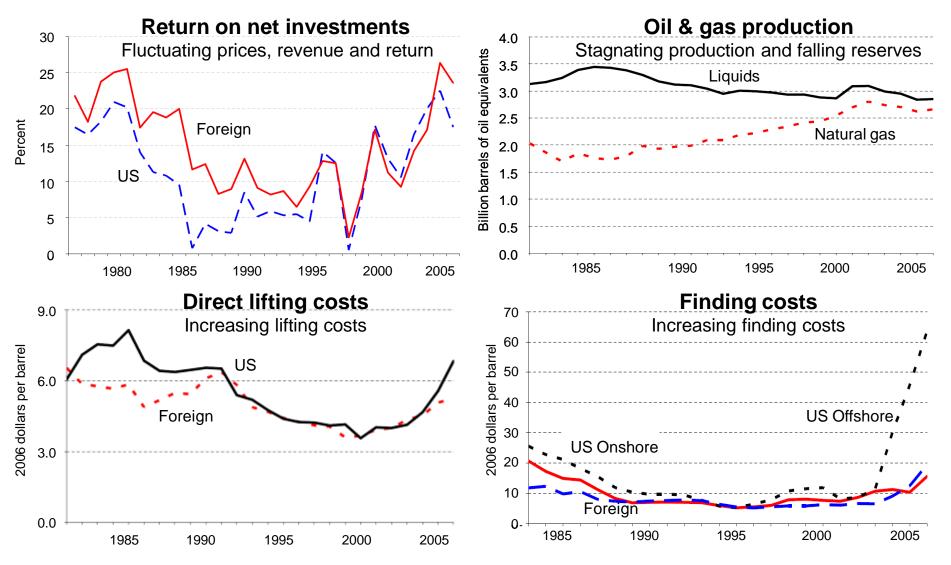


### Practical Innovation. True Integration. Connected Operations.

# IBM and ISO 15926

### Kaare Finbak, IBM Chemicals & Petroleum

# The oil & gas industry faces several challenges



Source: US DOE, 2007, Financial Analysis of the 16 largest US oil and gas companies

# Better utilization of information available is part of the answer

# 1 terabyte

200 DVDs' worth of data generated by on oil field daily. Oil and gas engineers can spend up to 60% of their time mining this data

# **85%** reduction in seismic mapping

New technologies and algorithms exist that significantly reduce the time to map and analyze oil and gas reservoirs, thereby speeding time to recovery

# 90,000

Man-hours required to execute turnaround effort every two years on an offshore platform.

# **10%** improved asset utilization

Adopting best-in-class asset management strategies can reduce asset downtime by 10%.

## 33%

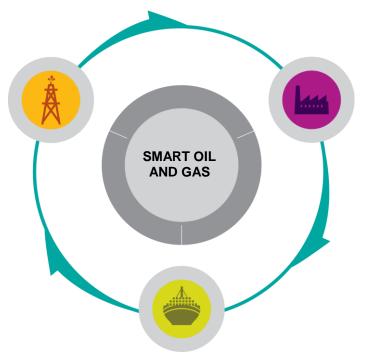
Amount of oil, on average, that is recovered from an existing reservoir.

# **1.5%** increase in oil recovery

A 1.5% increase in recovery from existing wells, on average, would yield enough oil for half a year's global consumption.



Oil and gas companies therefore are working to make better use of data in order to...



### **IMPROVE ASSET** MANAGEMENT

Boost availability, flexibility and reliability of producing facilities

#### **OPTIMIZE OPERATIONS GLOBALLY**

Increase visibility, improve utilization of available expertise, standardize, and realize economies of scale



**IMPROVE EXPLORATION** 

Capture and process data to

performance, and optimize

identify previously inaccessible

AND PRODUCTION

reserves, improve well

production

# The timing is good, as the world is increasingly becoming ...

#### INSTRUMENTED

- Today, there are 1 billion transistors for each person on the planet
- By 2010, 30 billion RFID tags will be deployed

 Condition monitoring systems can improve asset utilization for example, by identifying signs of wear before breakdowns occur

#### INTERCONNECTED

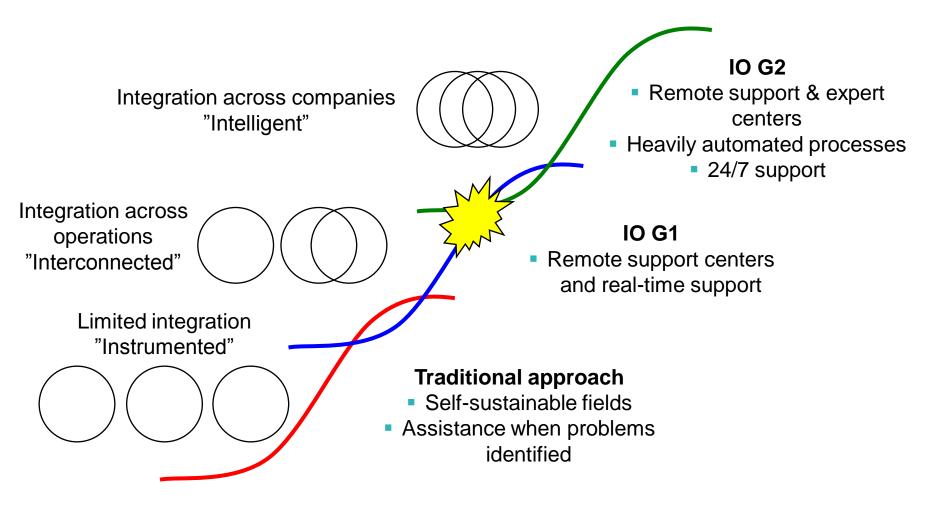
- Almost one third of the world's population will be on the web by 2011
- There are an estimated 4 billion mobile phone subscribers worldwide
- Connecting offshore and onshore support centers for real-time collaboration across the globe speeds decision-making and increases productivity

#### INTELLIGENT

- Every day, 15 petabytes of new information are being generated
- A company with 1,000 employees spends \$5.3 million a year to find information on its servers
- New intelligence transforms the way oil and gas companies operate: increases oil recovery, lowers costs and accelerates production



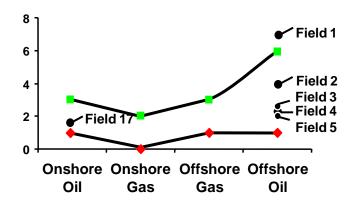
# The emerging operational concept is called Integrated Operations (IO)

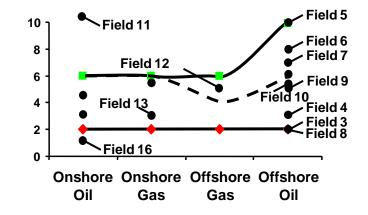


IBM.

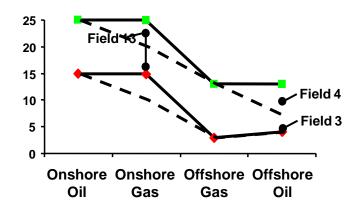
# The effects of IO on the industry's performance have been significant already

Increased Reservoir Recovery (% OOIP) Increased Production Rates (%)



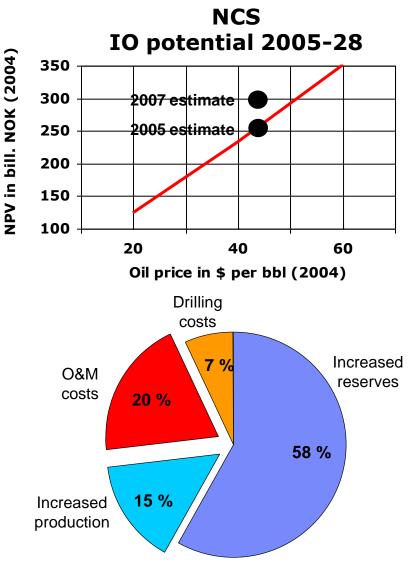


#### Lower Operating Costs (%)



# But there is much more to gain, as illustrated by this example from Norway

- The economical potential of IO on the Norwegian Continental Shelf (NCS) is estimated to 50 bill. USD
- 80-90% of the potential has yet not been realized



# For the full potential to be realized, IO G2 has to be implemented

Excellence in IO requires:

- Detailed knowledge about the state & condition of operations and facilities
- Consolidation of processes as well as IT solutions
- Vertical in addition to horizontal integration of IT solutions

## IO.anytime@anywhere

• Enterprise-wide processes



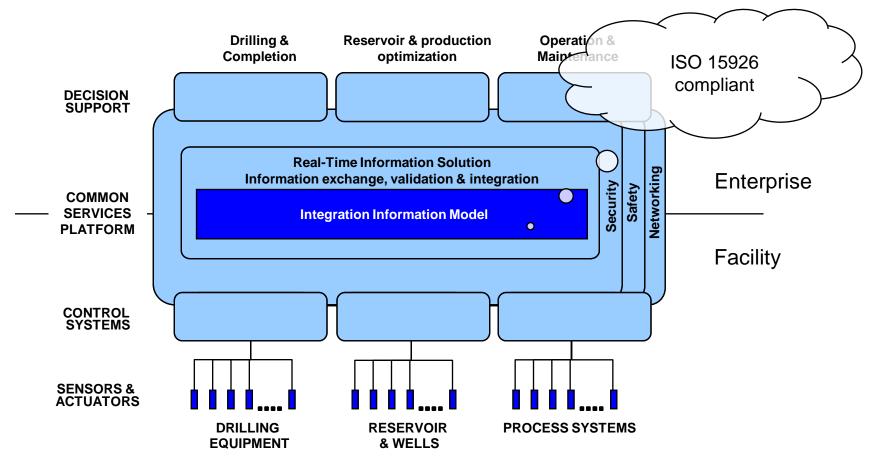
Standardized access to information



 Many different systems: Well management, DCS, asset management, IMS, ...
 Heavily instrumented facilities



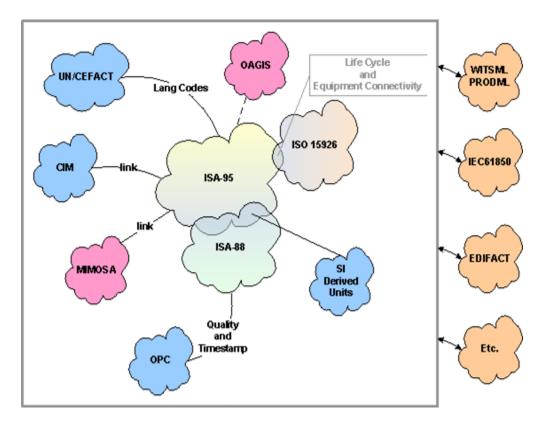
# So has standardized (canonical) information models that span disciplines and domains



Architecture based on Reference Architecture for The Norwegian Oil Industry, Integrated Operations Generation 2



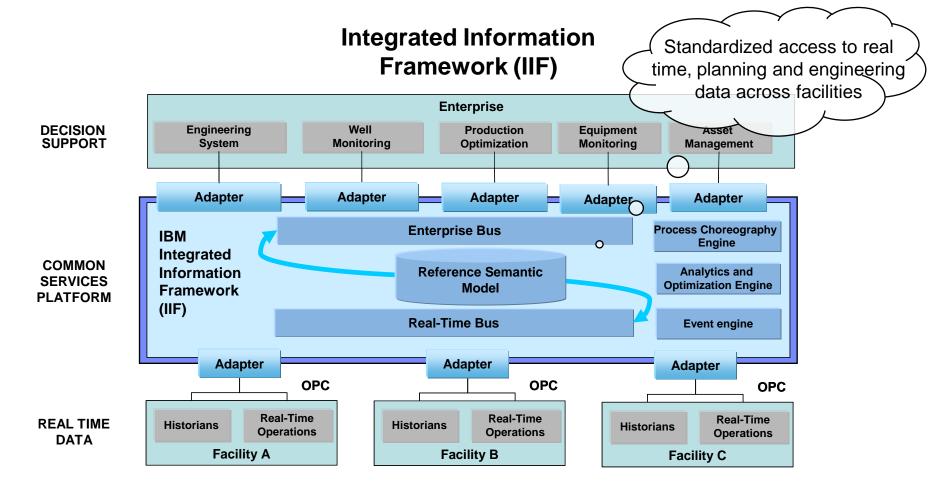
# IBM participated in development of a first version of such an information model



#### **Reference Semantic Model (RSM)**



# IBM also has developed a real time integration solution that is based on this model



# The IIF and the RSM jointly facilitate required interoperability and consolidation

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### **Equipment monitoring**

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#### **Turnaround optimization**

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# IBM will continue its focus on IO and ISO 15926

- Participate actively in extending ISO 15926
  - Extend ISO 15926 into the real-time domain through inclusion of the RSM in ISO 15926
- Demonstrate that ISO 15926 extensions provide the interoperability and scalability required for IO G2 to be implemented
  - In projects such as the IOHN project
  - With partners
- Continue to develop ISO 15926 compliant products
  - Adapt the Integrated Information Framework (IIF) product to future releases of ISO 15926
  - Co-operate with partners



# Extend ISO 15926 into the real-time domains

IOHN assignment: Represent RSM in ISO 15926

# Scoping statement phase 1: Parts of RSM piloted at StatoilHydro

#### Status:

- Classes and relations added to PCA RDL
- RSM model version 2.0 proposed
- Ready for review and standardization through PCA

### Participants first phase

### StatoilHydro

• Requirements

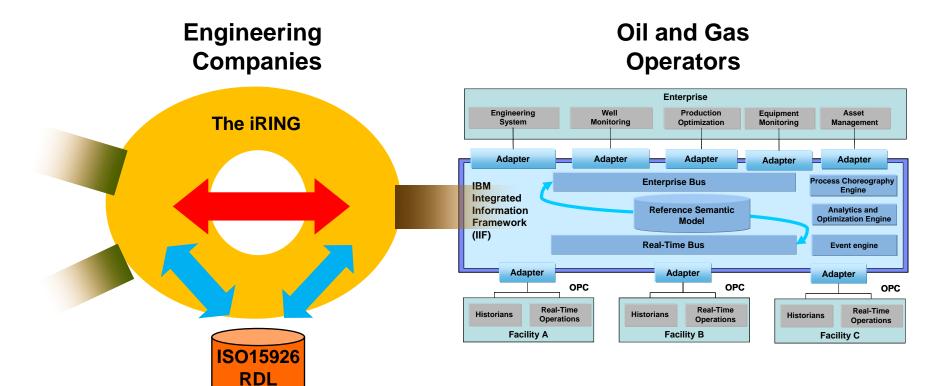
### POSC Caesar Association (PCA)

- Custodian of ISO 15926 RDL
   IBM
- RSM provider
- UML modeling expertise
- Application integration know-how
- Business scenario insight

### DNV

- Vendor independent advisor
- Semantic technology expertise
- ISO 15926 modeling expertise
- Project management
   Epsis
- Semantic technology expertise
   Mimosa
- Domain standards expertise

Demonstrate that extended ISO15926 provides required interoperability



Engineering Company – Operator integration

- Needs shared terminology in Reference Data Libraries (RDL)
- ISO 15926: the semantics of iRING

#### Oil and Gas Enterprise – Facility Integration

- Needs a standardized information model
- ISO 15926 extension Reference Semantic Model (RSM): the basis for IO G2