

OUR AMBITIONS

Clear ambitions to deliver on our strategic legs

- Long-term value creation from oil & gas
- Profitable and disciplined growth in renewable energy production
- Increasing CCS ambitions toward 2035



Turning natural resources into energy for people and progress for society

Recently extended:

Searching for better





OUR PORTFOLIO

Profitable portfolios of sanction and non-sanctioned projects (O&G only)





Our technology mission

Transforming through technology

Our digital vision

Changing the way we provide energy



Make better data-driven decisions – every day

Strengthen safety and security with data and analytics

Robots and automation at scale will increase value creation



Connecting minds and technology to become industry leader

Key challenges - in a nutshell



What to resolve

Lack of standardisation impedes coupling of data

Variation in how we represent, store, share and handle data

Facilities documented differently in multiple sources and systems

Context is added multiple times to the same data

Engineering data are <u>not seamlessly</u> connected with operational data

..all being impediments that adds huge risk to the realization of multiple value cases



How to resolve

Make data more available, transferable and accessible by...

...enriching data and enabling machine readability in a standardised way

...structuring data, also improving feasibility of using the external market

Agree on standards and reference architecture for the facility domain... ...allowing common data model(s) and thereby scalability and

interoperability

..all being dependent on a coordinated and aligned change effort to build the technical foundation





Definition of interoperability

From ISO 19941

Interoperability is the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged.



transport interoperability

where information exchange uses an established communication infrastructure between the participating systems

syntactic interoperability

such that the formats of the exchanged information can be understood by the participating systems

semantic data interoperability

so that the meaning of the data model within the context of a subject area is understood by the participating systems

behavioral interoperability

so that the actual result of the exchange achieves the expected outcome

policy interoperability while complying with the legal, organizational and policy frameworks applicable to the participating systems Making it challenging for all to "speak the same language" and thus impeding optimizing operations, improving decisionmaking, and maximizing efficiency

Data is generated from a wide range of sources, including sensors, devices, machines, software applications, and enterprise systems

These data-generators are often built by different manufacturers... ...that use various data formats and communication protocols One perspective on the interoperability struggle of today



Modbus Profinat	ITTP Fieldbus	Time-Series	Binary	JSON	XML
TCP/IP HA	OPC UA	Data Formats	S CSV	HDI	75
EtherNet/IP P1	DNS rofibus FT	Proprietar	y / Protocol-Specific Formats		

using







Perspective further elaborated

Data challenges in utilizing data across facility life cycle and value chains





The ever-increasing pile of technical information documents Is pdf 'digital representation'? Well, much harder to automate than 'digital data' anyway



Current documentation practice during an industrial investment and development project



Using Information Models instead of documents during an industrial investment and development project

Source: IMF Manual

There are thus many why's of interoperability – Let's address eight of them



Streamlined operations and efficiency Data sharing across systems and End-to-End automation

Better decision-making Unified data for insights and Predictive maintenance & optimization



Flexibility and scalability Integration of new technologies and Vendor independence



Improved collaboration Cross-team & cross-company collaboration and Supply chain coordination



Cost savings Reduced redundancies and Lower integration cost



Enhanced data security and governance Consistent data management and Compliance with regulations



Adaptability to emerging technologies IoT & Industry 4.0 and AI & Machine learning integration

Disaster recovery and business continuity Data redundancy and backup







Data as a product

70 petabytes

Cloud-based and available across Equinor

'Production' increases its value

Will improve operations, safety, reduce CO₂

Making data more shareable



And always remember – The core *is* cool

Solid technical foundation enables new features

Standardisation is essential – across industries

Vital part of our digital journey



Our vision is to have an interoperable fundament to accelerate data-driven decision-making across life cycle, value chains and disciplines





Interoperability vital to unlock the potential of artificial intelligence

- Access to diverse data sources : Al models rely on large datasets to learn and make predictions
- Seamless Al deployment : AI solutions often need to be deployed across different platforms
- Improved Al model training: AI requires Standardized Data Formats for effective model training
- Enabling real -time decision making : Fast Data Exchange in environments where AI makes real-time decisions
- **Combining Al with IoT (AloT):** IoT devices generate data that AI systems analyze
- Integration across cloud services: To utilize hybrid or multi-cloud environments, leveraging different cloud services (e.g., AWS, Azure, Google Cloud)



Connecting minds and technology, developing people and partnerships - Searching for better

Our people make it happen

The best of people to get the most out of technology Equinor – the data-driven energy company!



Thank you for listening!

Per Erik Bøe Hansen

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