



KONGSBERG

kognif ai

MICHAEL LINK

VP Machine Learning & Advanced
Analytics

**DIGITAL TWINS
AND AI**

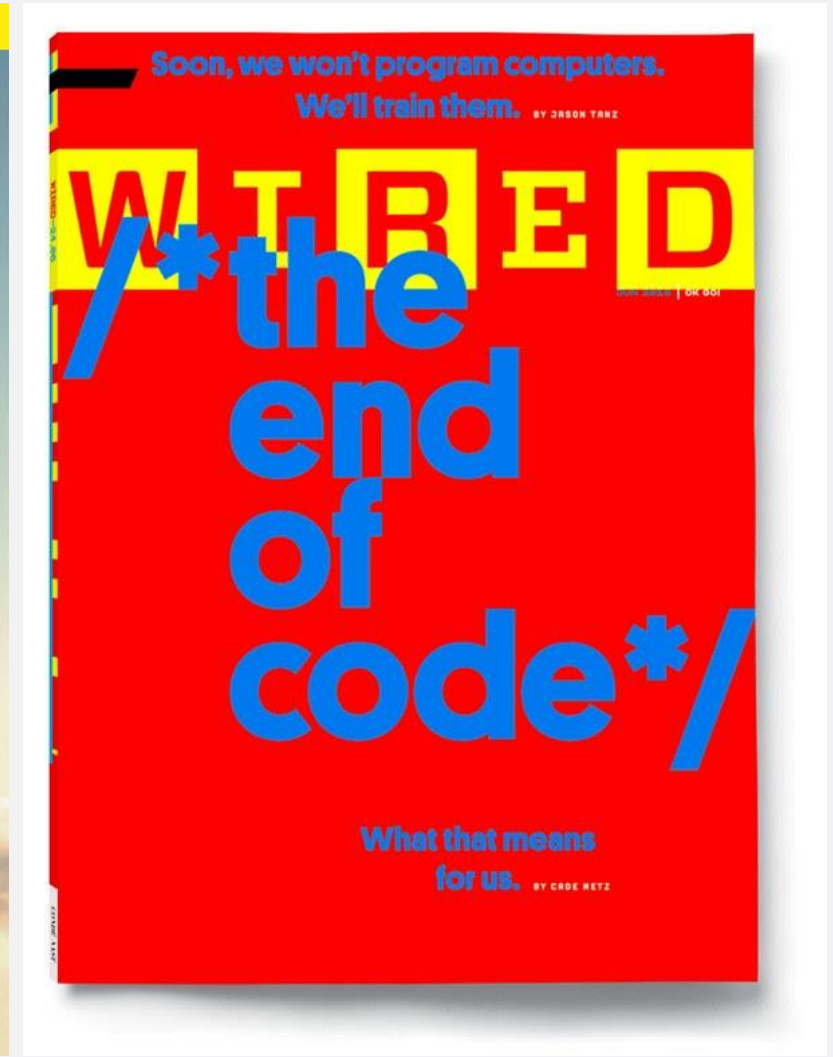
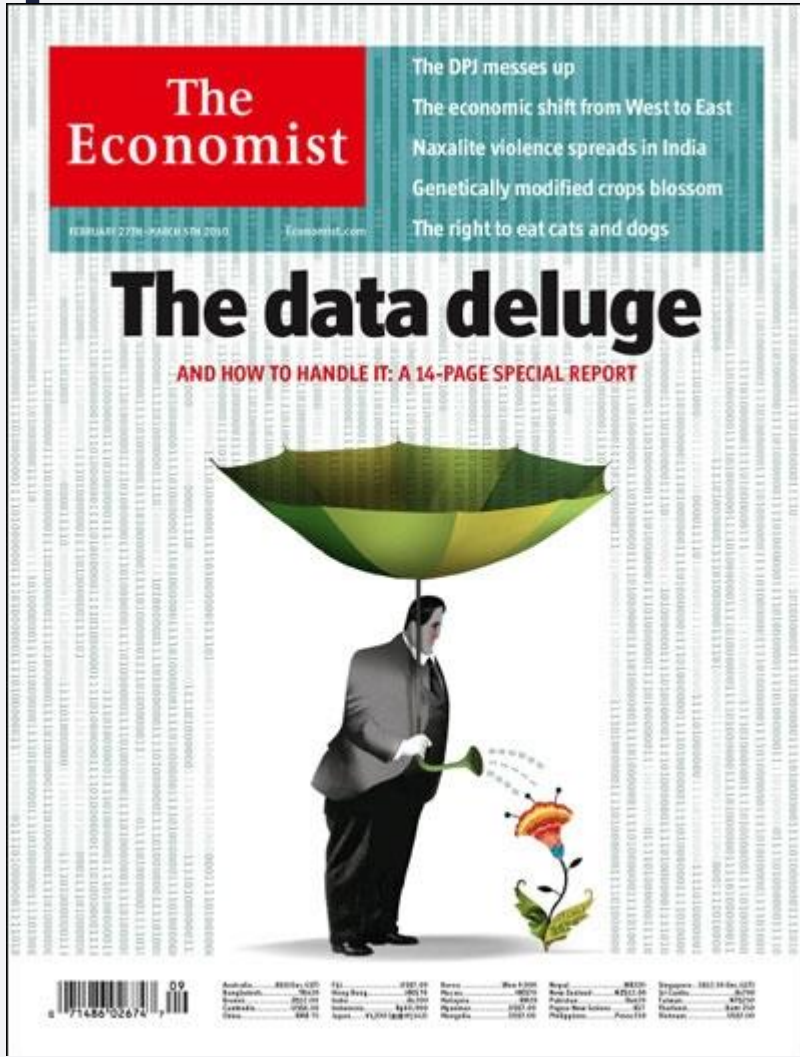
kognif ai

200+ years of technology innovation

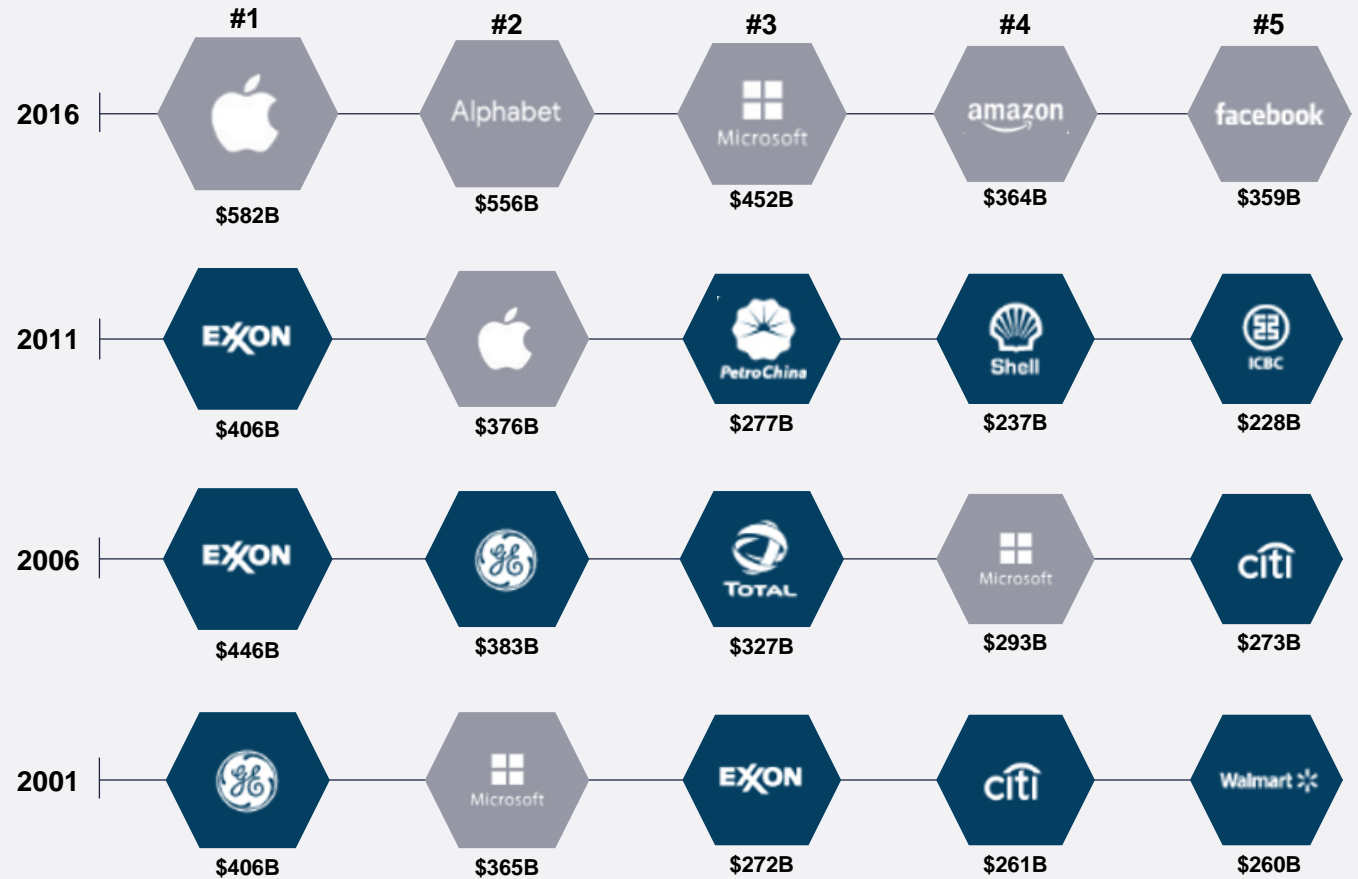


From deep sea to outer space

World where you live

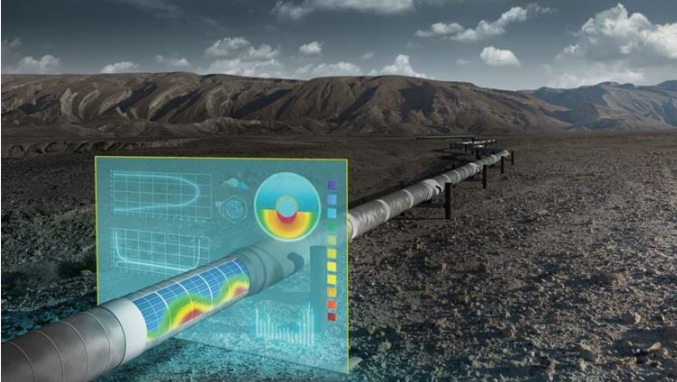


THE LARGEST COMPANIES IN THE WORLD BY MARKET CAP

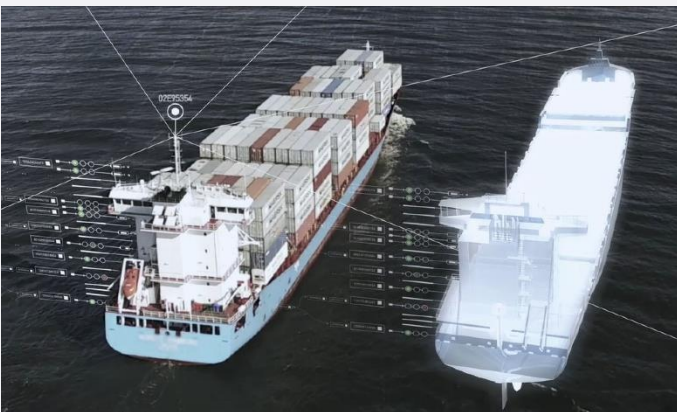


KONGSBERG DIGITAL focus areas

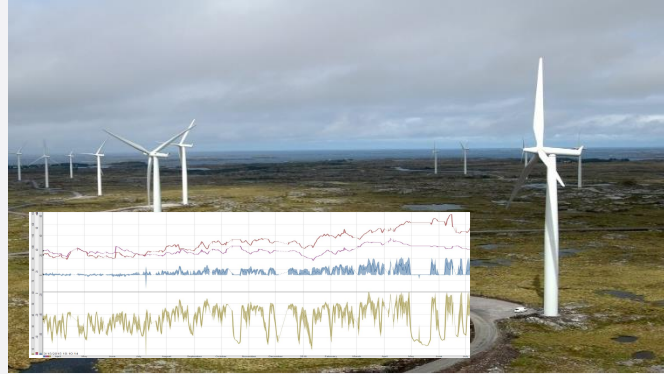
SIMULATION



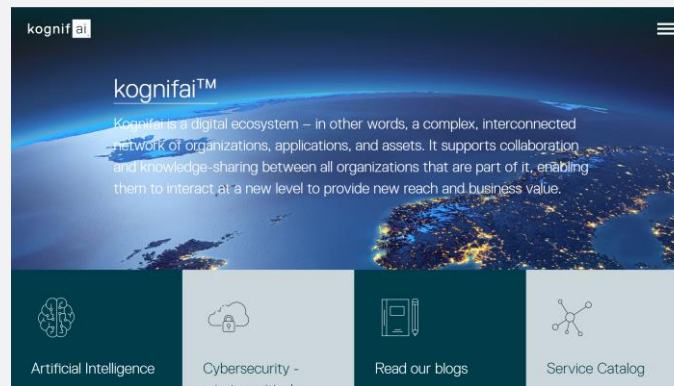
DIGITAL TWINS



IoT, DATA & ANALYTICS



PLATFORM



Energy

- Oil and Gas
- Renewables
- Utilities

Maritime

- Simulation
- Applications

Digital Platform

- Edge & IoT
- Applications
- Analytics
- Cybersecurity

PROCESS SIMULATOR

Product Sheet



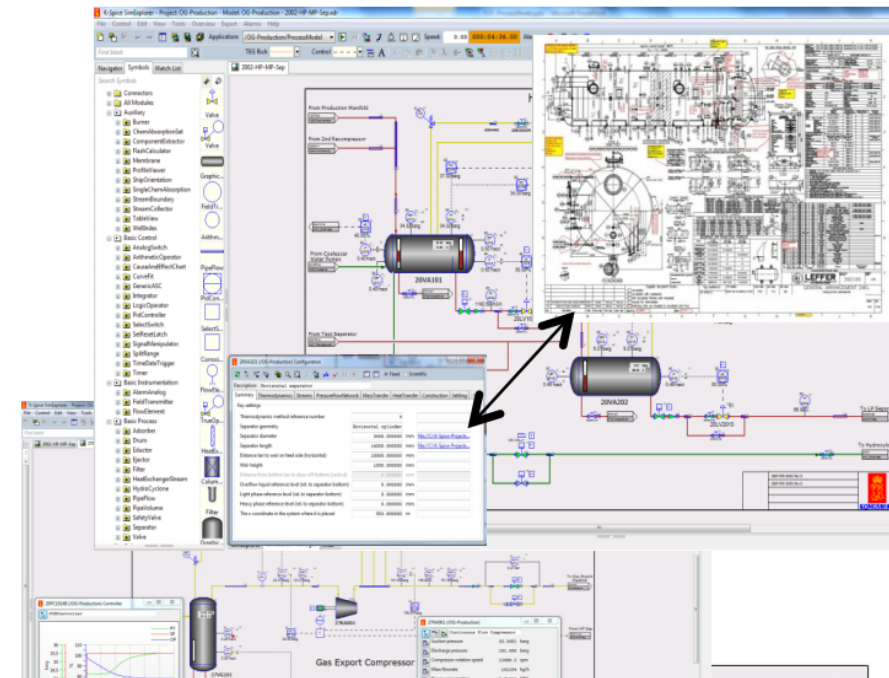
KONGSBERG

K-Spice® Design Design Verification System

Analyze and verify process, control and safety system design for optimization of your facility

K-Spice Design is a multipurpose dynamic simulator that allows the user to carry out process, control and safety analysis for the whole plant in realistic dynamic behavior. It is an excellent tool to enhance understanding of your process, identify bottlenecks and optimize your process facility while creating a safe and informative environment for expanding knowledge in an effective way.

K-Spice Design dynamic simulator consists of a large library of



<https://www.kognifai.com/blog/could-your-business-benefit-from-using-digital-twins-and-digital-threads>

MARITIME SIMULATOR



KONGSBERG



REMOTE OPERATIONS



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AI – SO MUCH EXCITEMENT! WHY NOW?

01 BIG DATA

Connected devices, systems and user-generated content have provided enormous datasets.

02 BIG SYSTEMS

Cloud and Hyperscale computing are horizontal, commoditized enabling technologies available to anyone.

03 ACCESSIBILITY TO STATE OF ART

Decades of research, combined with open collaboration and open-source software reduce barriers of entry.



ARTIFICIAL INTELLIGENCE

The next digital frontier?

The current AI wave is poised to finally break through

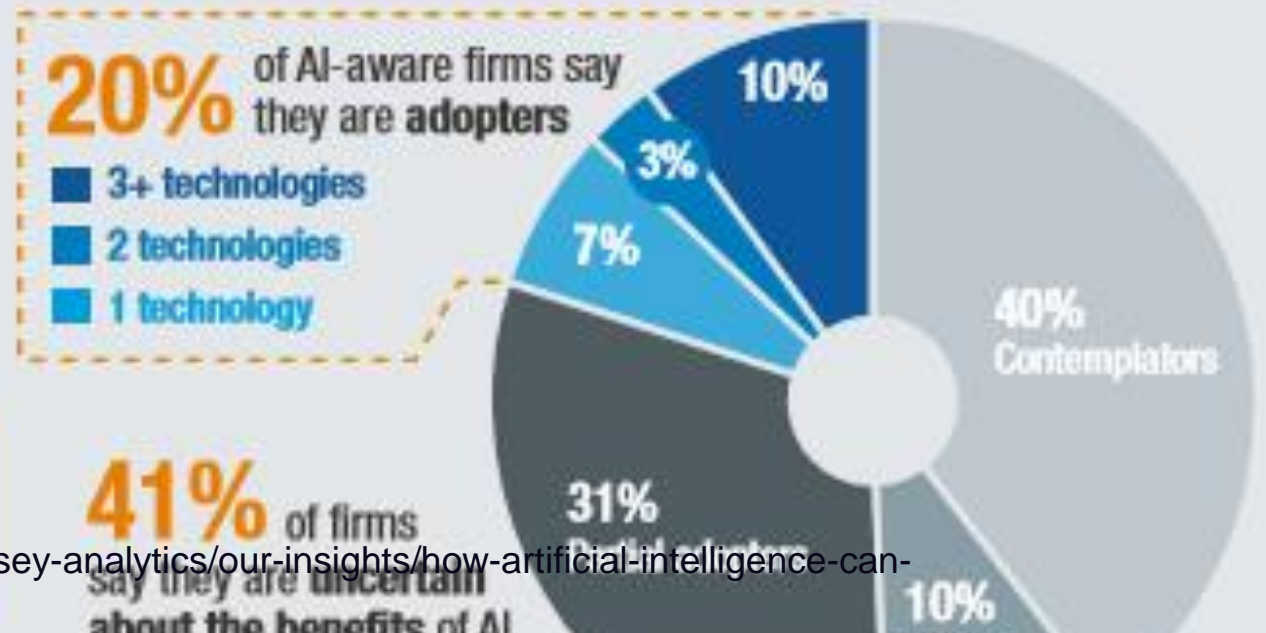
Investment in AI is growing at a high rate, but adoption in 2017 remains low

In 2016, companies invested
\$26B to \$39B
in artificial intelligence

TECH GIANTS
\$20B to \$30B

STARTUPS
\$6B to \$9B

<http://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/how-artificial-intelligence-can-deliver-real-value-to-companies>



Advanced analytics



virtual sensors



structural models



machine learning tools

Collaborating competence groups

3 pillars required for applied ML/AA



Domain expertise

Kongsberg has deep knowledge across many industries globally. Existing physical models and simulations provide Digital Twins of real-life assets.



Data science

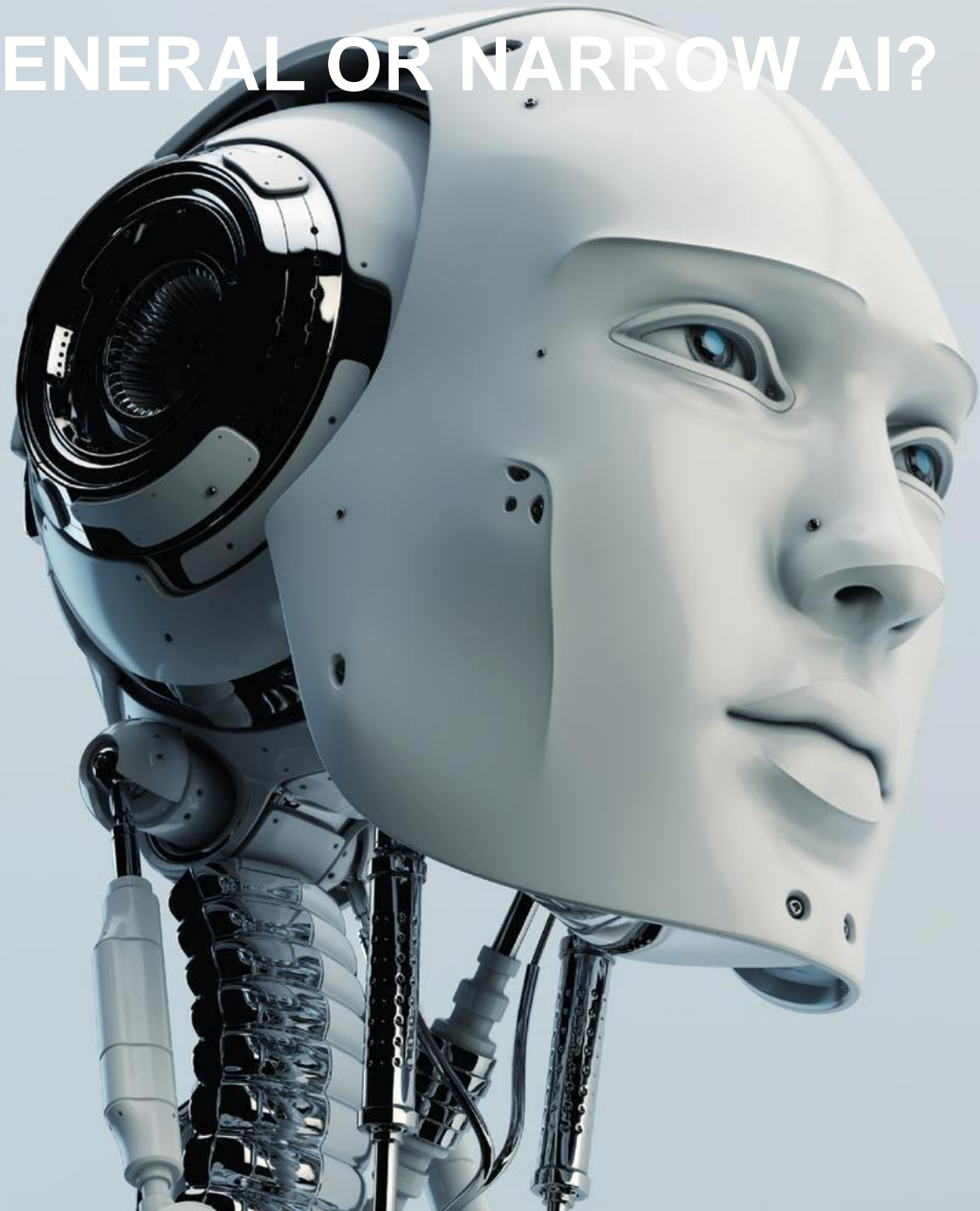
Kongsberg's Data scientists use advanced data driven approaches to find patterns in data. Machine Learning algorithms complement physical models, enabling predictive and prescriptive analytics leading to autonomy.



Data engineering

The Kognifai platform and engineering team enables data to be collected, transformed and analyzed at scale. Actions can be taken in real-time or analyses performed on historic data.

GENERAL OR NARROW AI?



Planning

Learning

Language

Social

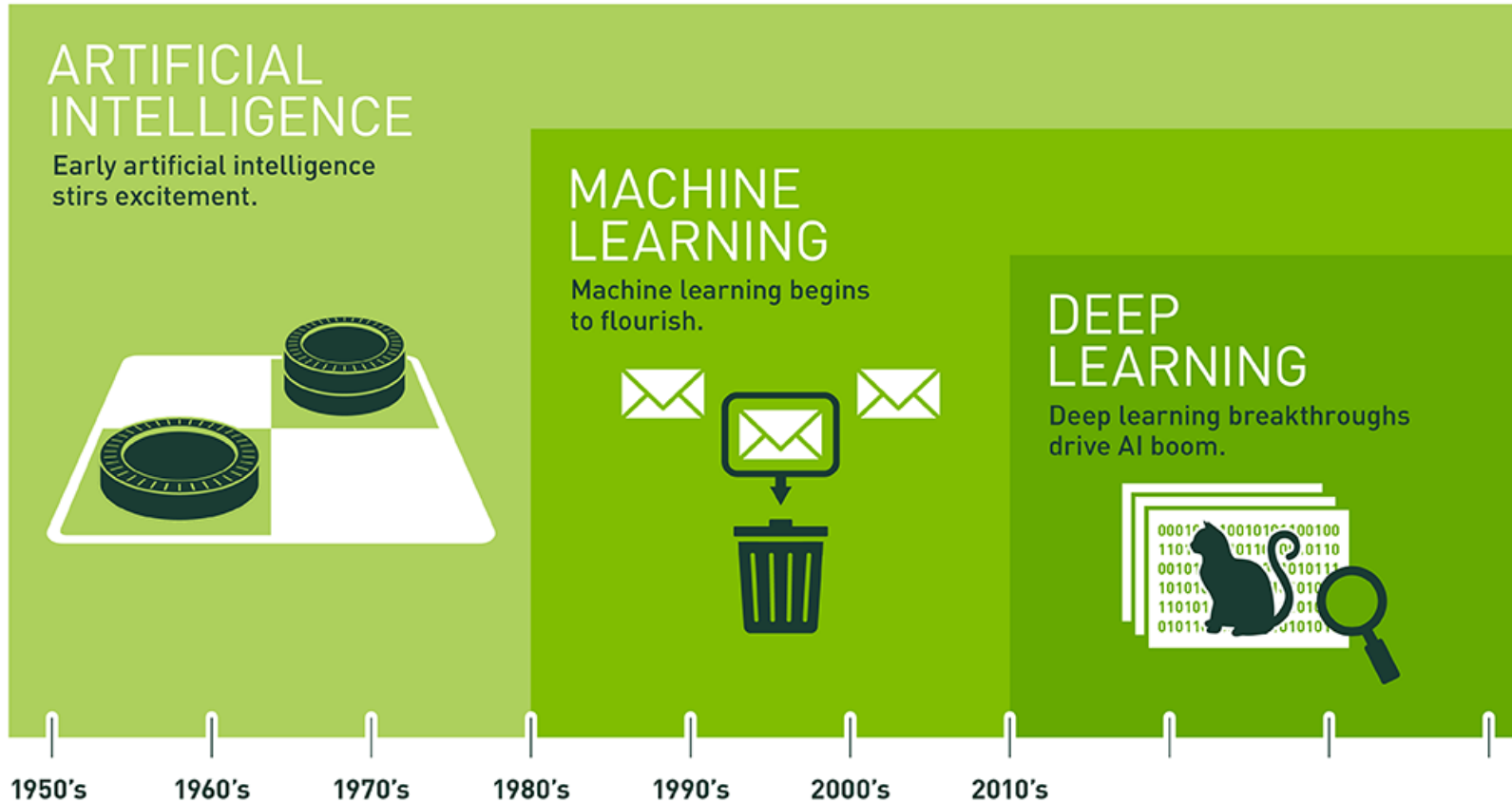
Perception

Navigation

Reasoning

Creativity

DEEP LEARNING



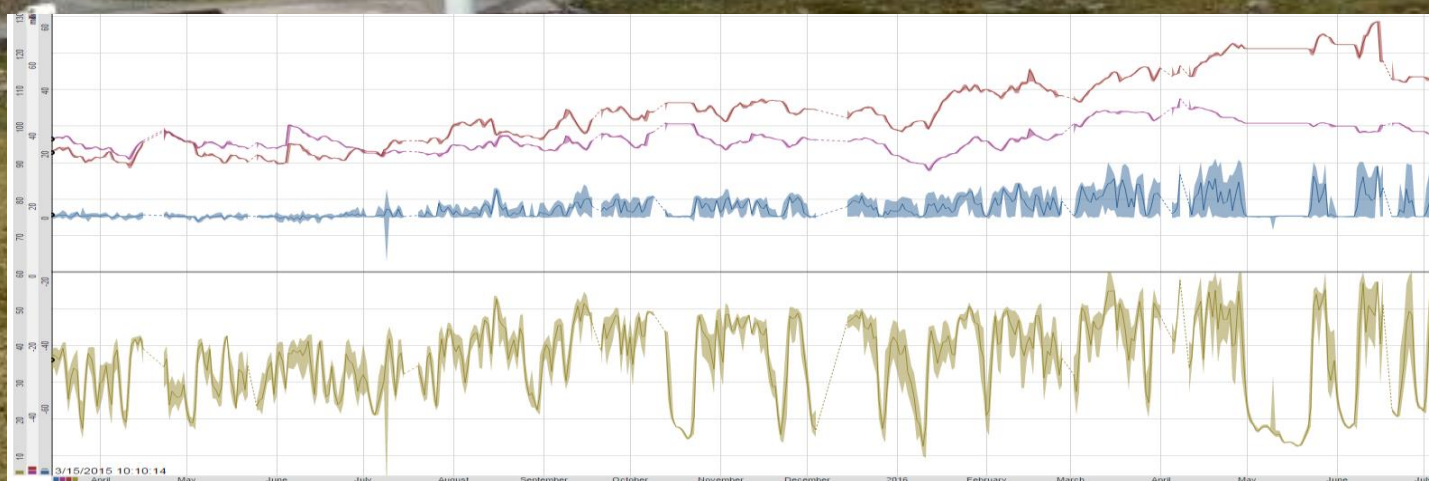
Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

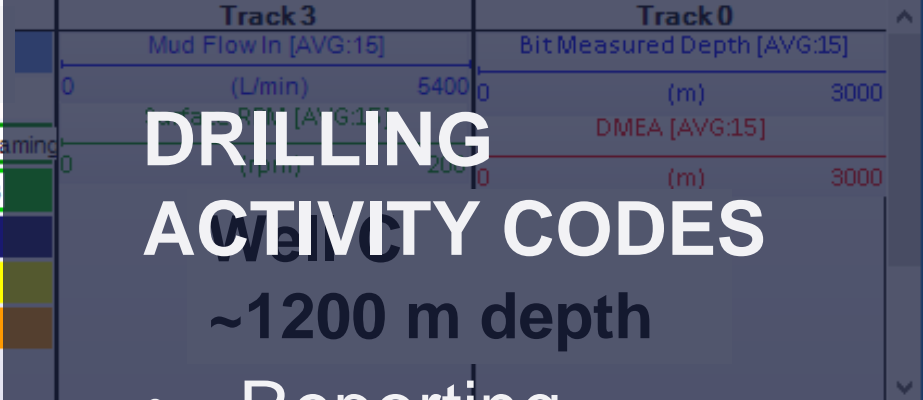
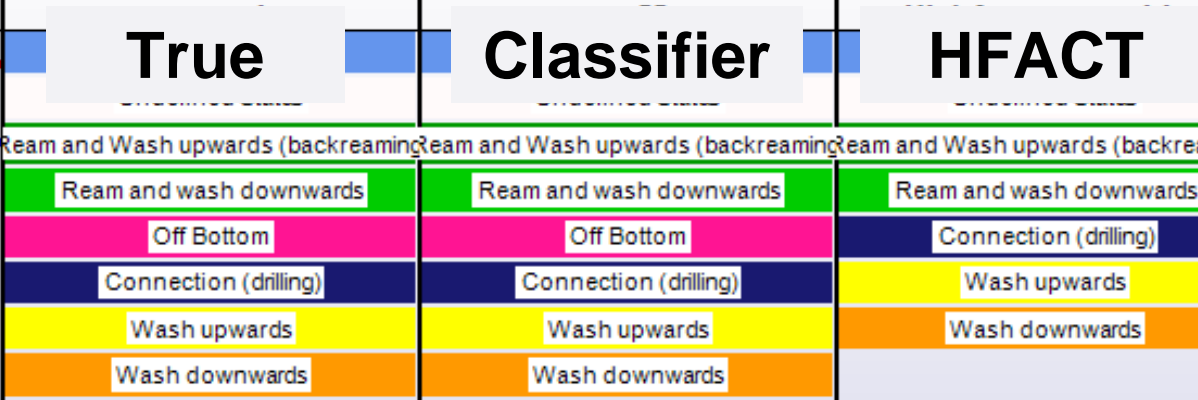
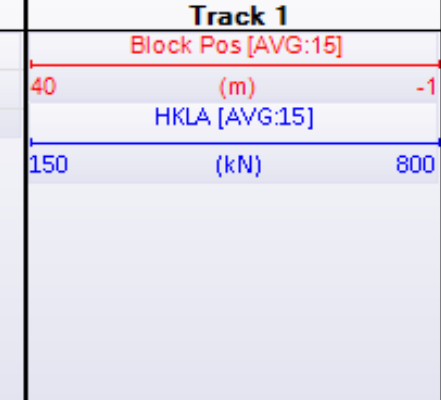
KONGSBERG EMPOWER

- Vibrations
- Temperatures
- Production

OPPORTUNITY

- Detect problems
- Plan maintenance
- Cost savings

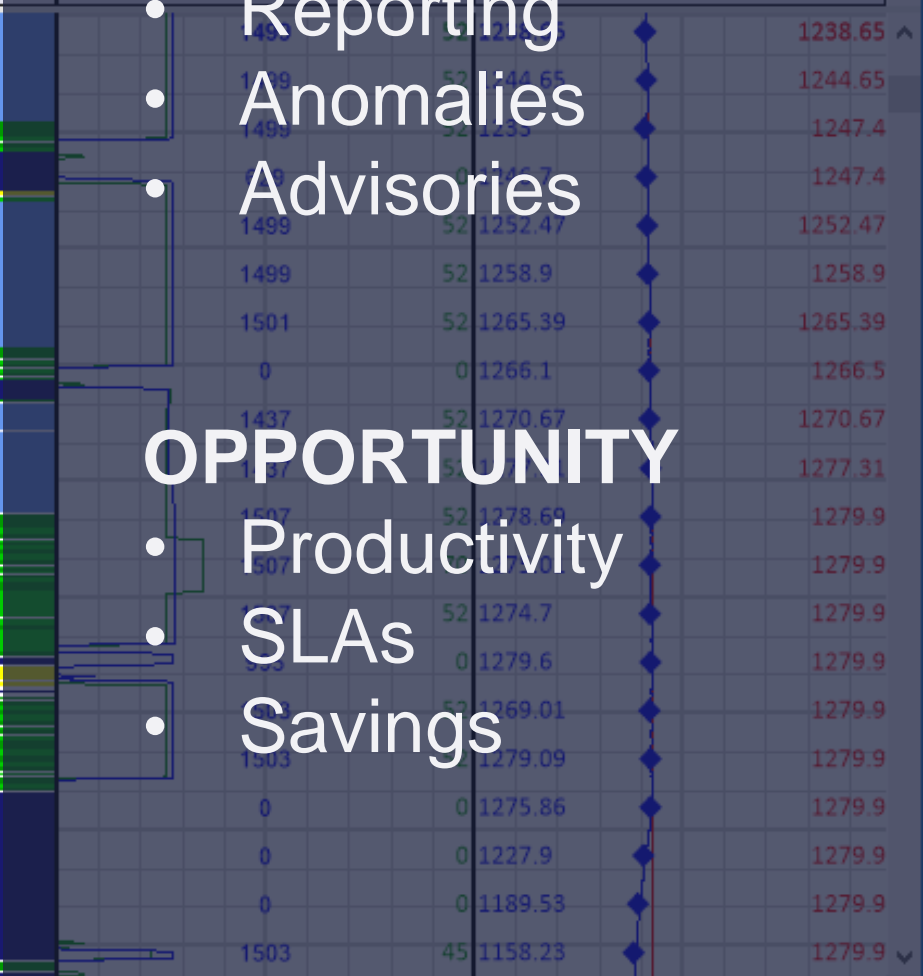
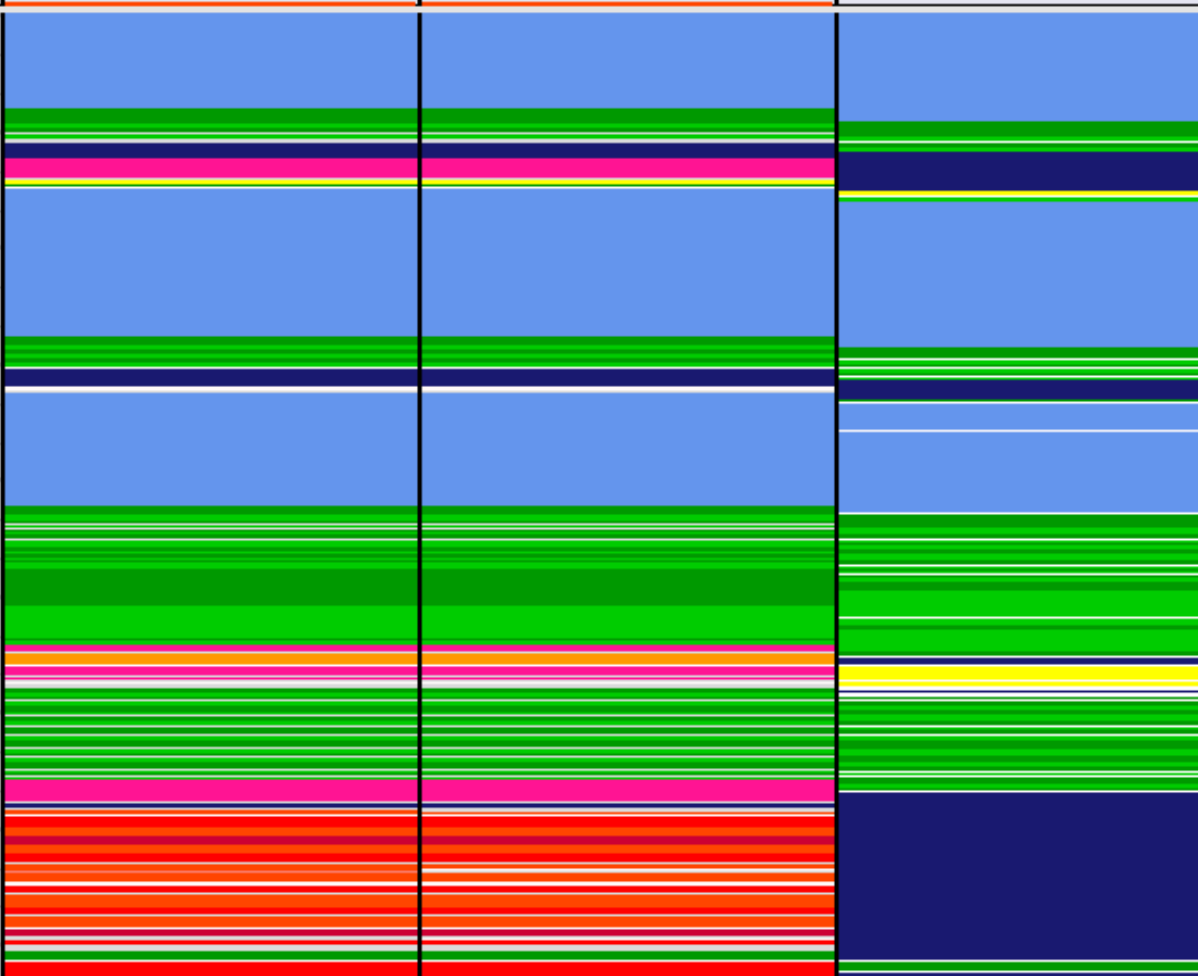
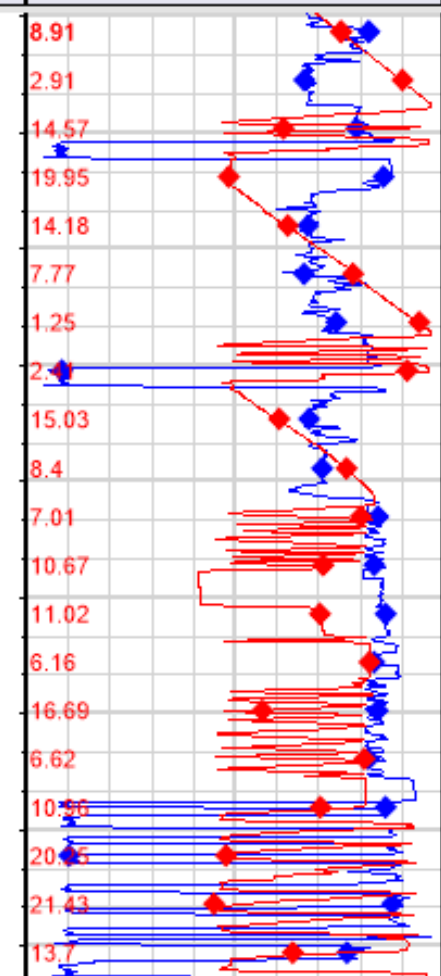




DRILLING ACTIVITY CODES

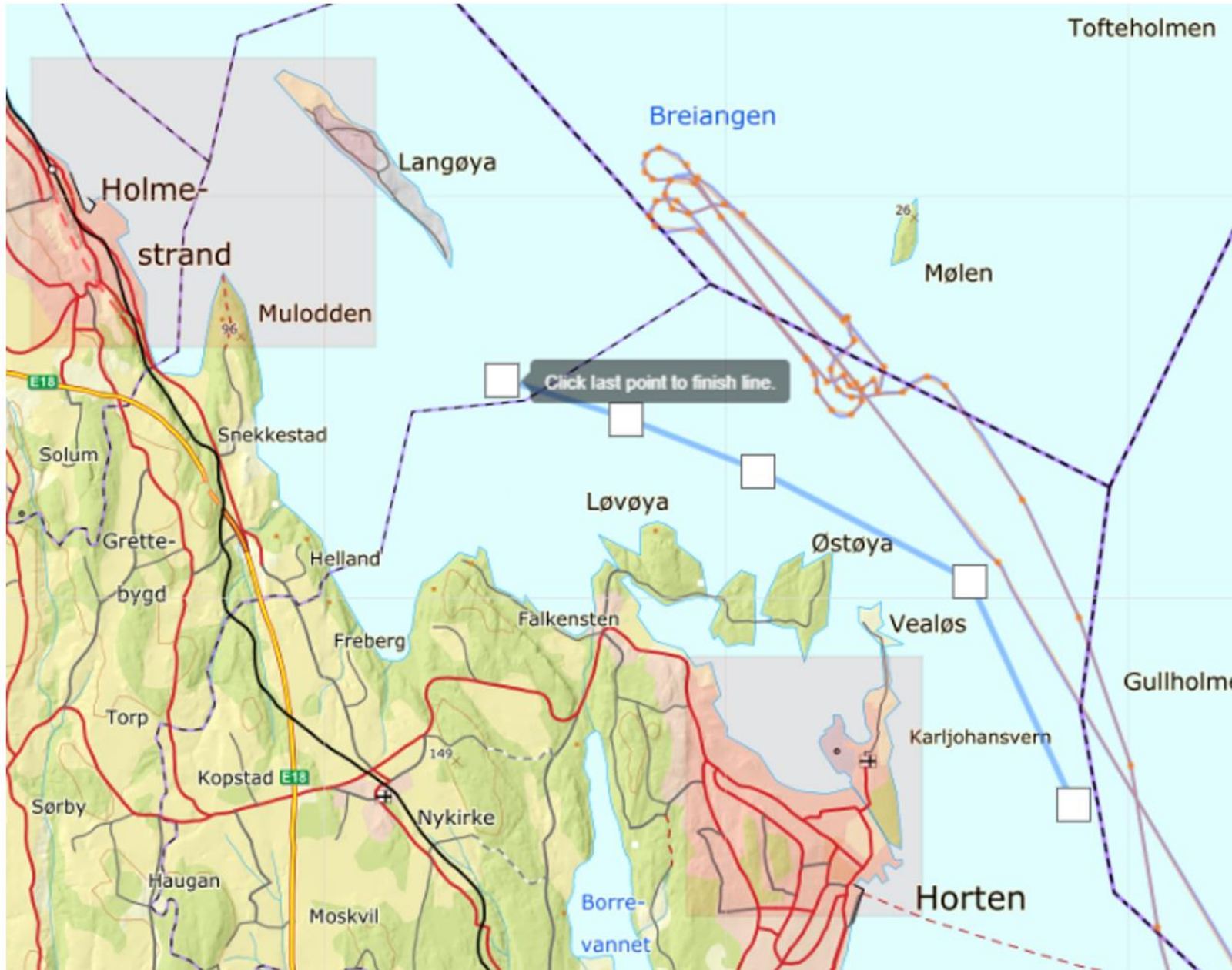
~1200 m depth

- Reporting
- Anomalies
- Advisories



OPPORTUNITY

- Productivity
- SLAs
- Savings



MARITIME COGNITIVE SERVICES

- Prediction

OPPORTUNITY

- Safety
- Autonomy

Kolnesstrand
0.97

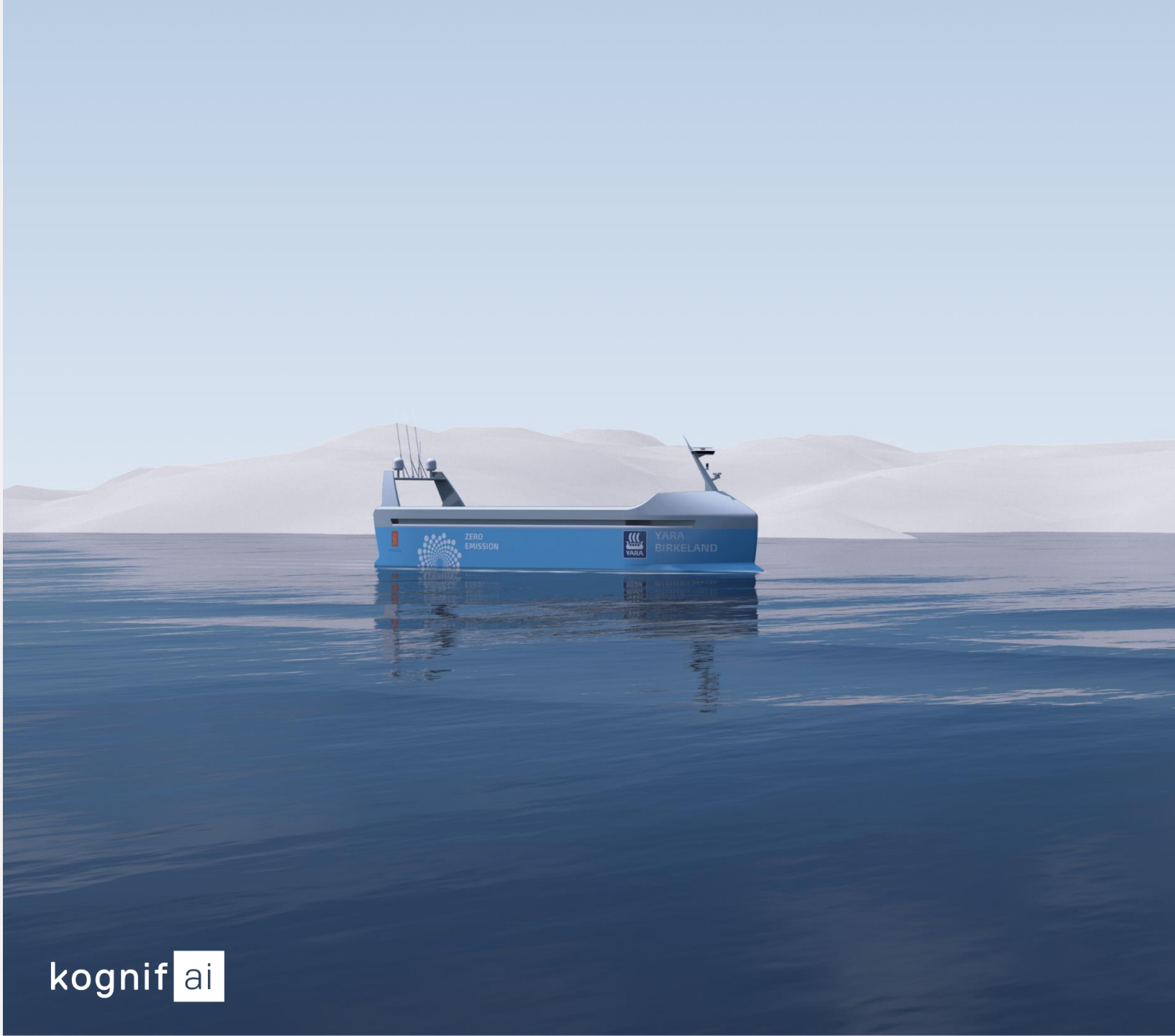
Svelvik
0.03

Horten
0.01

Moss
0.00

Drøbak
0.00

Slagentangen
0.00



AUTONOMOUS VESSELS

- Perception
- Optimization
- Simulation

OPPORTUNITY

- Reduce costs
- Sustainability
- Safety



brown-disc-4 0.497

disc-2 0.780

top-1 0.991

disc-2 0.995

disc-2 0.426

brown-disc-4 0.709

brown-disc-4 0.760

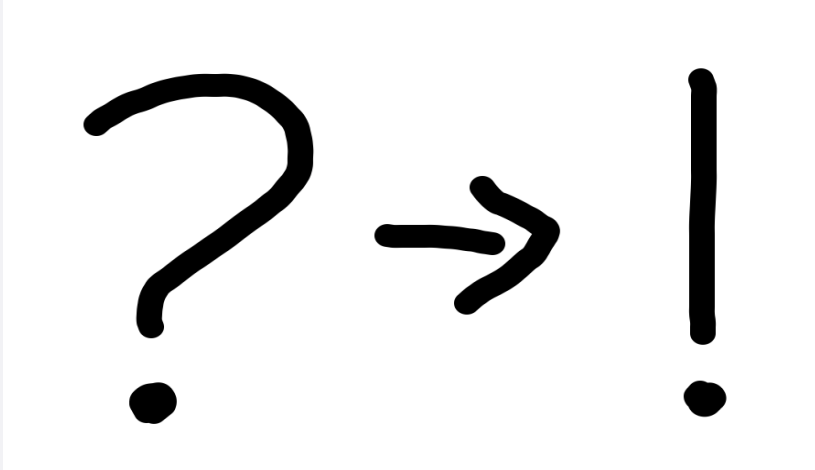
disc-2 0.984

disc-2 0.992

top-1 0.943

disc-2 0.992

Applying AI/ML technology Business problems & opportunities



(BIG) DATA:
The Fuel of all AI and ML

BUSINESS OPPORTUNITY:

- New Product?
- Process optimization?
- Insight

Satya Nadella



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«Our industry does not respect tradition – it only respects innovation»

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