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Agenda

- Jan, AI Lead, Terma
- Maritime Situational Awareness
- What is AI
- RadarID
- AI project organization
- ESM
- Important ingredients in an AI project
- Camera
- Binding it all together

Terma

AERONAUTICS



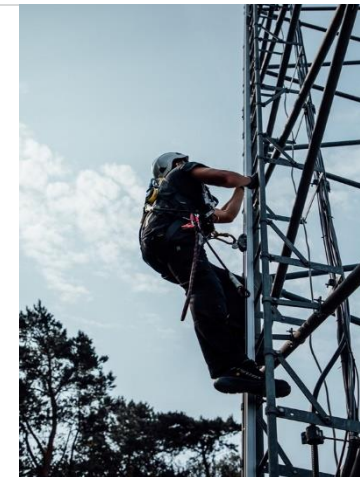
SURVEILLANCE & MISSION SYSTEMS



SPACE



TERMA SERVICES



Jan Neerbek

AI Lead, Terma

- 20+ years of experience in industry
- PhD 2020 (deep learning)
- Terma, Systematic, Alexandra Institute and others

Products and projects

- Large: Microsoft, IBM, Oracle
- Medium: Udbudsvagten, Digital Revisor
- Small/startup: Reachi, DrugStop, My own (IP teleconferencing)
- Alexandra: Danish resources for better AI
- Tech: Deep learning/ml, NLP, speech, image, sensor, big and streaming data
- Roles: data scientist, architect, tech lead, developer, project manager, team lead and others
- Publishes articles and patents.



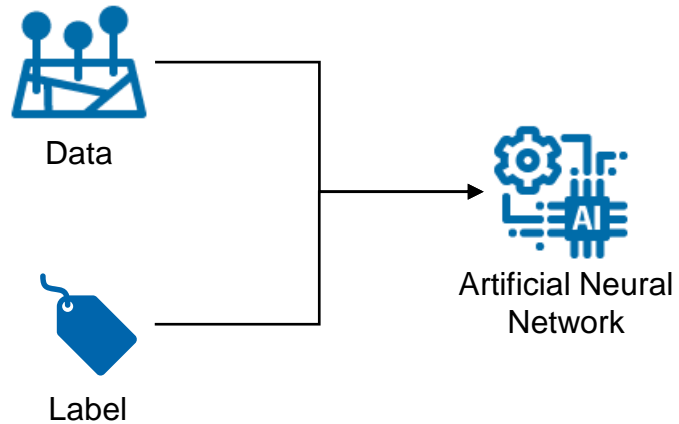
AI POWERED Maritime Situational Awareness



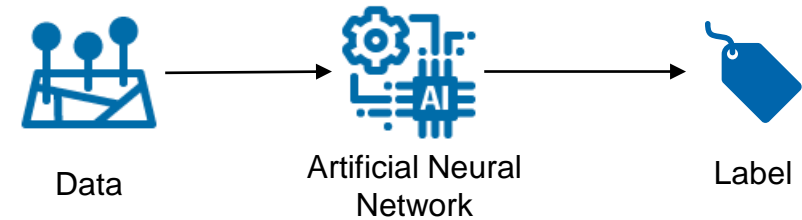
AI explained

Software formed by Data instead of software engineers

Training the AI



Using the AI



Radar as a new sensor



AI identifies ship types from Radar data

Cargo ships & Tankers



1.00 355249000: MSC ATLANTIC Cargo L=237m , W=32m



1.14 355289000: MSC SUEZ Cargo L=237m , W=32m



1.14 355194000: MSC JORDAN Cargo L=237m , W=32m



1.27 219136000: VILNIA MAERSK Cargo L=200m , W=36m



1.28 219115000: VENFA MAERSK Cargo L=200m , W=36m

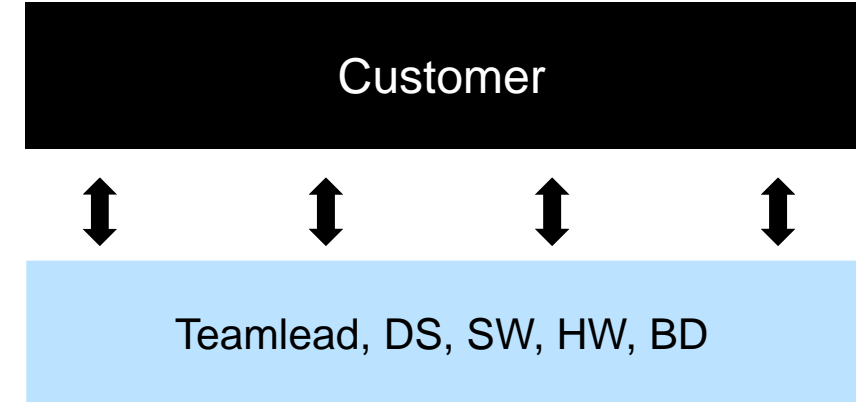
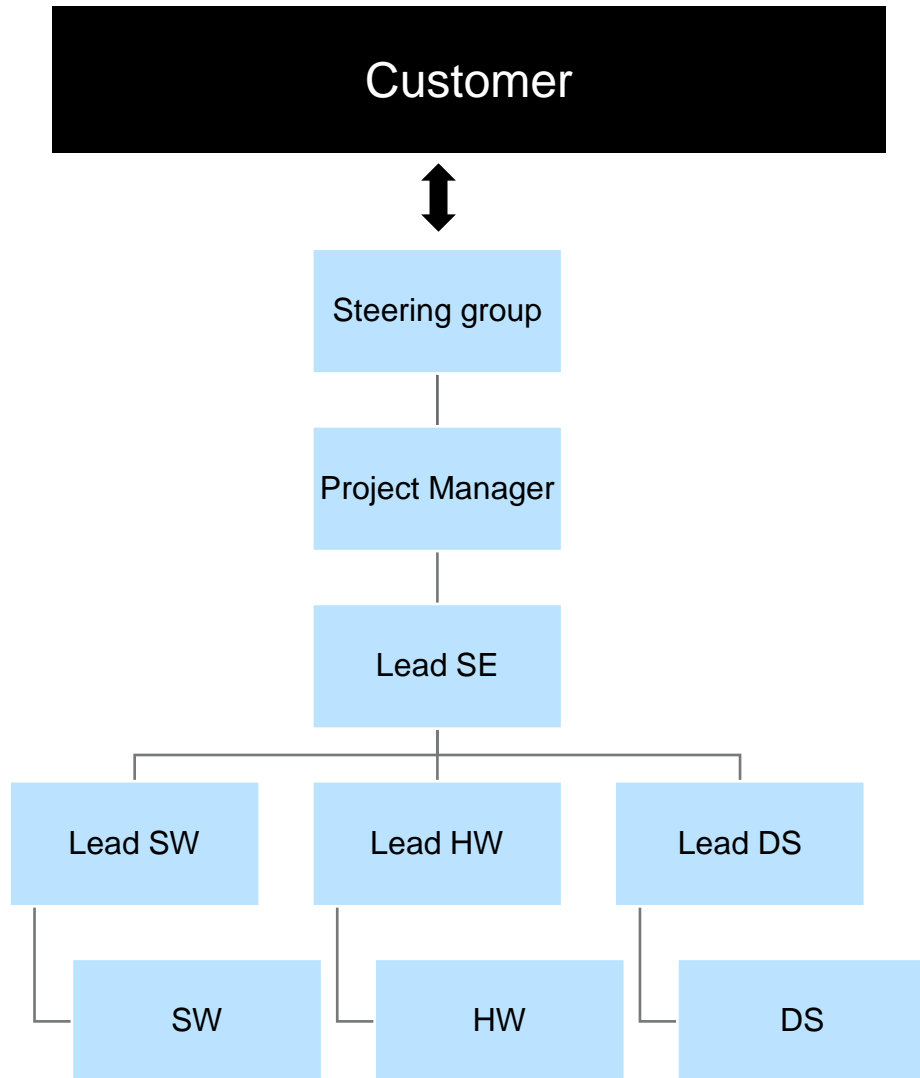


1.27 FBN Raiger
MarineTraffic.com
AIS: MILAN EXPRESS[Cargo] L=216m, W=32m

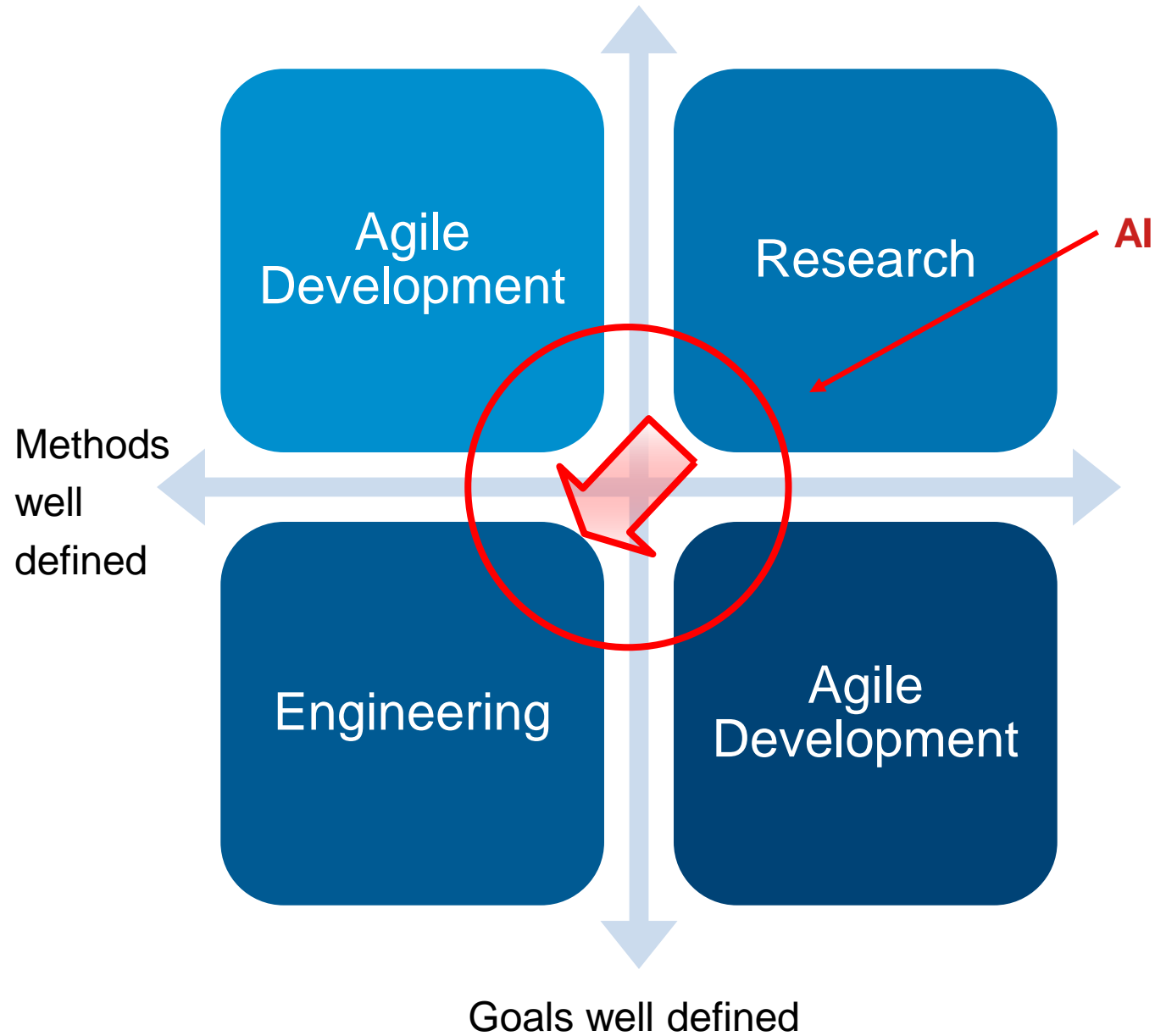
Organization



Old project org vs New Product Development



Goals and Methods



Artificial Intelligence is new, fast moving, and with unknown applications

Classical organization only in a limited way allows for the experimentations and research needed to identify robust business opportunities in AI

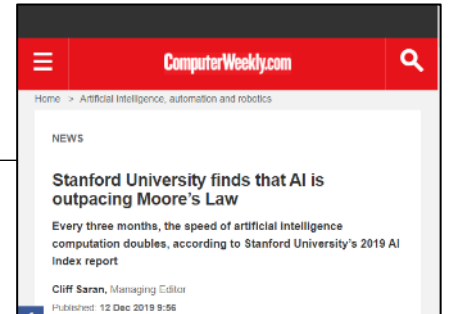
AI is new technology with new requirements

- Data data data
- Pattern recognition vs. intelligence



AI is fast moving

- Not a week without new technology announcements



AI is unknown applications

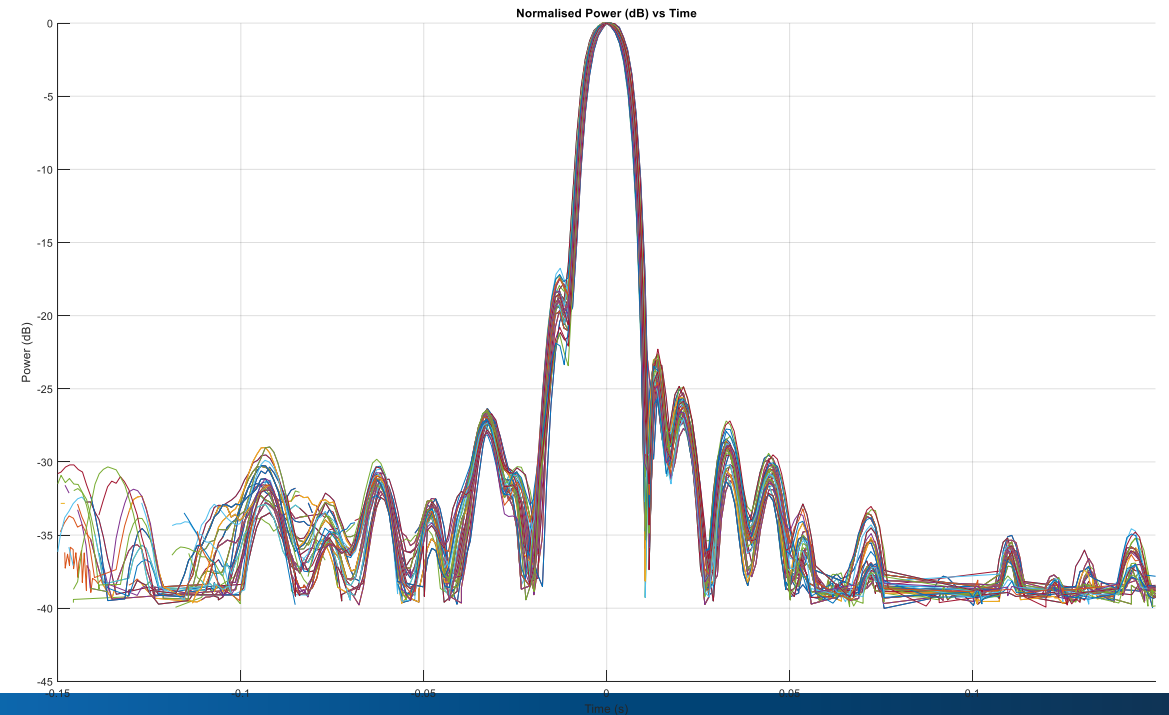
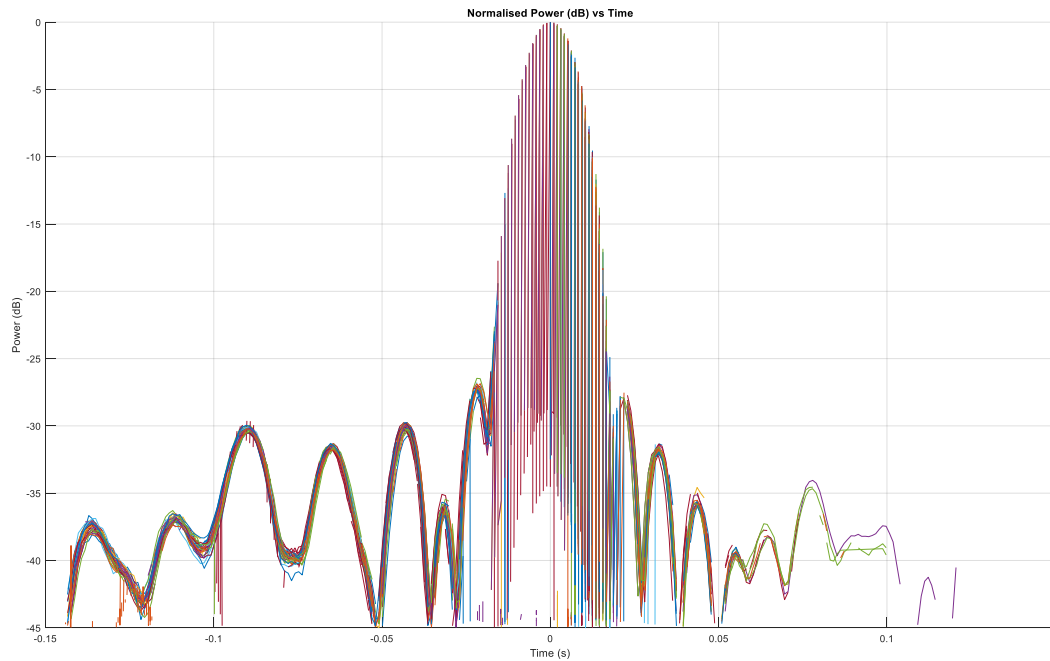
- Our customers do not understand how AI can help them
- Neither we nor our customers can say which AI applications will be successful
- Strongly driven by data volume and quality



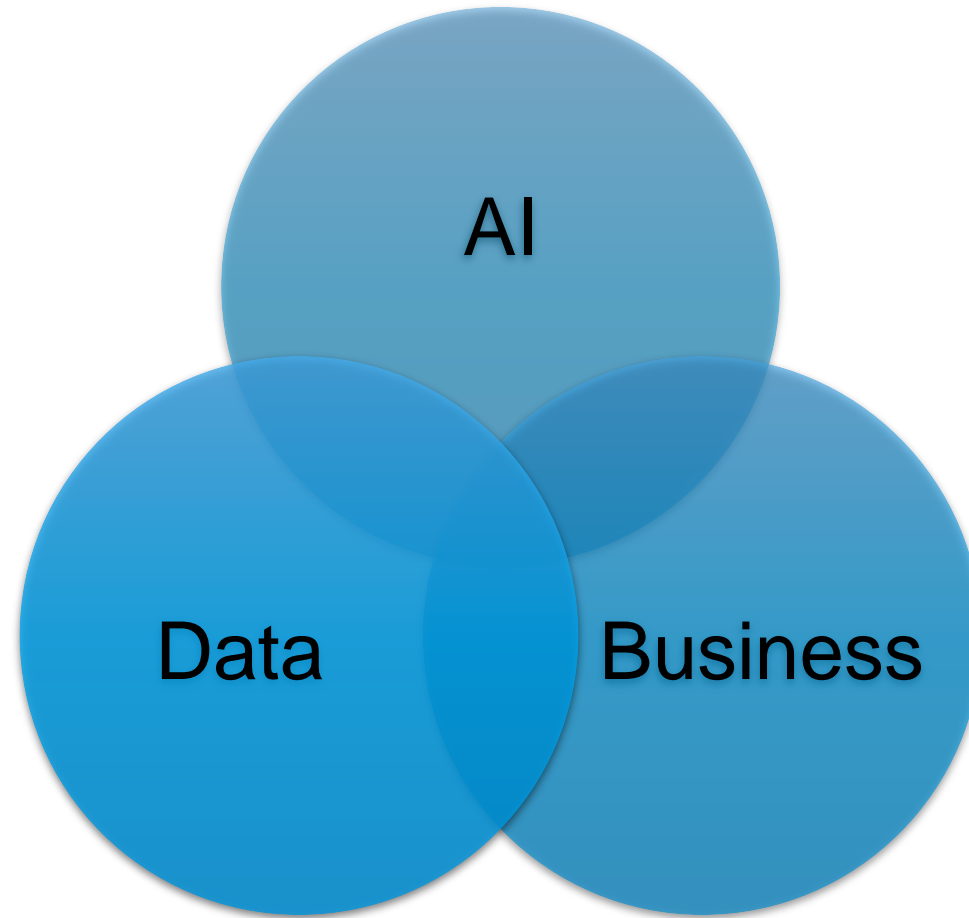
Training AI to recognize unique radar's from each other



Training AI to recognize unique radar's from each other



Working with AI



Electro Optic camera





Aircraft carrier: 0.999



Aircraft carrier: 0.998



Destroyer: 0.998



Destroyer: 0.998



Submarine: 0.981



Submarine: 0.984



Container ship: 0.998



Container ship: 0.995



Bulk carrier: 0.998



Bulk carrier: 0.998



Cruise ship: 0.998



Cruise ship: 0.998



Tugboat: 0.998



Tugboat: 0.994



Tugboat: 0.984
Container ship: 0.974



Submarine: 0.988
Tugboat: 0.982



Electro Optic camera's

- Vessel Type
- Vessel Name/Number
- Size
- Objects

AI POWERED Maritime Situational Awareness



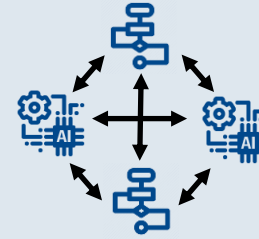
Sensor driven Maritime Situational Awareness



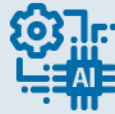
Client service layer



Data fusion layer



AI-lag



Raw sensor data

Surface Radar

E/O sensor

Other sensors

RF-fingerprinting

AI/manual input

Information level high
(Knowledge is unveiled)

Raw data
(Knowledge is hidden)

Conclusion

- Close collaboration with customer/business
 - Best usecase is different from what you think
- Agile project organization
- Tracking progress is a must
- Investment in quality data and pipelines/infrastructure
- Model training is the easy problem
- Start now



THANKS!