



WHEN TRUST MATTERS

# Digitalisation

## Oil & Gas and Maritime industries

Standard morgen breakfast seminar

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# READI - Shaping the future of digital requirements and information flow

- a journey from paper based to machine readable standards and documentation

## Background



Konkurranseskraft  
- norsk sokkel i endring

Utvalgets rapport, februar 2018

**Digital transformation of business processes** for field development and operation

We need a **common digital language and framework** enabling efficient flow of information between disciplines and work processes

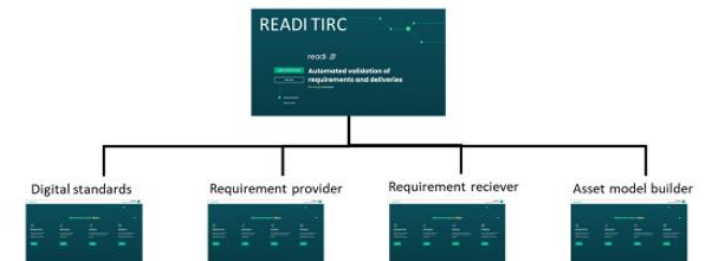


## Participants

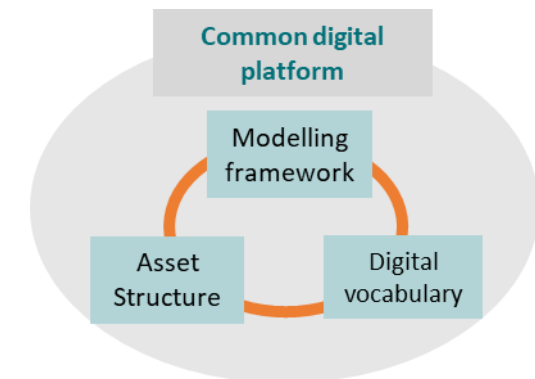
Category	Company
Operators	Equinor
	ConocoPhillips
	Aker BP
	Lundin
	Shell
	Vår Energi (Eni)
EPC Contractors	TechnipFMC
	Aibel
	Aker Solution
Equipment and system vendors	ABB
	Computas
	Proenco
Authorities	Petroleum Safety Authority
	Ministry of Petr. and Energy
Others	Standard Norge
	DNV
	Sector Board Petroleum
Observers	NOROG
	POSC Caesar Association
	Norsk Industri

## Results

Industry services for governance and application of digital requirements in the supply chain



Standard for modelling of digital assets



# Drive significant savings by means of digitalisation of documents and requirements across the asset lifecycle

**Human readable**  
Copying and pasting information  
Document based verification

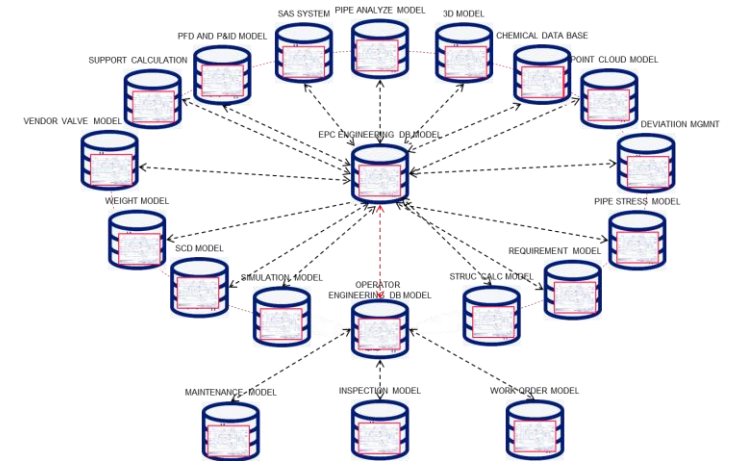
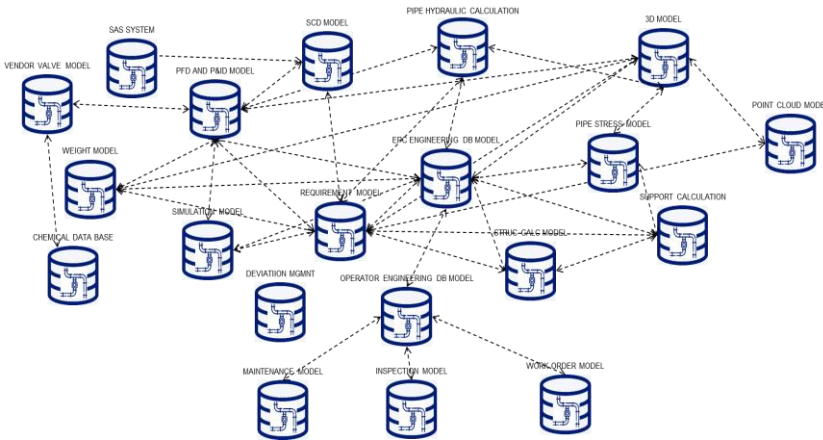


**Machine readable**  
Machine based communication  
Automated verification

**Industry standards**  
**Semantic technologies**

## READI deliverables:

- Services for governance and application of digital requirements
- Standard asset breakdown structure
- Standard for digital vocabulary and language
- Information Modelling Framework – guidelines for development of digital asset models



Operator Contractors Suppliers

**From documents & paper to object centric information**  
**Shared data formats to enable Digital Twins**

# Why is READI of interest to DNV and the industry in general?

To create lifecycle sustainable digital twins and digital assets it must be based on:

- A recognized standard with a common digital language and framework
- A stable data format structured according to logical information models

Benefits and opportunities for the industry

- Increased scalability deployment and operation
- Security and safety for the entire value chain
- Standardized integration points
- Increased interoperability between data sources
- Automation of knowledge intensive work processes
- Alignment of standards, structure and models with the physical asset
- Life cycle centric
- Secure quality in all elements

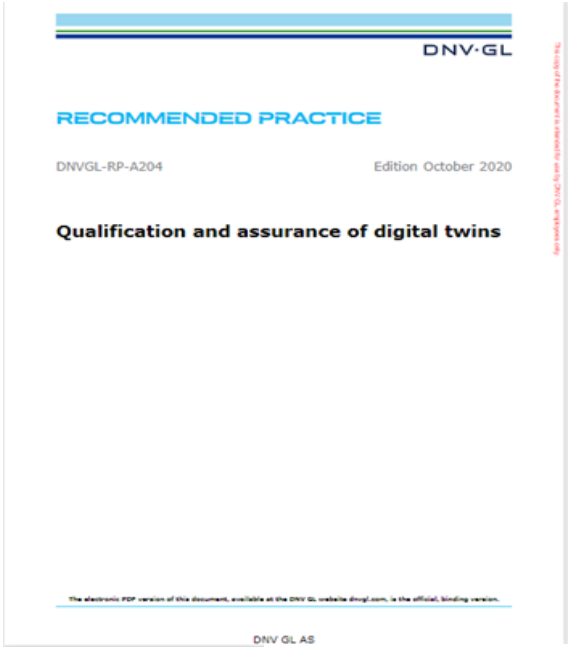
This enables DNV to:

- Secure alignment between physical assets and digital assets through common standards.
- Build digital twins and integrate our services and products onto these digital twins based on common standard driven data models across the industry.
- Do assurance of digital assets against defined and commonly used standards in the industry.

# Digital framework and standards from READI enables assurance of digital assets

Digital **transformation of business processes** for asset/field development and operation  
A **common digital language and framework** enabling efficient flow of information between disciplines and work processes

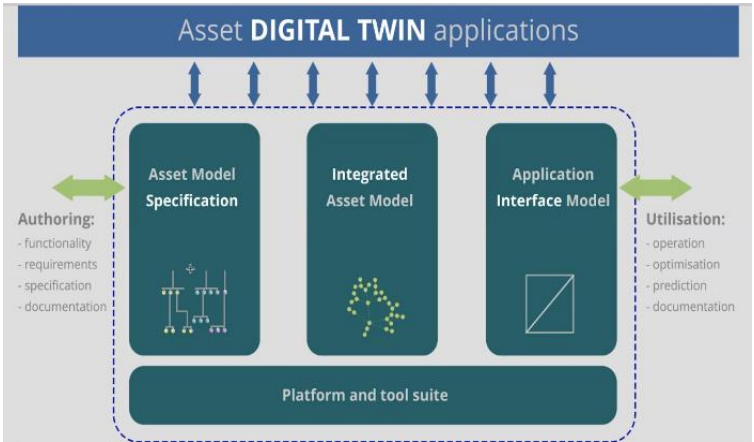
## Recommended practices



## Assurance of digital twins



## Asset information modelling services and tools



# Digital Solutions offers Performance and Assurance Solutions in offshore wind

Semantic Technologies **READI** 

Digital **transformation of business processes** for asset/field development and operation

A **common digital language and framework** enabling efficient flow of information between disciplines and work processes

## Recommended practices

- Provide leading standards and RPs for modelling of digital twins (DT):
  - DT qualification and assurance RP-A204
  - DT data quality RP-0497
  - DT algorithm quality RP-510
  - DT sensor system quality RP-0317
  - DT simulation models RP-0513
- Governance of standards and RPs for machine-based communication and automated verification
- Develop and host digital, machine-readable requirements

## Assurance of digital twins

- Leading position on digital twin assurance based on DNV RPs
- Develop run time services for monitoring, change and optimisation of digital twins in asset operations
- Ensure trustworthy digital twins for decision making in Asset Performance Management including data quality, sensor systems and algorithms/ML
- Model and assess digital twin interfaces to transmission and grid demand

## Asset information modelling services and tools

- Develop and provide tools and services for building of digital asset information models
- Build and host digital asset information models based on semantic technologies and DNV platform capabilities
- Deliver digital asset information models to:
  - Support digital twins and associated services provided by Energy Systems and Maritime
  - Enable integration of DNV software packages into true eco-system

# DNV

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