

Webinar Tuesday, May 22, 11am EDT

***Optimizing Offshore and Maritime
with Digital Twin & IoT Technologies
by Aegex + FutureOn***



FutureOn

See More. Make More.





FutureOn™

See More. Make More.

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Optimizing Offshore and Maritime with Digital Twin and IOT technologies

OFFSHORE DIGITAL - DRIVERS

2015-2017



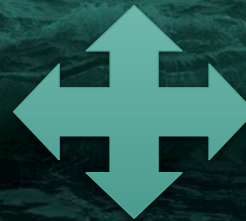
440 000 jobs lost since 2015
Industry Reinvention Mandate
M&A - Business Optimization

2018



Oil Price
Profitability
Stabilization

Future



Huge potential for Innovation
Efficiency gains
Increased competitiveness

Optimizing Offshore and Maritime with Digital Twin and IOT technologies

OFFSHORE DIGITAL - TRENDS

STANDARDIZATION

REAL TIME DATA STREAMING

ARTIFICIAL INTELLIGENCE

COLLABORATION

IoT / SENSORS

Automated
COSTING

API

CLOUD TECHNOLOGY

MACHINE LEARNING

CONTEXTUAL DASHBOARD

Optimizing Offshore and Maritime with Digital Twin and IOT technologies

OFFSHORE DIGITAL - TRENDS

BIG DATA

"Forrester Research estimates that **between 60% and 73%** of data that enterprises have access to **goes unused** for business intelligence and analytics"

IoT / SENSORS

REAL TIME DATA STREAMING



DATA SILOS

HISTORICAL DATA FEEDS



BIG DATA

ANALYTICS and MACHINE LEARNING
API
CONTEXTUAL DASHBOARDS

OFFSHORE DIGITAL TWIN

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OFFSHORE DIGITAL TWIN

WELL
PLANNING

FIELD
DEVELOPMENT

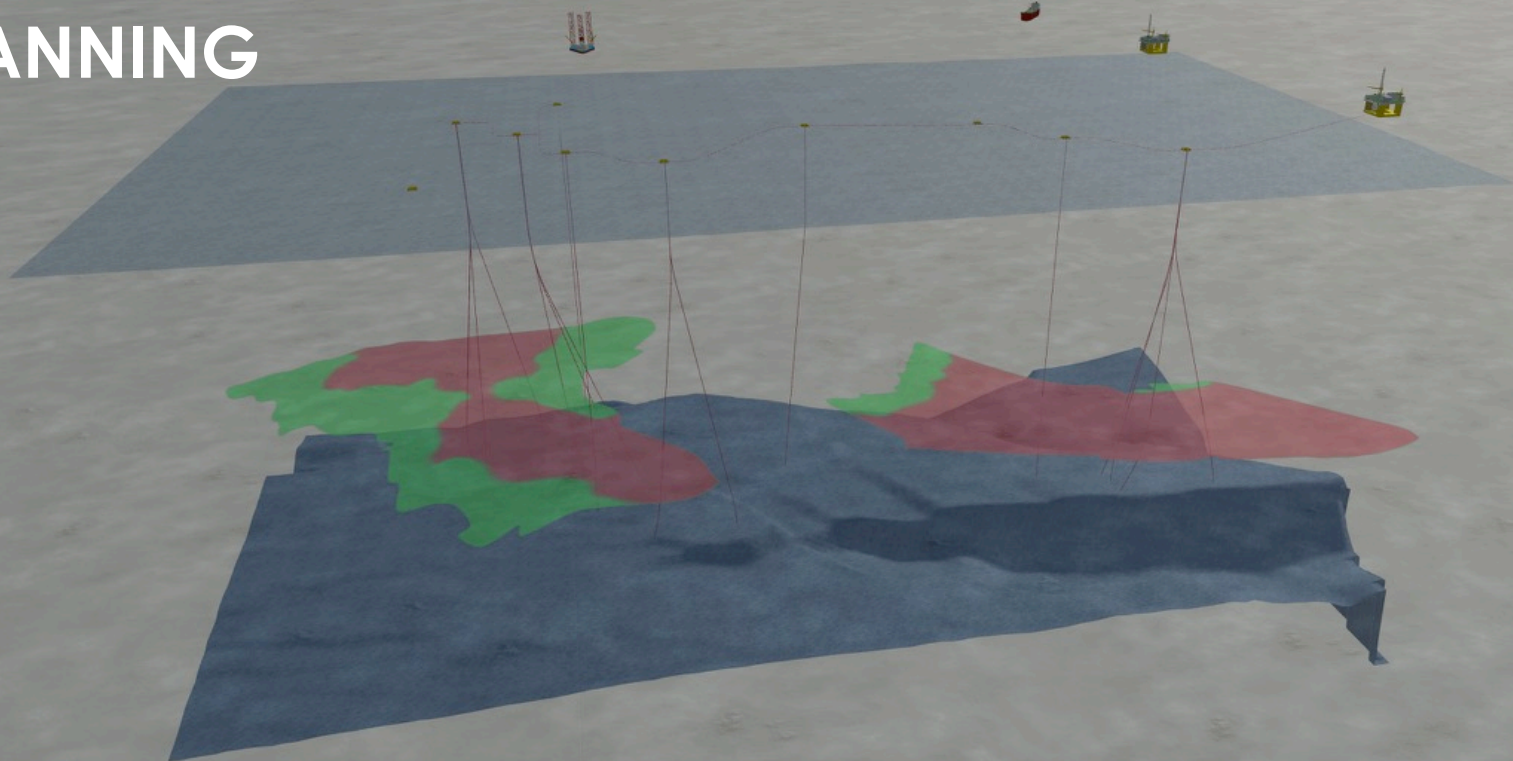
OFFSHORE
OPERATIONS

Innovation through Collaboration

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DIGITAL WELL PLANNING



DIGITAL FIELD DEVELOPMENT



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Browser address bar: <https://app.fieldap.com/project/55e6e406bb51a50300dbf23c/plan/stagedAsset/55e6e448bb51a50300dbf23f>

Subsea field layout

NAME: Template LAYER: 0 Forward Backward Scale 1 Heading -84.81 WELL: Select well

DIGITAL OFFSHORE OPERATIONS

Knowledge base / Template

Sort by View as icons Scale Search

- Template IMG2243.jpg
- Template Launch.jpg
- Template Overview.mov (5:22)
- Template Procedure.mov (2:43)
- Template Flythrough.mov (9:18)
- Template Schematics.pdf
- Template Tech.doc
- Template List.xlsx

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CENTRALIZED DIGITAL DASHBOARDS



DOMAIN EXPERT



PROJECT OWNER



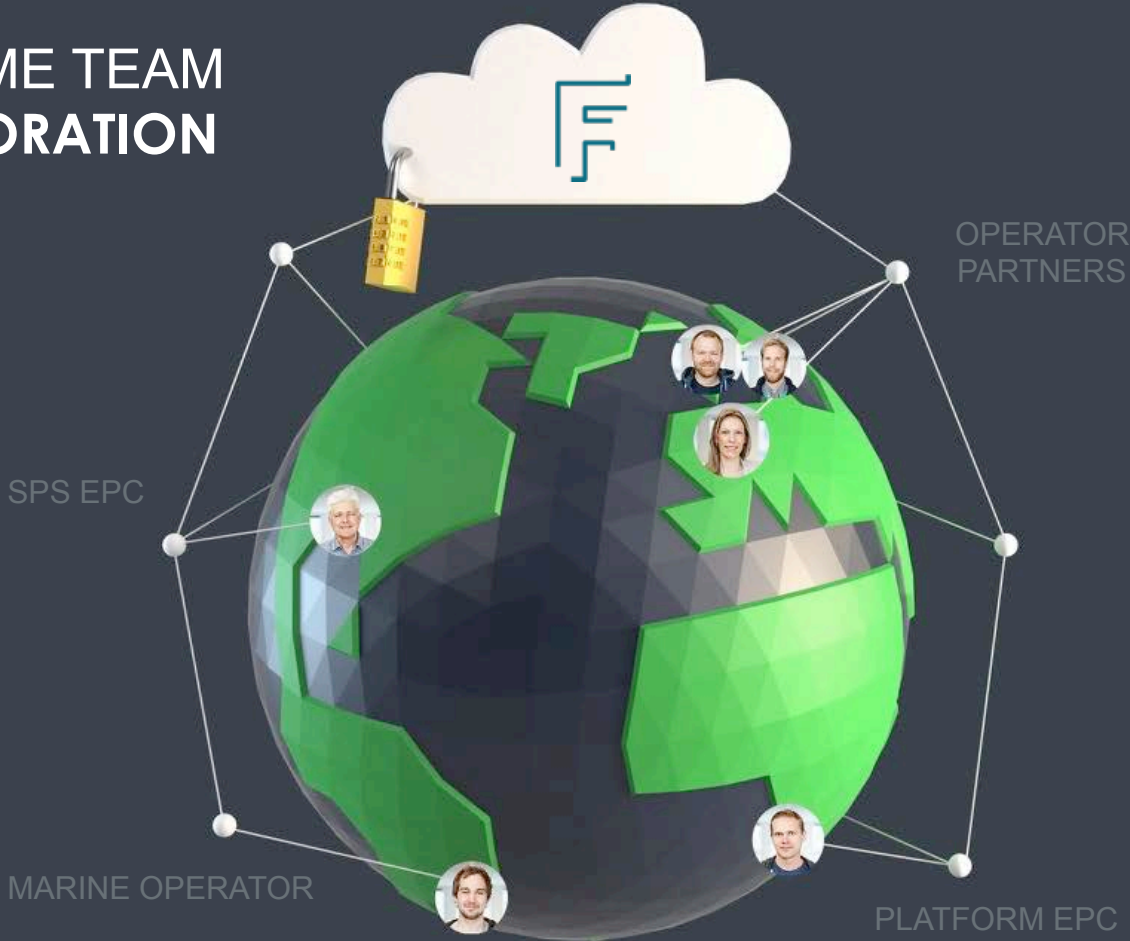
DEVELOPMENT

REVIEW & REFINEMENT

APPROVAL

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REAL-TIME TEAM COLLABORATION



Optimizing Offshore and Maritime with Digital Twin and IOT technologies



SUBSTANTIALLY REDUCING COST

- in the planning and design process
- for the operations by finding the best solution in the design phase

IMPROVED OPERABILITY

- Enabling digital working environment
- Instant global collaboration
- Cloud based and secure access



OSLO

HOUSTON

PERTH

DUBAI



REDUCED TIME TO MARKET

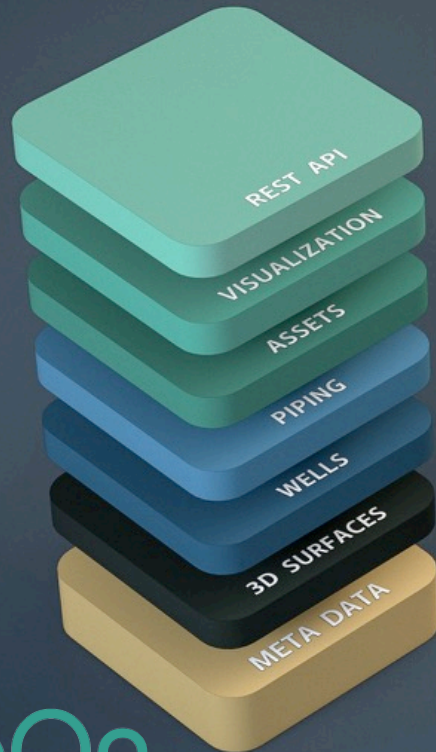
- Faster design process
- More efficient project iterations
- First Oil is accelerated

STRENGTHENED RISK MANAGEMENT

- Improving the quality of coordination
- Securing zero accidents tolerance
- Faster Knowledge of Integrity issues.

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CREATING THE **DIGITAL TWIN** START WITH YOUR **DATA**



HISTORICAL ARCHIVES
GIS AND MAP DATA
BATHYMETRY SURVEYS
RESERVOIR MAPS
PIPELINE / WELL PATHS
AS-BUILTS - P&ID'S
EQUIPMENT ASSET DATA

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FIELD DESIGN AND PLANNING

CREATE SMART ASSETS

Build or link your own data model to your private Asset Library or use the Generic library for equipment and costing options while designing the field.

ADD META DATA

Easy to use UI allows you to define your various equipment configurations and options and link them to your VendorID, WBS, cost specifications etc.

SPECIFY ATTRIBUTES

Wide range of data types, units, and input options for user selection on assets, connectors and connections.

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INSTANT COST ESTIMATES

Changes in the field layout are immediately visible in the cost module, allowing for interactive analysis.

COST TABS & CATEGORIES

Separate Tabs for Cost Equipment & Operations. Costs are automatically grouped into categories; SPS, SPP, PIPING & INFRASTRUCTURE, etc.

IMPORT/EXPORT DATA TO ANY FORMAT

Export cost and Bill Of Materials to MS Excel from the cost module with the click of a button. Or use the API direct with Excel macros.

COST SERVER INTERFACE

Interface with your own back-end on premise cost/calculation software for instant and accurate up to date cost calculations.

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Well data Asset Locator Project User Help

Infrastructure

Supplier	Cost	Curre...
	30,000,000...	USD
	1,250,000...	USD
	1,250,000...	USD
	1,250,000...	USD
	1,250,000...	USD
	6,500,000...	USD
	6,500,000...	USD

Infrastructure : 48,000,000.00 USD

Umbilicals

Name	Supplier	Cost	Curre...
▶ Umbilical		1,260,000....	USD
▶ Umbilical		1,260,000....	USD
▶ Umbilical		1,260,000....	USD
▶ Umbilical		1,260,000....	USD
▶ Umbilical		6,800,000....	USD
▶ Umbilical		1,260,000....	USD

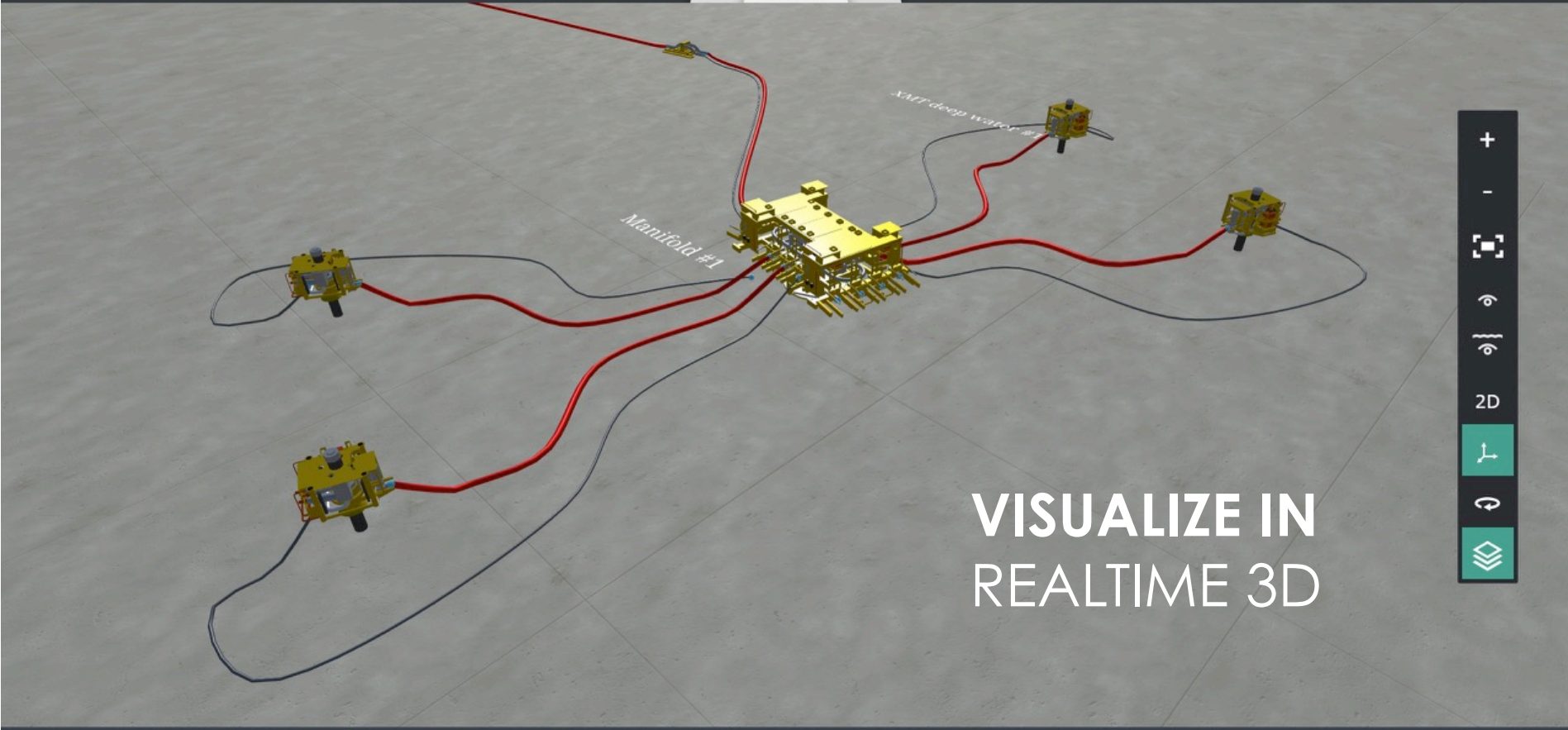
+ Add item

Cost Umbilicals : 13,100,000.00 USD

Total sum:

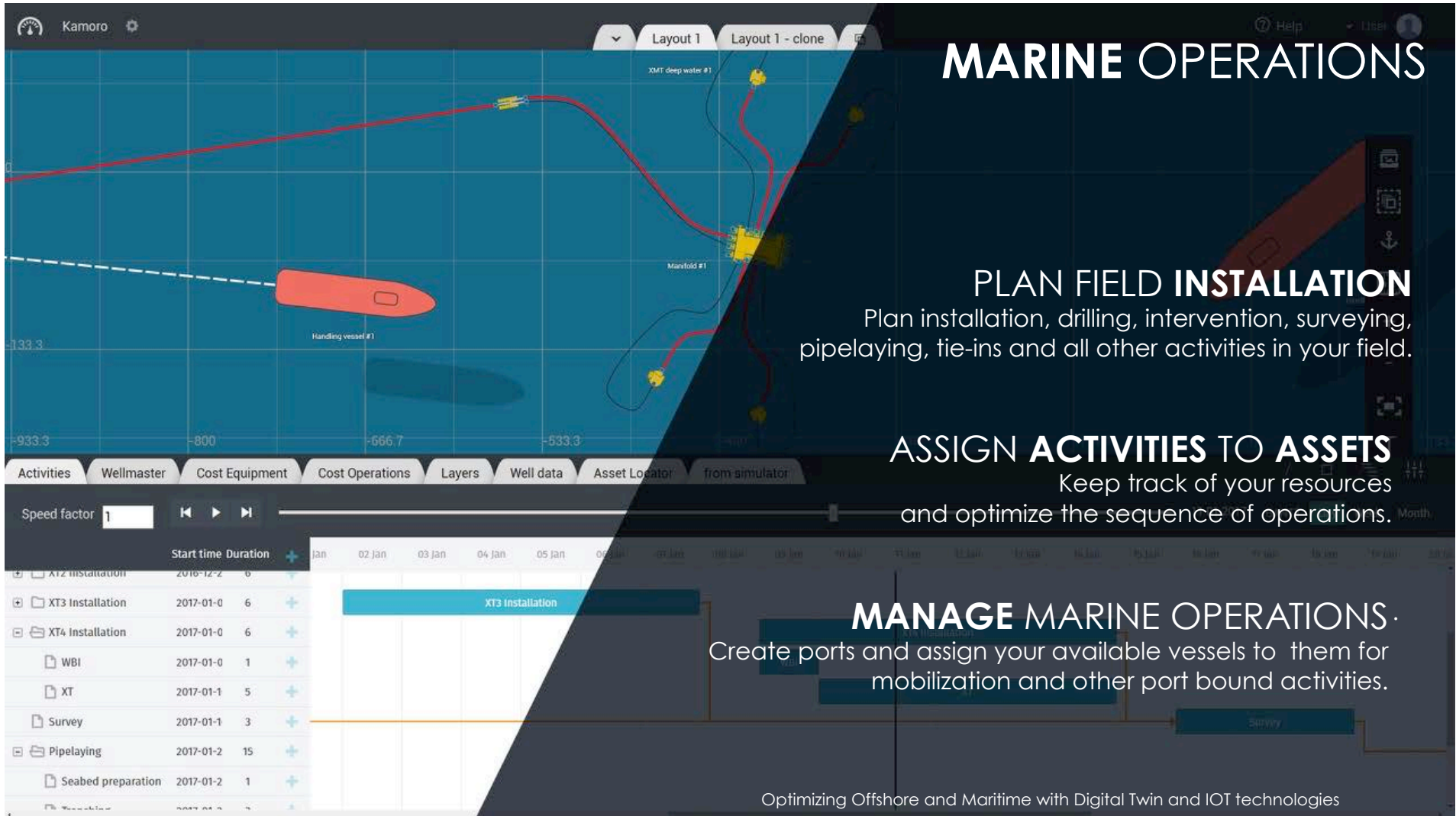
Equipment: 193,600,000.00 USD

Operations : 0.00 USD



Vertical toolbar with icons for zoom in (+), zoom out (-), full screen, pan, 2D view, and a home icon.

**VISUALIZE IN
REALTIME 3D**



MARINE OPERATIONS

PLAN FIELD INSTALLATION

Plan installation, drilling, intervention, surveying, pipelaying, tie-ins and all other activities in your field.

ASSIGN ACTIVITIES TO ASSETS

Keep track of your resources and optimize the sequence of operations.

MANAGE MARINE OPERATIONS

Create ports and assign your available vessels to them for mobilization and other port bound activities.

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FIELD OPERATIONS

INTEGRATE WITH LIVE IOT DATA STREAMS

Complete Demo Project - clone

Issue Log

- Template 4 slot with 2 xmt #1 humidity 50.27% (exceeded)
- Template 4 slot with 2 xmt #1 temperature 29.30° (exceeded)
- Template 4 slot with 2 xmt #1 humidity 50.74% (exceeded)
- Drill Center 3 P temperature 30.62° (exceeded)

Template 4 slot with 2 xmt #1

General Data Real Time Data Historical Data

Temperature **29.96°**

Humidity **50.94%**

Artificial Data Feed

Exceed Threshold

Settings

Scale:

1 - Real world scale

Powered by FieldAp



DIGITAL TWIN LIFE CYCLE USE CASES

Well Planning

Field
Development

Installation,
completion &
Intervention

Offshore and Marine
Operations

P & A

Innovation through Collaboration

Identify optimal well
paths

Run Offset
Simulations

Test models with
Analytics

Field Layout
Optimization

Predict installation
types & costs

Run Field Simulations

Benchmark to select
the best equipment
for your
environment

Familiarization

Training

Forecast planned
activities

Avoid unplanned
interventions/
downtime

Minimize planned
downtime

Benchmark your
installation success rate

Marine Planning

Custody Transfer

Optimise installation,
modifications,
intervention and
maintenance

Connecting
information

Activity tracking and
measuring

Schedule P&As
according to risk
picture

Decommissioning
plan

DIGITAL FIELD OF THE FUTURE

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FIELD DEVELOPMENT

Use Case 1

Global Oil Services Company

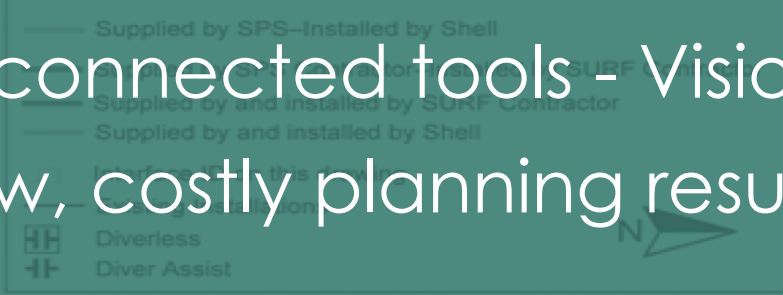
Challenges

Traditional Siloed workflow.

Disconnected tools - Visio, MS Paint and Excel.

Slow, costly planning results - delays.

Brynild Base Case



Abbreviations:	
IOPPS	Instrumented Over Pressure Protection System
MDS WIM	Main Drill Site Water Injection Module
MPFM	Multi Phase Flow Meter
PL	Pig Launcher and Receiver
PI	Pig Launcher
PIR	Pig Receiver
RBM	Riser Base Manifold
SCM	Subsea Control Module
SPS	Subsea Production System
SURF	Subsea Umbilical, Risers & Flowlines
SUTU	Subsea Umbilical Termination Unit
WIRB	Water Injection Riser Base
XT	Christmas Tree



SUPPLIERS



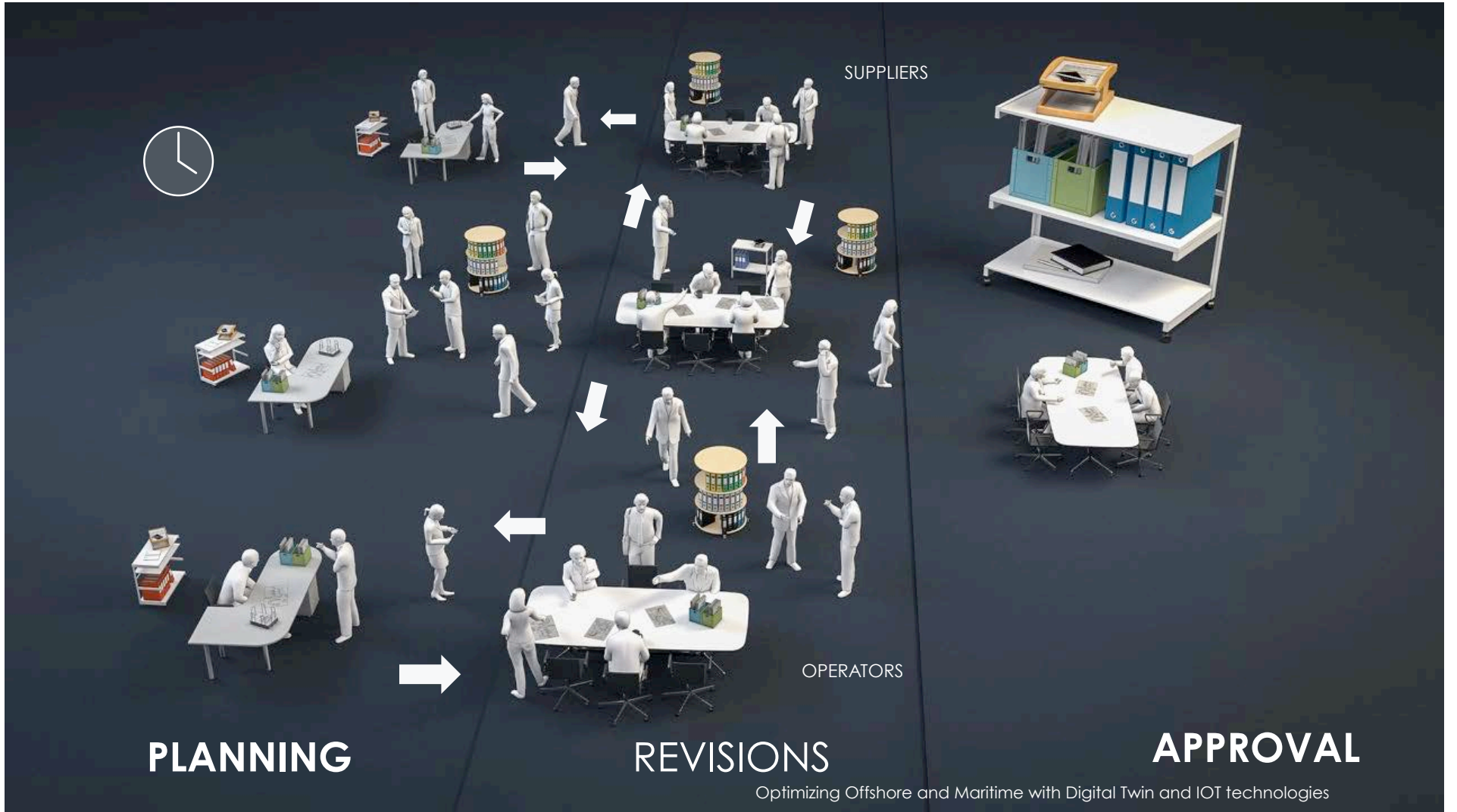
OPERATORS

PLANNING

REVISIONS

APPROVAL

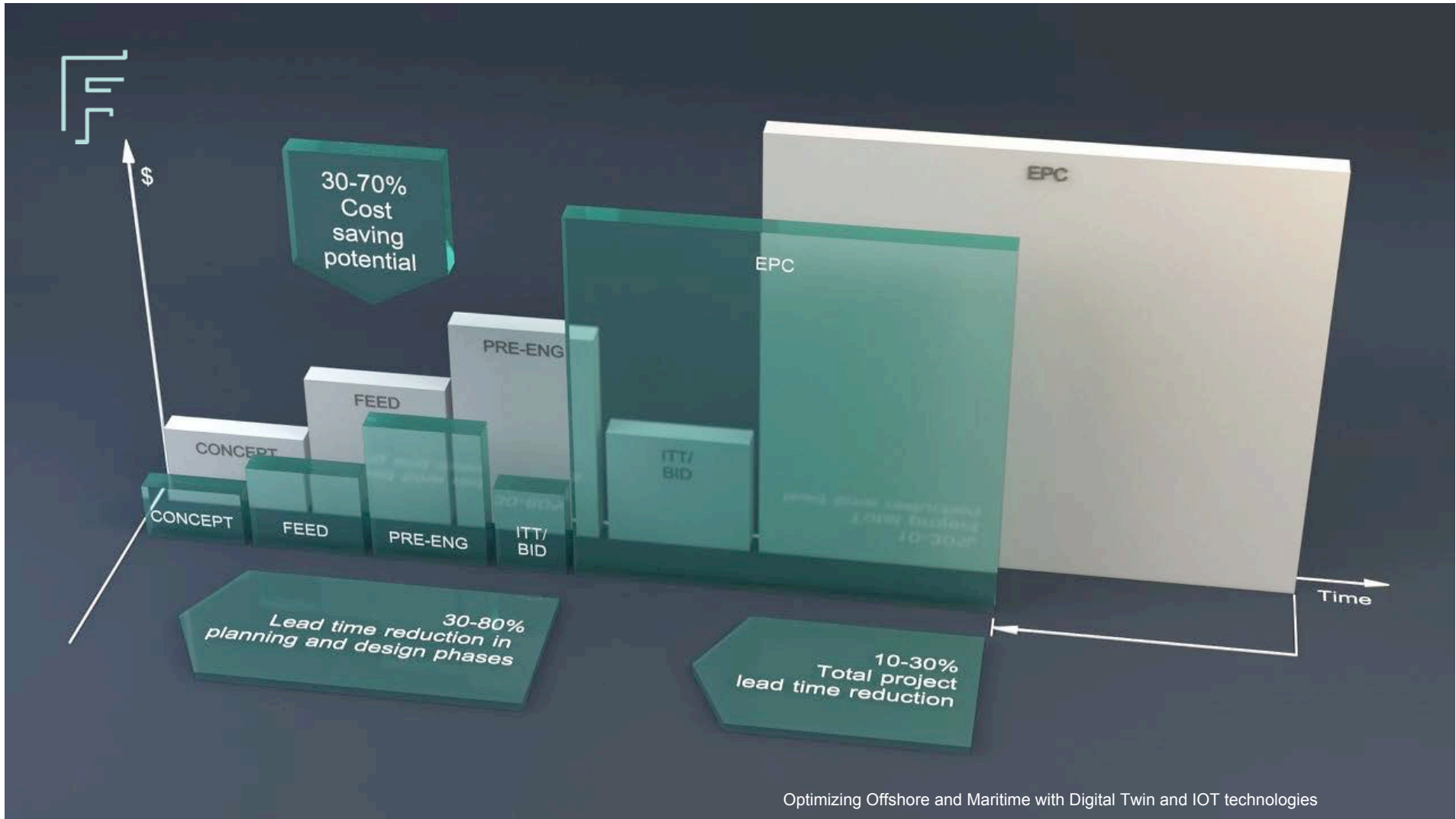
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UP TO DATE PROJECT DATA SECURELY ACCESSIBLE FROM ANYWHERE, ANYTIME.



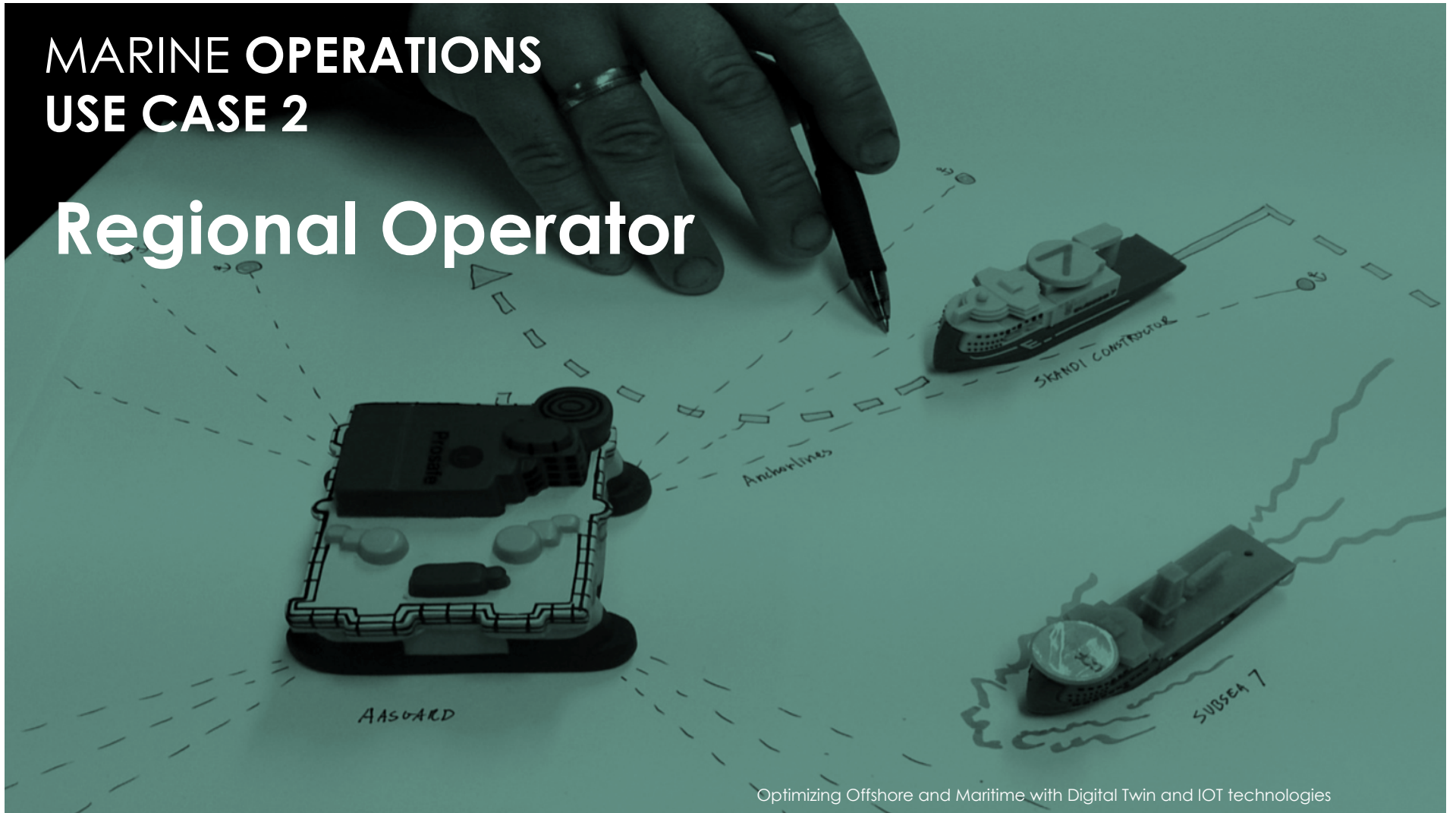
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MARINE OPERATIONS USE CASE 2

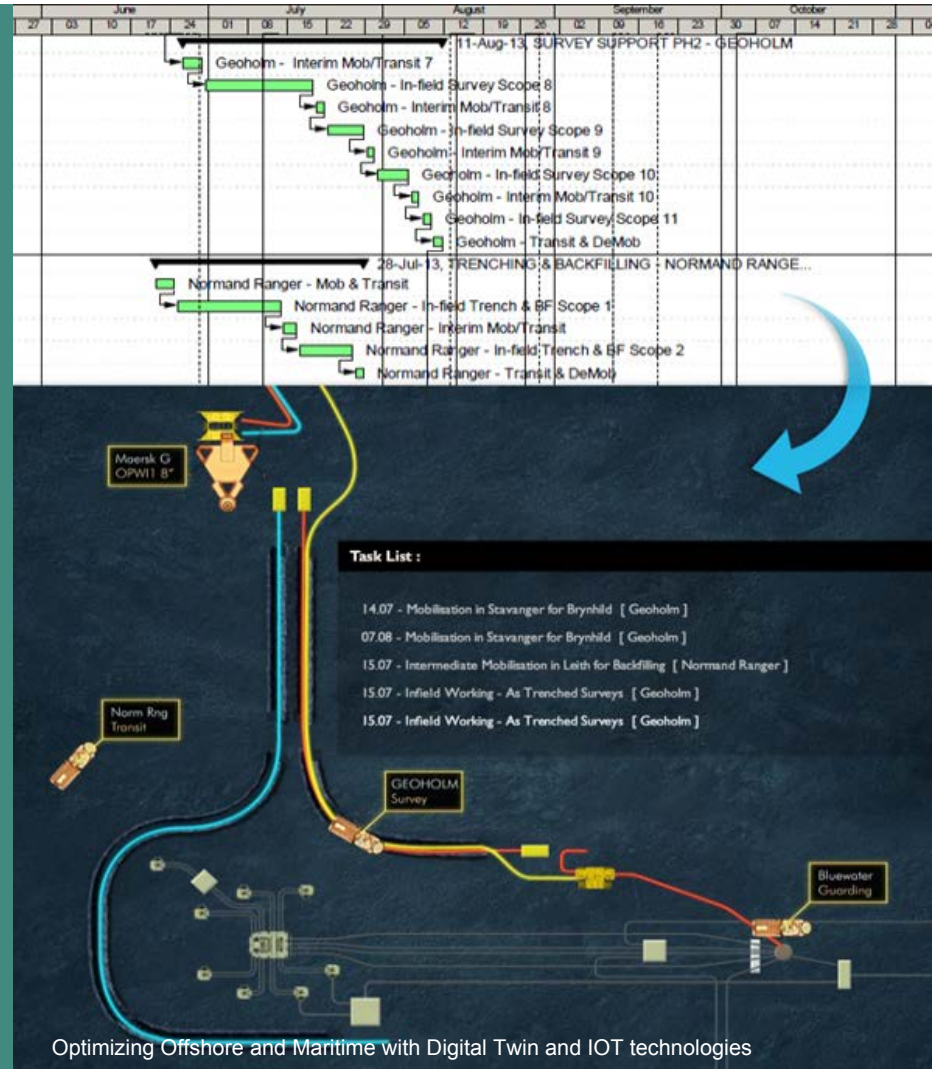
Regional Operator

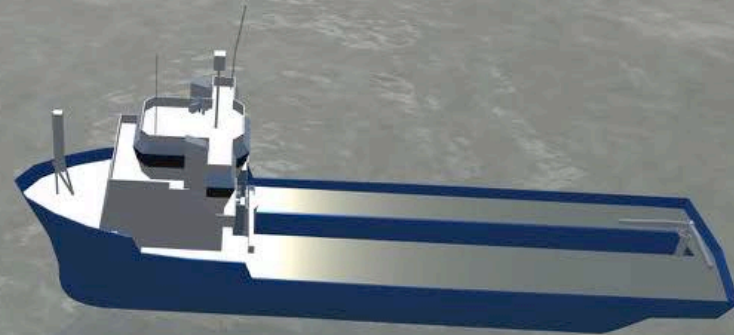


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CHALLENGES

Planning Conflicts
Lack of connected data sources.
Idle vessels





REAL TIME DECISIONS USING 3D VISUALIZATION WITH LIVE DATA FEEDS



COST SAVINGS

SIGNIFICANT DAY RATE SAVINGS
USING PLAN VISUALIZATION

REDUCED LIABILITIES

MULTIPLE RISK INTERVENTION
OPPORTUNITIES IDENTIFIED

INCREASED ACCOUNTABILITY
GREATER INSIGHT INTO LOADING
AND OFFLOADING FPSO



70 percent of digital transformation initiatives will ultimately fail: (IDC)

Insufficient collaboration

Missing systems integration

Failed project management

Lack of up to date or correct data



Digital Transformation success depends on willingness to transform

Who: People and Culture


How: Willing to change attitude and mindset

What: Open to new process and ideas




SUCCESSFUL ADOPTION OF DIGITAL TRANSFORMATION


 Collaboration across the board


 Single Source of the data truth


 High Quality of communications


 Accelerated decision making


 Always on, cloud-first architecture


 Open access to all data

 100% digital working environment

 Substantial cost saving

 Reduced time to market

 Improved operability

 Strengthened risk management



IMPROVED OPERATIONAL PERFORMANCE



INCREASED FIELD PROFITABILITY



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