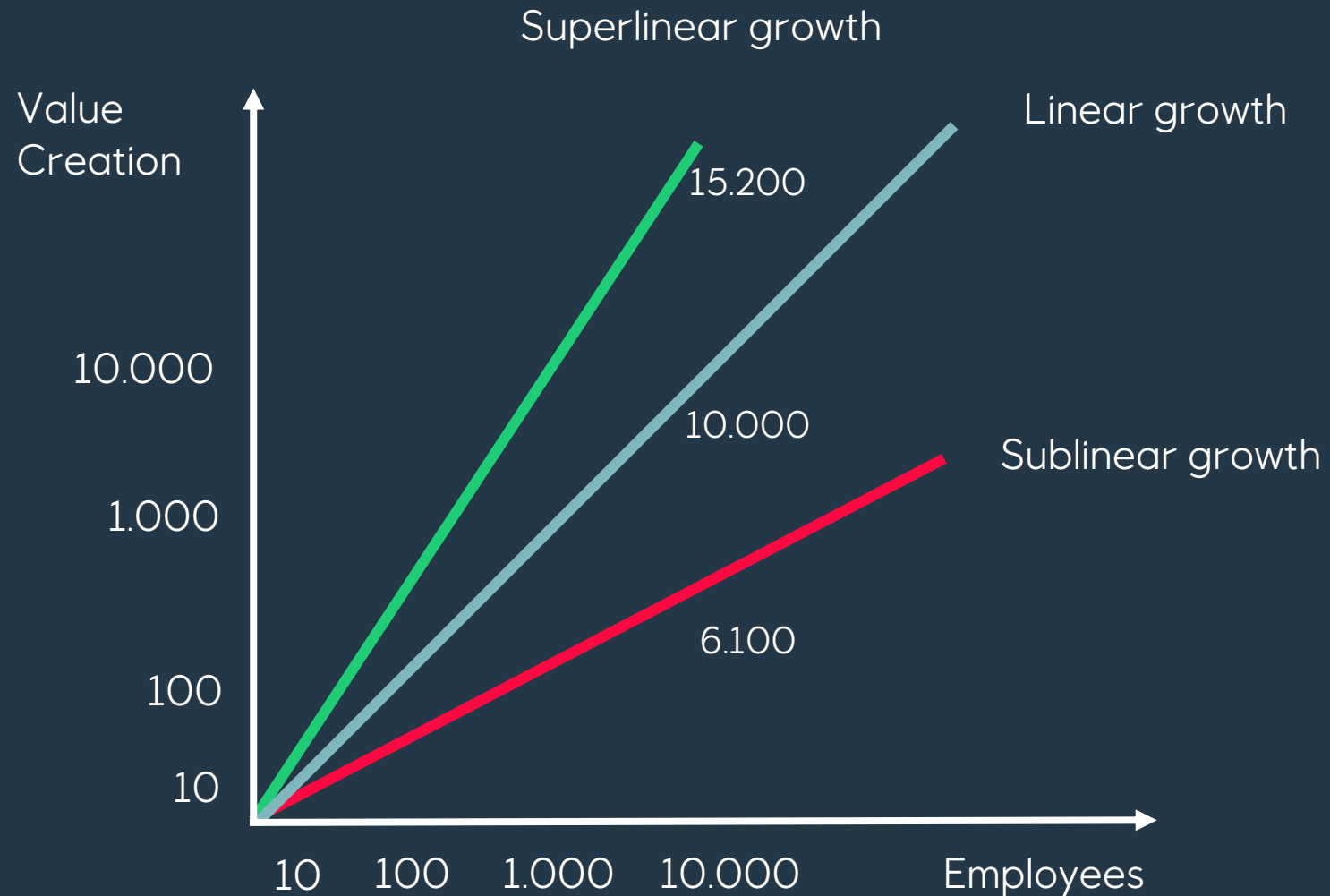


## Traditional Manufacturing



○ Providers    ○ Consumers    ○ Supporting

# From efficiency to effectiveness



# Speed Matters Most



# Production

# Consumption



TSO/DSO = Transmission / Distribution System Operator



Social Networks 

Business Operations 

Knowledge Sharing and Analytic Models 

Information and Collaboration 

Intelligent Infrastructure 

Pay with information

Energy on demand

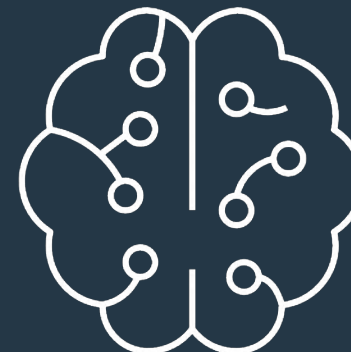
Demand/Response balancing

Energy infrastructure





# What happens when energy becomes "free"?





# 12 Disruptive Technologies Shaping the Future of Equinor

Harald Wesenberg, Equinor Software Innovation

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