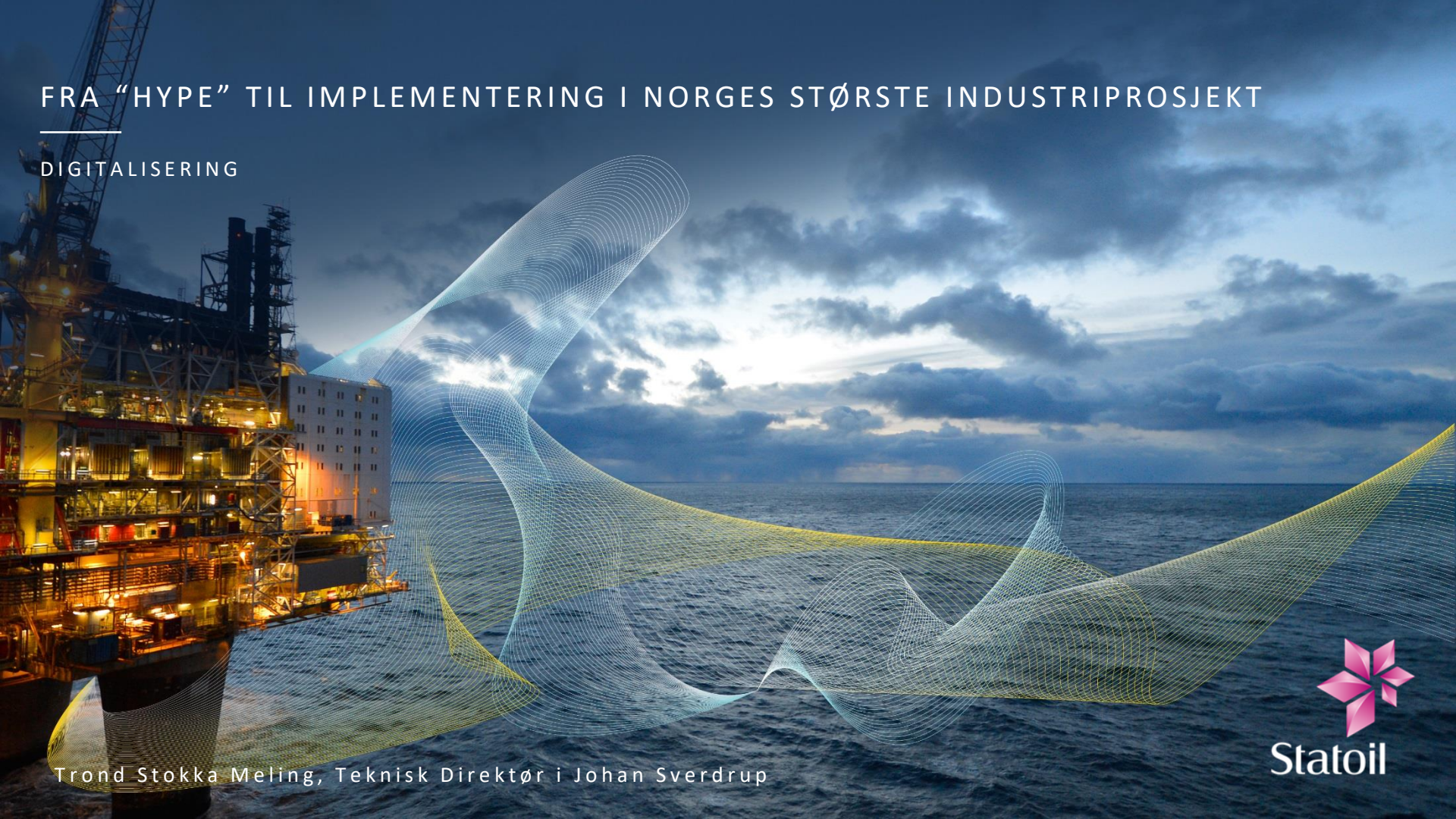
FRA “HYPE” TIL IMPLEMENTERING I NORGES STØRSTE INDUSTRIPROSJEKT

DIGITALISERING



Trond Stokka Meling, Teknisk Direktør i Johan Sverdrup

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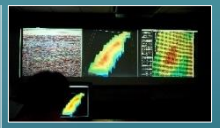


1970's: Mainframe computers to process seismic data

1990-2000:
Tampnet - Subsea fiber optics for offshore installations, enabling big data transmissions

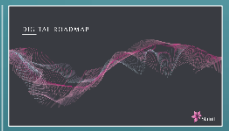
2005:
Real time streaming of drilling data and monitoring in Real Time Center

1998-2003:
Score project – common platforms for subsurface data, new IT-tools like 3D visualization rooms

2015:
Åsgard subsea compression goes live

2015:
Valemon on stream, partly unmanned operations from onshore Central Control Room

2017:
Statoil Data platform goes live with the first data from Grane field



By 2025:
AI, cloud, connectivity, high capacity computing, robotics

1970 1980 1990 2000 2010 2020 2030

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Digital opportunity driven by 3 technological enablers

Process digitalisation	Reduced process lead time and manual human input for non-physical processes
Advanced analytics	Improved understanding of large, complex and diverse data to enable more informed decision making
Robotics and remote control	Improved reliability, reduced cost and increased safety by limiting human intervention in physical intensive activities

Digital technologies are undergoing rapid development which present significant opportunity for Statoil

-96%

Reduction in cost of data storage from 2005 - 2015

x40

Increase in global data volume expected by 2025

~90%

of all data available today have been generated in the last 2 years

42%

Annual growth in IoT sensor market from 2016-2022

20Bn+

devices will be connected online (IoT) by 2020

SOURCE: Market and Markets, McKinsey, D. Evans, Economist

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Johan Sverdrup | The North Sea giant

* 2016-2018

Statoil

Johan Sverdrup | The digital flagship

Digital field development
- Always safe project execution
- SSI
- 20% reduction in engineering hours
- Up to 40% reduction in documentation

Data-driven operations and maintenance
- Best-in-class SSU and asset integrity
- Achieve PE >96%
- Reaching 30% reduction in total OPEX

Digital subsurface
- Make data driven decisions
- Revolutionise collaboration
- 50% reduction of waste in work process
- Reach 70% recovery factor

Digital drilling and well
- Reduced personnel exposure in red zone
- Prevent well control incidents
- 15-20 % Increased well construction efficiency

Production, process & energy optimization

Digital well delivery

Digital thread, Work process digitalization, automated supply chain

Data platform, data quality, data science, competence and software

All numbers are rough estimates to indicate the potential

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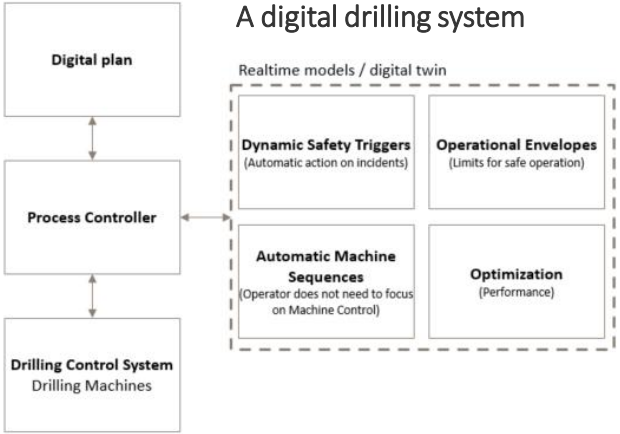
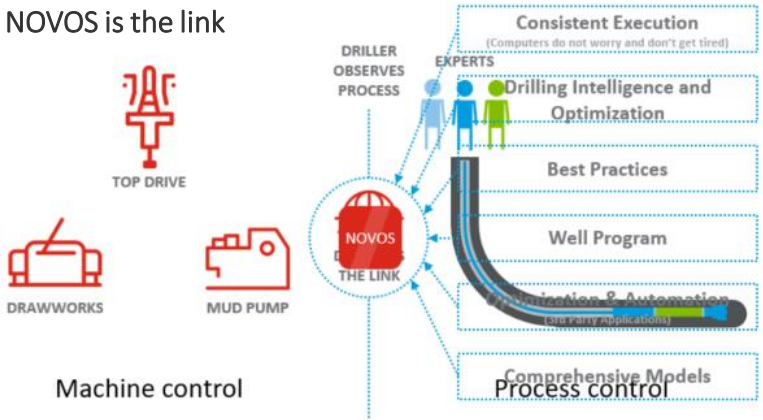
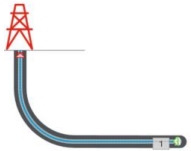
A digital drilling system

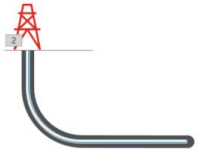


NOVOS is the link

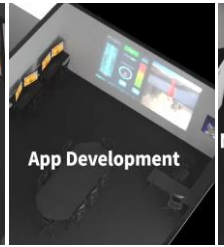


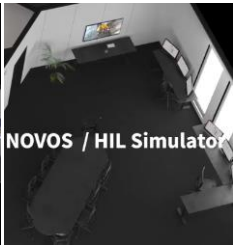


Mud pulse communication
ata rate 12 – 24 bps (bits per second)



Wired drill pipe
Coaxial cable enables 57,600 bps





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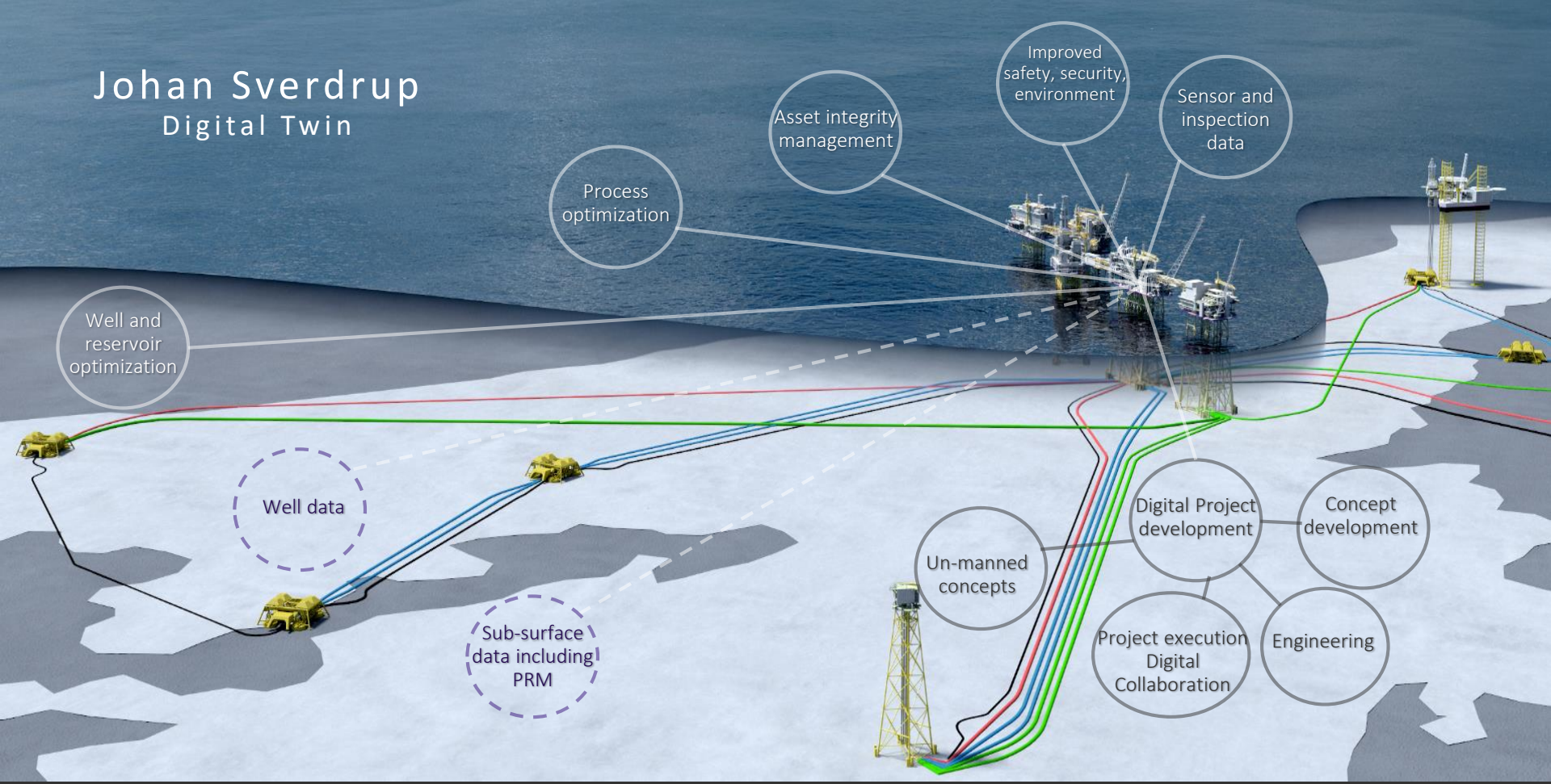
Digital Twin



*PRM = Permanent Reservoir Monitoring

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Riser platform

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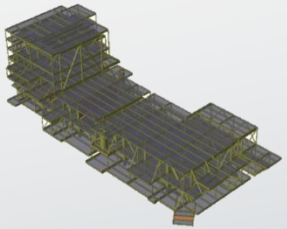
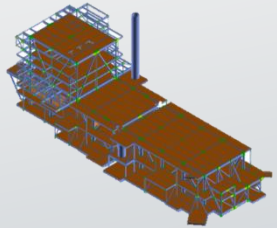
Aker Solutions' KBeDesign™: Automated engineering in 3D and Analyses

KBeDesign™ Work Process

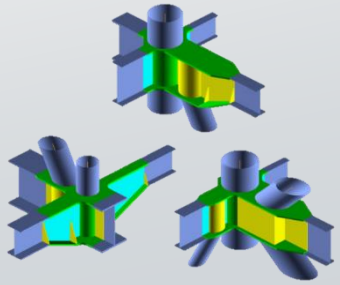
Analysis 2D model



De-idealizing and generating 3D KBE model



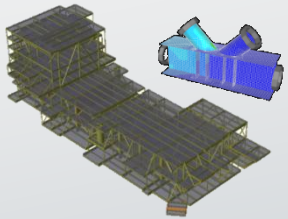
Automated detailing



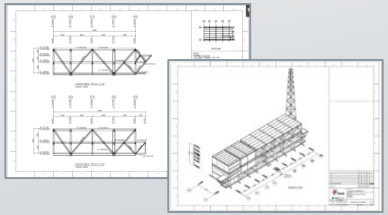
KBeDesign™ Output

Design calculations/ Node check reports

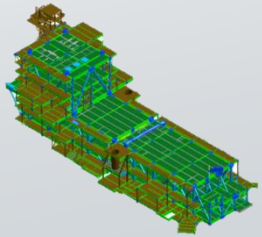
Updated global/ local analyses



Automated drawing production

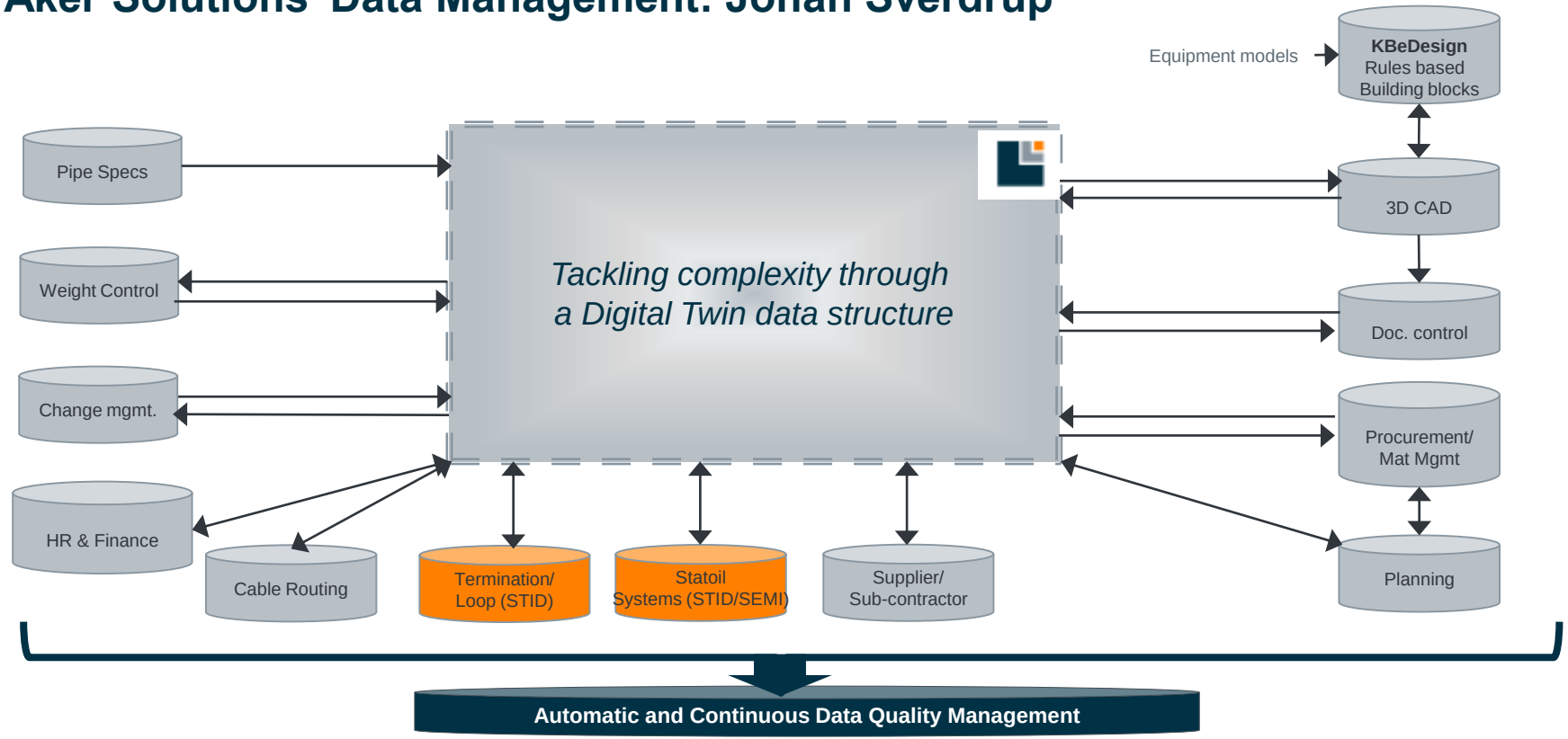


PDMS 3D



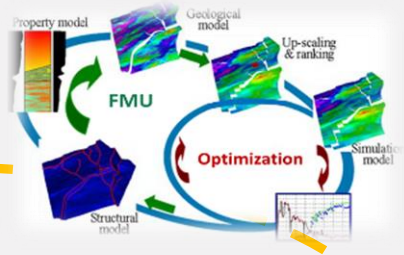
AkerSolutions

Aker Solutions' Data Management: Johan Sverdrup



Fully Integrated Digital Twin - a game changer for Johan Sverdrup

Improved safety, security and environment, increased asset integrity control and reduced maintenance cost



Increased accuracy of decision making by adding valuable well and reservoir knowledge, optimizing both short and long term production

Cross-discipline optimization using real-time simulation and visualization empowered by advanced data analytics

Increased efficiency in commissioning, design and construction

Reduced CO_2 emissions and energy consumption

Increased short term production potential by process optimization

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