Oliasoft | WellDesign™
Brønnplanlegging i en digital verdikjede

OG21-FORUM

12. november 2019

OLIASOFT

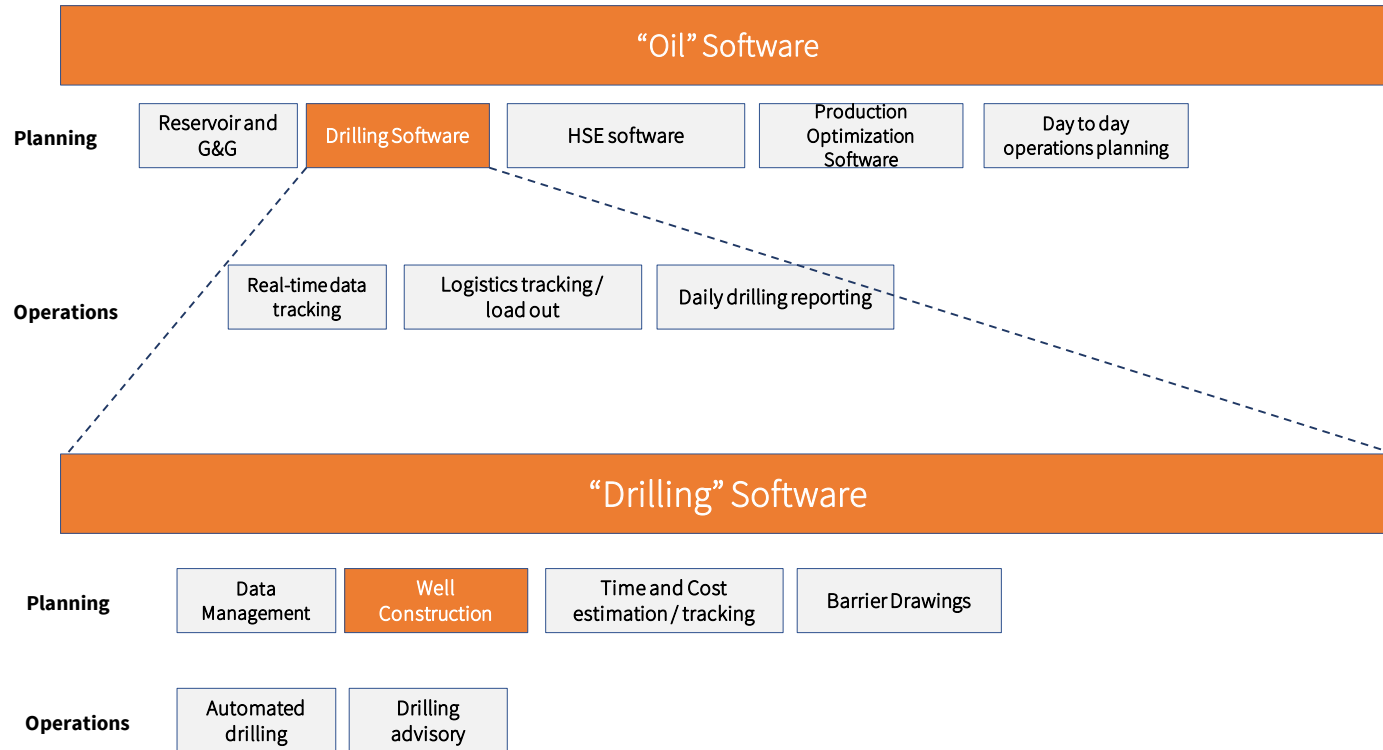**OG21 VISION: Technologies and Innovation for a competitive Norwegian Petroleum Sector**

TTA3 – Drilling, Completions and Interventions: Prioritized Technology Needs

OG21 VISION: TECHNOLOGIES AND INNOVATION FOR A COMPETITIVE NORWEGIAN PETROLEUM SECTOR

STRATEGIC OBJECTIVES:

- Maximize resource utilization
- Minimize environmental impact
- Improve productivity and reduce costs
- Develop innovative technologies
- Attract, develop and retain the best talents

TTA3 – DRILLING, COMPLETIONS AND INTERVENTION: PRIORITIZED TECHNOLOGY NEEDS

| Smart well solutions | Drilling and completion for challenging reservoirs | Drilling automation and autonomy | All electric subsea wells | Reduce intervention cost and increase reservoir exposure from existing subsea wells. |
| Energy efficient rig power generation | Plugging and abandonment of wells | High North wellbore positioning and navigation systems | High North shallow reservoirs drilling solutions | |

To reach this overall vision and the strategic goals, we need to start investing in innovative technologies that do not suffer from legacy issues.
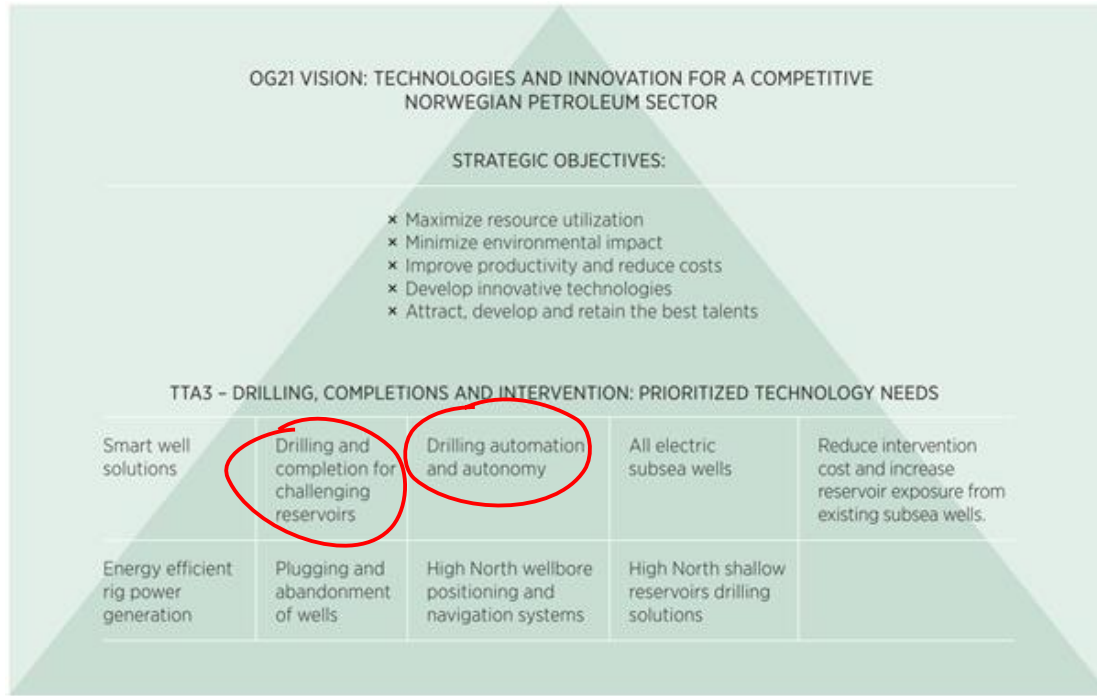
Oliasoft WellDesign is an Engineering Software for planning and real time monitoring of oil and gas wells

"Oil" Software

Planning

Reservoir and G&G	Drilling Software	HSE software	Production Optimization Software	Day to day operations planning

Operations

Real-time data tracking	Logistics tracking / load out	Daily drilling reporting

"Drilling" Software

Planning

Data Management	Well Construction	Time and Cost estimation / tracking	Barrier Drawings

Operations

Automated drilling	Drilling advisory

Oliasoft WellDesign™ in a Digital Environment

Machine-to-machine communication with any other application through open API

Automatic re-calculation of the full calculation chain during operation based on real-time data

Output of digital operation procedures for use by rig robotics and other 3. party applications
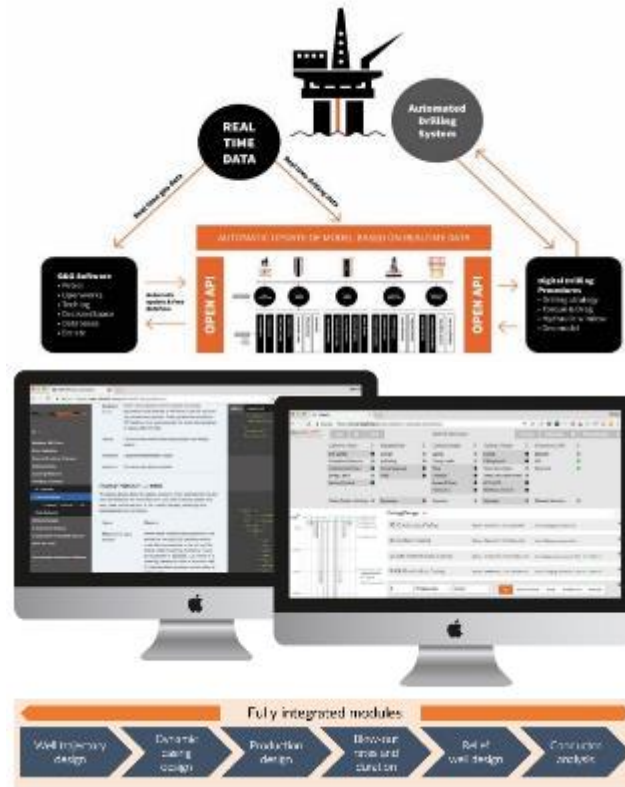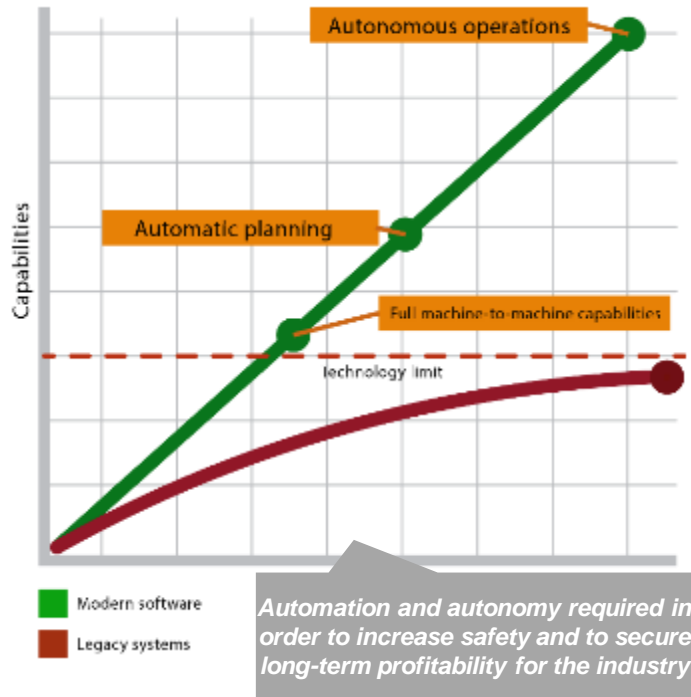

REAL TIME DATA

Automated Drilling System

Autonomous recalculation

OLIASOFT WELLDESIGN™

G&G Software

Open API

Open API

Digital Drilling Procedures

WELL TRAJECTORY

CASING DESIGN

TUBING DESIGN

BLOWOUT SIMULATION

CONDUCTOR ANALYSIS

Digital infrastructure – under construction - everything will be connected and share data

Digitized Infrastructure.
Everything will be connected.

Analytics
AI/ML

Big data and AI will optimize business processes

Work processes,
Business logic,
Automation routines

Oil Companies own / control;
Data, APIs and Workflow

G&G > D&W > HSE > Production >

bluware OLIASOFT UX TURBULENTFLUX

Resoptima EXEBENUS Sekal Petroleum Experts

Calculation engines, Simulators and Modelling engines
Domain specific applications executing oil companies value chain – data is shared and work processes automated

C3 IoT Cognite omnia

Data lake

Google Cloud Azure amazon web services™

Platform

Industry moving towards greater degree of automation and autonomy, which is only possible with modern technology, as legacy systems are held back by built in technical limits

Modern software enables automation and autonomy

Automation and autonomy required in order to increase safety and to secure long-term profitability for the industry

- **Data required to flow seamlessly between applications to achieve automation and autonomy**
- **Only possible through development of new calculation engines/software with machine-to-machine interfaces**
- **It is not possible to "fix" legacy systems from the 1990s due to inherent design limitations of older software**
- **New software required to meet authority rules and regulations in well design in order to maintain and improve high safety levels**

Usecase: Oil companies building custom front-ends

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Equinor is building Omnia. Uses Oliasoft Trajectory, Casing Design and Blowout APIs.

AkerBP is building DWP, which bridges legacy systems and DS365 from Landmark. Uses Oliasoft Blowout & Kill APIs.

| Well trajectory | Casing design | Tubing design | Blowout & Kill Simulation | Conductor analysis | Stochastic Oil Drift Simulations | Quantitative Environmental Risk Analysis |

Chevron is building its own front-end. Uses Oliasoft Casing Design, Torque and Drag and Hydraulics APIs.
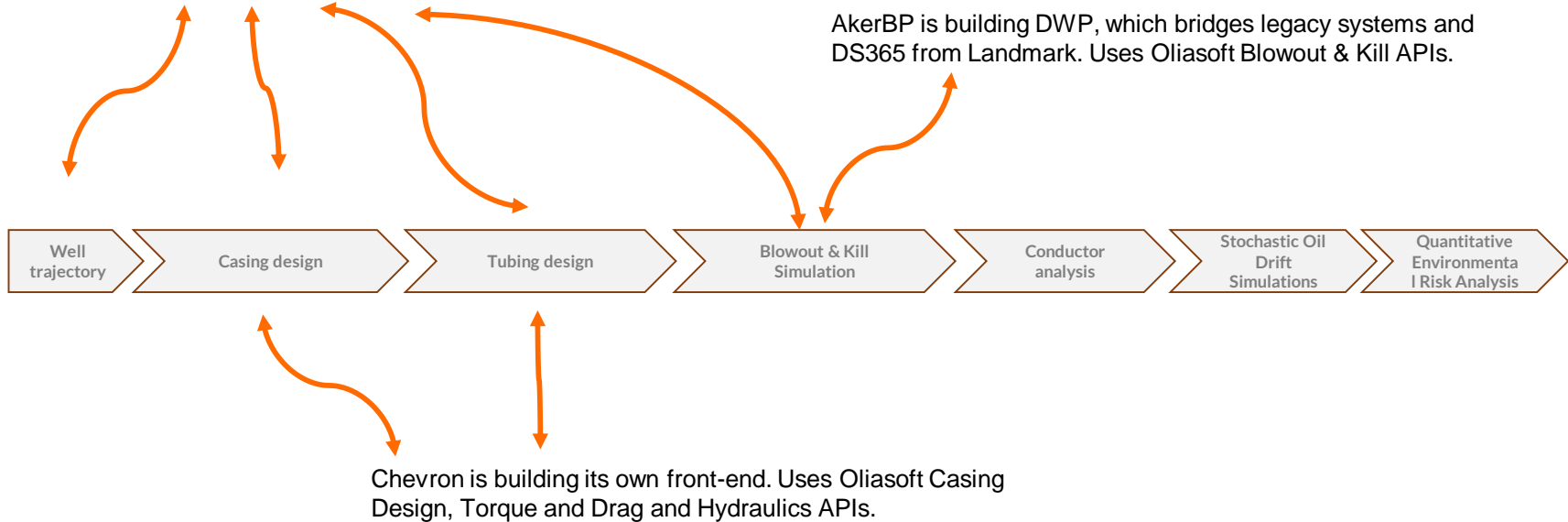
Key point: System composability (combining individual systems and parts like LEGO bricks).

Usecase: Automatic anti collision for reservoir modelling

Usecase:

Enable reservoir engineers to perform automatic anti-collision on thousands of well trajectories in Petrel, Engineering Desktop and other reservoir simulators
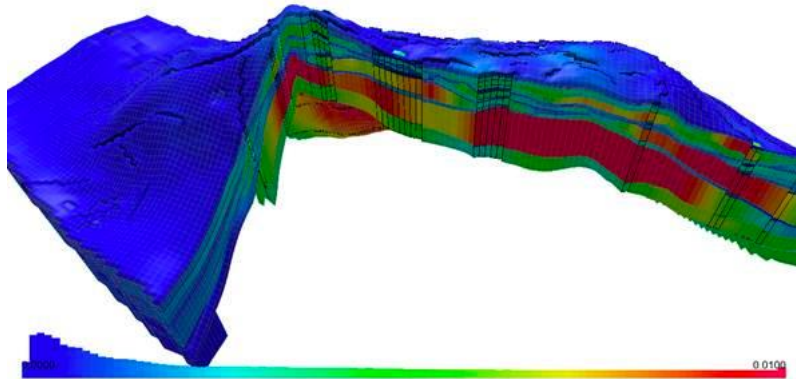
| Reservoir simulator | → ← | Oliasoft Trajectories API |

Value objective and participating partners:

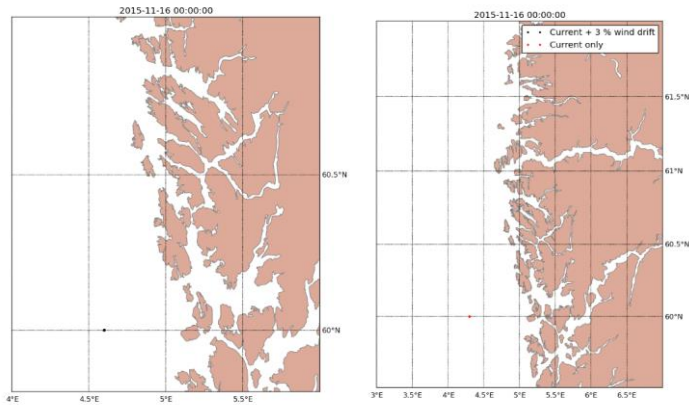Enable optimization of well placement / well productivity vs time & cost for realistic wells at an early phase.

Usecases: Automatic oil drift modelling on weather forecasts

Usecase:

Automatic oil drift modelling based on blowout simulations and weather forecasts

Meteorologisk instistutt API	→	**Oliasoft Blowout**	⇄	Sintef OSCAR

Value objective:

Enable automatic oil drift simulations on weather forecasts and historic data for step change in environmental risk analysis and emergency response.
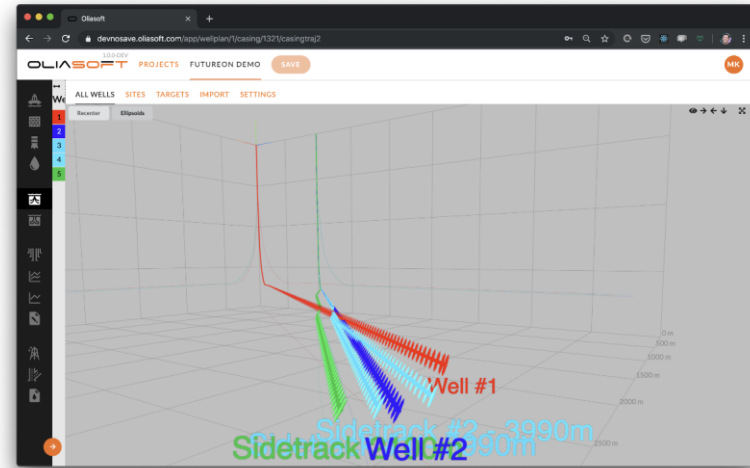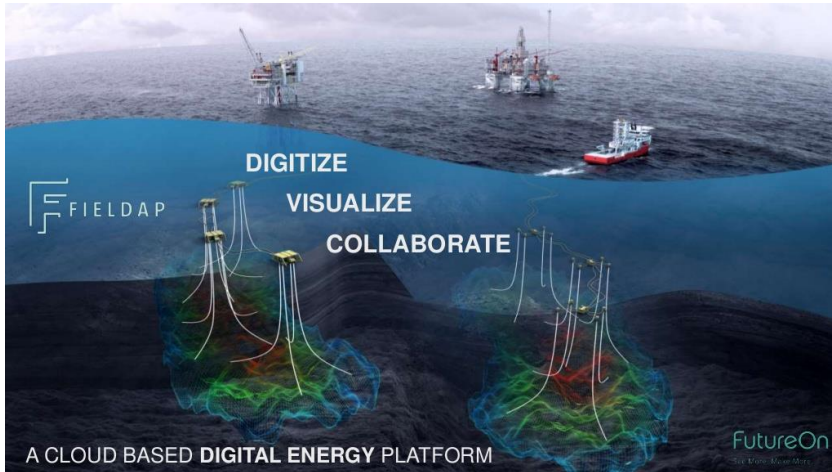
Usecase: Trajectory design automation

Get real-time/interactive rule-based estimates of drilling complexity, error modelling, time & cost etc based on wellhead placement directly in FutureOn Field app (drag and drop).

FutureOn FieldAP → Oliasoft Trajectories API

# Usecase: Enabling autonomous operations
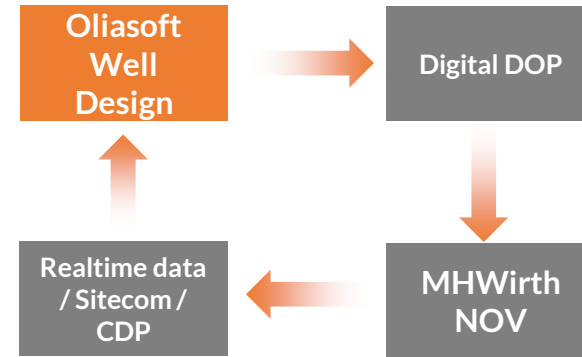
Usecase:

Enable autonomous drilling through digital operations procedures

Oliasoft integration

- Develop an adapter together with Oliasoft
- MHWirth is flexible regarding interface and communication technology
- Drilling, weight to weight and associated activities will probably be the first task implemented in the orchestration layer
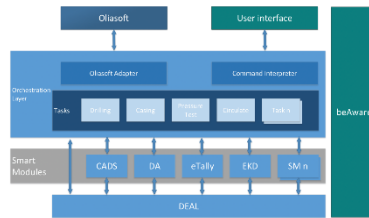
Value objective:

Enable automatic re-calculation of well design and well integrity in order to achieve autonomous drilling operations.

Takk for oppmerksomheten!