The Digital Twin for an oilfield

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Lars Meløe
Kongsberg Digital
Disruptive digitalization projects

Autonomous ships

Remote airport towers

Automated wind farms

Remote drilling
What is a Digital Twin?

- Comprehensive replica & accurate representation
- Advanced analytics and machine learning
- Static, historical and real-time data
- Technical to business operations usage
- Context dependent user interface
Digital Twin Screenshots
Evolving Operational Models

Integrated Operations Centre (IOC)
- Operations
- Production optimization
- Condition monitoring

Regional operating teams
- Operation centre (OPS)
- Production optimization group (POG)
- Technical integrity (TI)

Expert centres
- Turnarounds & corrective maintenance
- Plan based maintenance

Roaming maintenance teams
- Marine operations

Valenøyr
Oileberg
Krafts UPP

Logistics
Maintenance and planning
Emergency
«FieldOps» Loop

Field Development & Larger Modifications
- Engineering
- Commissioning
- Feasibility & Concept
- FEED

Operations & Maintenance
- Production
- Operation
- Mod
- Maintenance
New Operational concept
Monitor performance and solve problems

Remote analysis and investigation of incidents, and issuing of notifications
1- Faulty gaslift valve must be replaced.

2 – Reconfigure production settings to maintain production
PREPARING THE TEAM
Maritime Operation
Digital Twin through Life of Field

- Feasibility study
- Concept selection
- FEED
- Detailed Engineering
- Commissioning
- Production start
- Operation
- Maintenance
- Modifications
DIGITAL TWINS UNLOCK SIGNIFICANT VALUE FOR OPERATORS ACROSS THE VALUE CHAIN - EXAMPLES

Upstream value chain

- Exploration
- Drilling & completion
- Reservoir management
- Capital project delivery
- Operations and maintenance
- Supply chain & overhead

Capital project delivery

- 30% - 70% reduction of engineering cost and time
- Reduced materials costs
- Labor man hours reduced by 30-80% across multiple key processes

Operations and maintenance

- 5-15% higher production by higher uptime and prevention of unplanned events and failures
- 20-40% reduced maintenance costs
- 30-100% reduction of offshore manning

-30% cost
-30% time

+10 % prod.
- 20-60% cost

SOURCE: McKinsey, Multiple cases from other industries, e.g. airline, chemicals, agriculture, automotive; O&G pilots; Estimates