



Efficient **deepwater**
drilling technologies

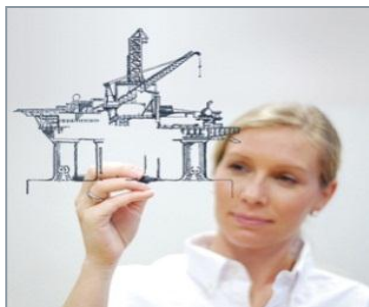


Improving drilling operations efficiency in the Oil & Gas Industry using an architecture approach

Open Group – Business Development by EA, Oslo 11/6-13

Tore Bjerke | Manager eConcept Technology Platform

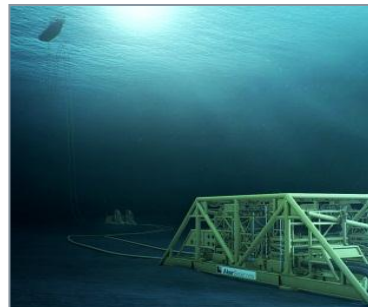
Business areas



Engineering



Drilling technologies



Subsea



Umbilicals



Process systems



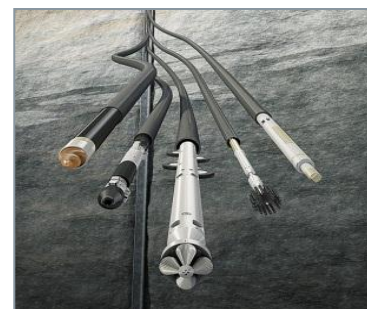
Mooring and loading systems



Maintenance, modifications and operations



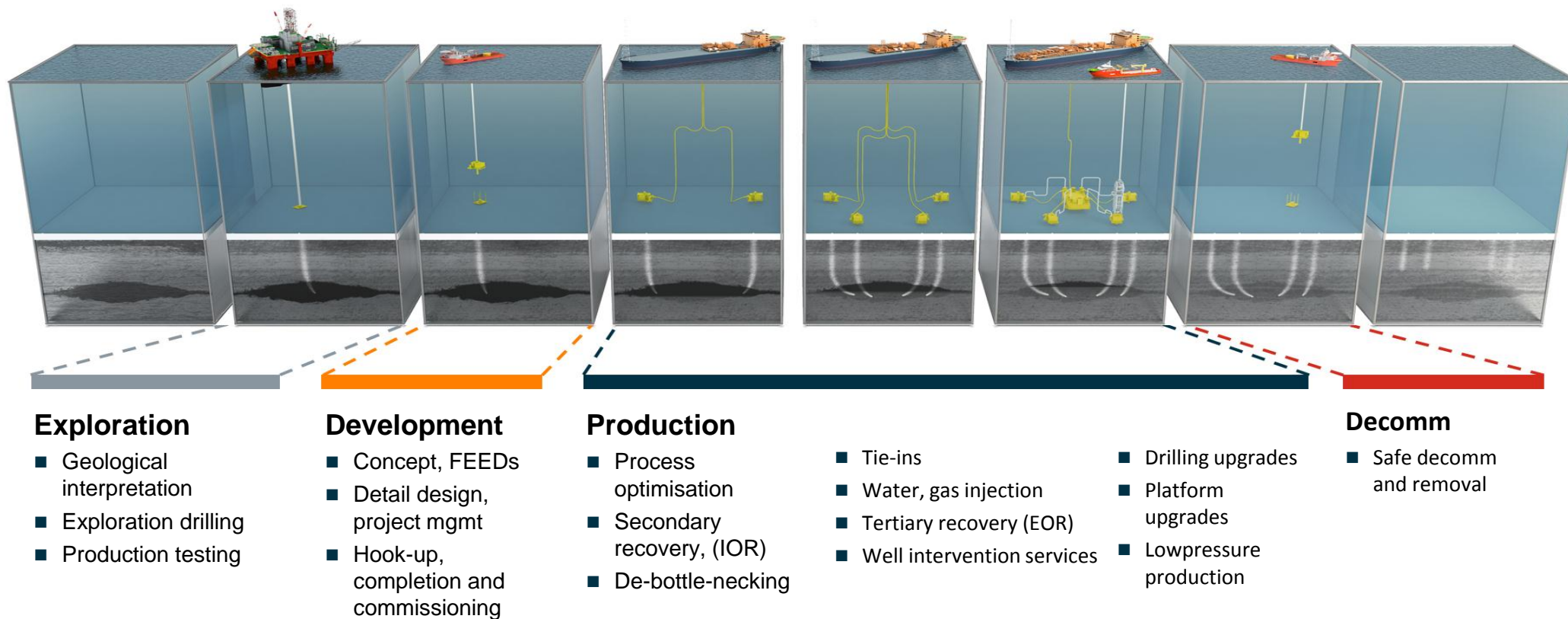
Oilfield services and marine assets



Well intervention services

Through the life of a field

- Our knowledge and technologies span from reservoir to production, and through the life of a field.

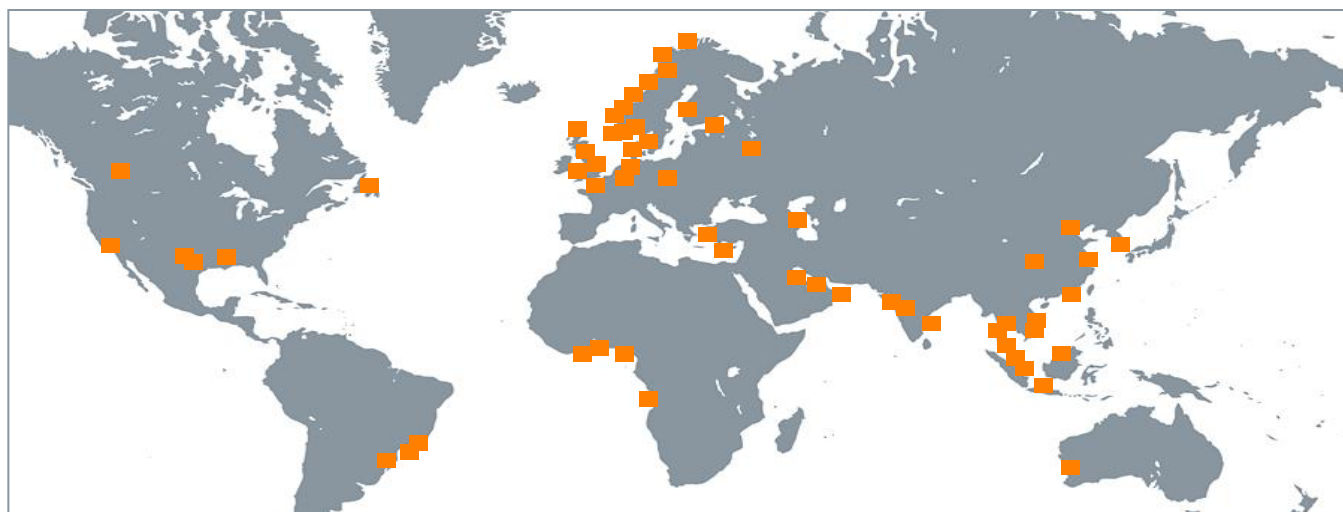


Where we are – a global footprint

Countries: **31**

Locations: **~ 80**

- engineering hubs
- service bases
- manufacturing plants
- sales offices
- project management



Angola

Luanda

Australia

Perth

Azerbaijan

Baku

Brazil

Curitiba
Rio das Ostras
Rio de Janeiro

Brunei

Kuala Belait

Canada

Calgary
St. John's

China

Beijing
Shanghai
Shenzhen
Yichang

Cyprus

Limassol

Denmark

Copenhagen
Esbjerg

Equ. Guinea

Malabo

Finland

Helsinki
Ulvila

France

Paris

Germany

Bad Fallingb.ostel
Erkelenz

Ghana

Takoradi

India

Kakinada
Mumbai
Pune

Indonesia

Batam
Jakarta

Ivory Coast

Abidjan

Malaysia

Kuala Lumpur
Labuan
Pekan
Port Klang

Nigeria

Lagos
Port Harcourt

Norway

Asker
Arendal
Bergen
Egersund
Fornebu
Hammerfest
Horten
Kristiansand S
Kristiansund N
Lyngdal
Midsund
Moss
Narvik
Oslo
Porsgrunn
Sandnessjøen
Stavanger

Norway [cont.]

Stokke
Stord
Tranby
Tromsø
Trondheim
Ågotnes
Ålesund

Oman

Muscat

Russia

Moscow
St Petersburg

Saudi Arabia

Al-Khobar

Singapore

Singapore

South Korea

Geoje
Pusan

Sweden

Gothenburg

Thailand

Bangkok
Sattahip
Songkhla

UAE

Abu Dhabi
Dubai

UK

Aberdeen
Great Yarmouth
Hastings
London
Maidenhead
Stockton-on-Tees
Whitstable

USA

Bakersfield
Houston
Katy
Lafayette
Mobile

Vietnam

Vung Tau
Ho Chi Minh City

Drilling Technologies - organization

- Delivers top side equipment
- Consists of 8 production units
(Kristiansand, Asker, Horten, Fornebu, Erkelenz, Houston, Brazil & MPO)
 - Develops equipment and produce equipment
 - Holds the employees for Drilling Lifecycle Services (DLS)
 - The largest PU is Kristiansand
- Global units:
 - Business development
 - Drilling Solutions
 - Runs all projects for new builds
 - Global DLS
 - Responsible for process and services from commissioning to decommissioning
 - Main stakeholder for eConcept



The challenge

- Exploration at deeper water
- Harsher environment
- Increased demands on efficiency and security
- Demand of increased operational stability – up-time
- Operational cost for a rig is high
- Move from calendar based to condition based maintenance
- Move from calendar based to continuous classing
- Crew development



DLS - Strong offering of both traditional and new services

Traditional

Spare parts



- 24/7 spare part supply is for rigs in operation
- Global presence
- Stocks available globally
- Recommended operational/critical spare parts

Service



- Technical and operational rig support
- Global presence
- Remote diagnostics

Overhaul / Installation/ Modification



- Overhaul and recertification
- Upgrades and modifications
- Exchange component stock

Training



- World-wide training for operators and maintenance personnel
- eLearning and class room training
- Single equipment simulator
- 3D simulator drilling systems (DES)
- On-board training

eConcepts



- Global 24 hour gateway
- Fast and cost efficient troubleshooting on core drilling equipment
- Real time diagnostics and support
- Continuous rig improvement

Simulation services



- Installation simulation
- Drilling process optimization
- Design process

Condition Based Maintenance



- Real time condition monitoring of critical rig equipment
- Preventive maintenance management

Lifecycle Engineering



- Capacity to execute upgrades & modification
- Visioneering reducing commissioning time
- Internal and external engineering support
- Cover all products and disciplines



myDrilling™ and Riglogger™

Aker Solutions develops two new tools to help implement the strategy

myDrilling™

Welcome: Tore Bjerke Aker Solutions

AkerSolutions™

Filter by Rig: Your Rig × All products Equipment No time limit What are you looking for?

Current filter

Your Rig ×

Overview

Bulletins

Orders

Requests

Documentation

Home | Your Rig

Your Rig

Remote connection



19

Average trip in
per session

25

Average trip out
per session

11

Orders
in progress

11

Bulletins
unimplemented

34

Requests
open
 Owner:
Type:
Sector:

Rig Owner

Semisubmersible
Europe – North Sea UK

Aker Solutions office: Great Britain

Report rig move

Your Rig

- » Bop Handling Equipment
- » Bulk Storage And Transport
- » Compensator And Tensioners/Dat
- » Control Rooms And Cabins
- » Dcms
- » Derrick Structure
- » Drillfloor Equipment
- » Drilling Risers
- » High Pressure Manifolds And Well Control
- » Hoisting System Ramrig
- » Misc
- » Mud Circulation And Transfer
- » Mud Mixing
- » Mud Pumps
- » Personnel Lifting
- » Pipe Handling Equipment/Drillfloor
- » Pipe Handling Equipment/Htv
- » Pipe Handling Equipment/Vph
- » Ramrig Hpu
- » Ringline Hpu
- » Riser Handling
- » Solids Control
- » Top Drives
- » Utility Equipment
- » X-Mas Handling Equipment



10 latest activities

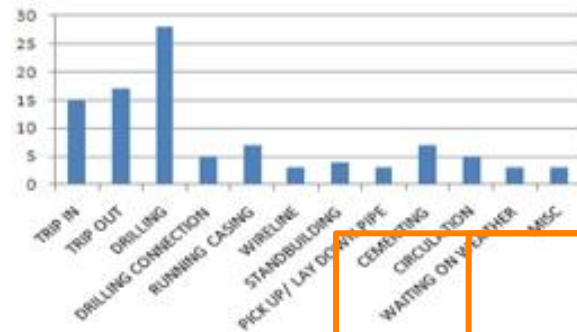
Type	What is new?	Time
Request	Editing involved people New comment: Passed to MyDrilling Team... By: Robertson, George	2 minutes ago
Request	Edit Request New comment: Passed to MyDrilling Team... By: Robertson, George	6 minutes ago
Request	B 732 TS HRN - Loss of HRN and	7 minutes ago

myDrilling

RealTime
Data from Your rig - powered by Riglogger™

AkerSolutions™

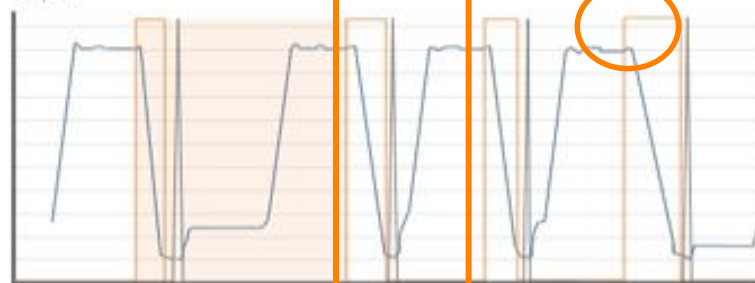
Filter by: Your rig | All products | Equipment | Past 30 minutes | 23 Mar 2012 12:44:21

Overview
Performance
Condition monitoring
Report
Recommendations

Trip sequence

Deviations highlighted
Investigate details

Trip in



Number one sequence

2:54

80%
within ideal time

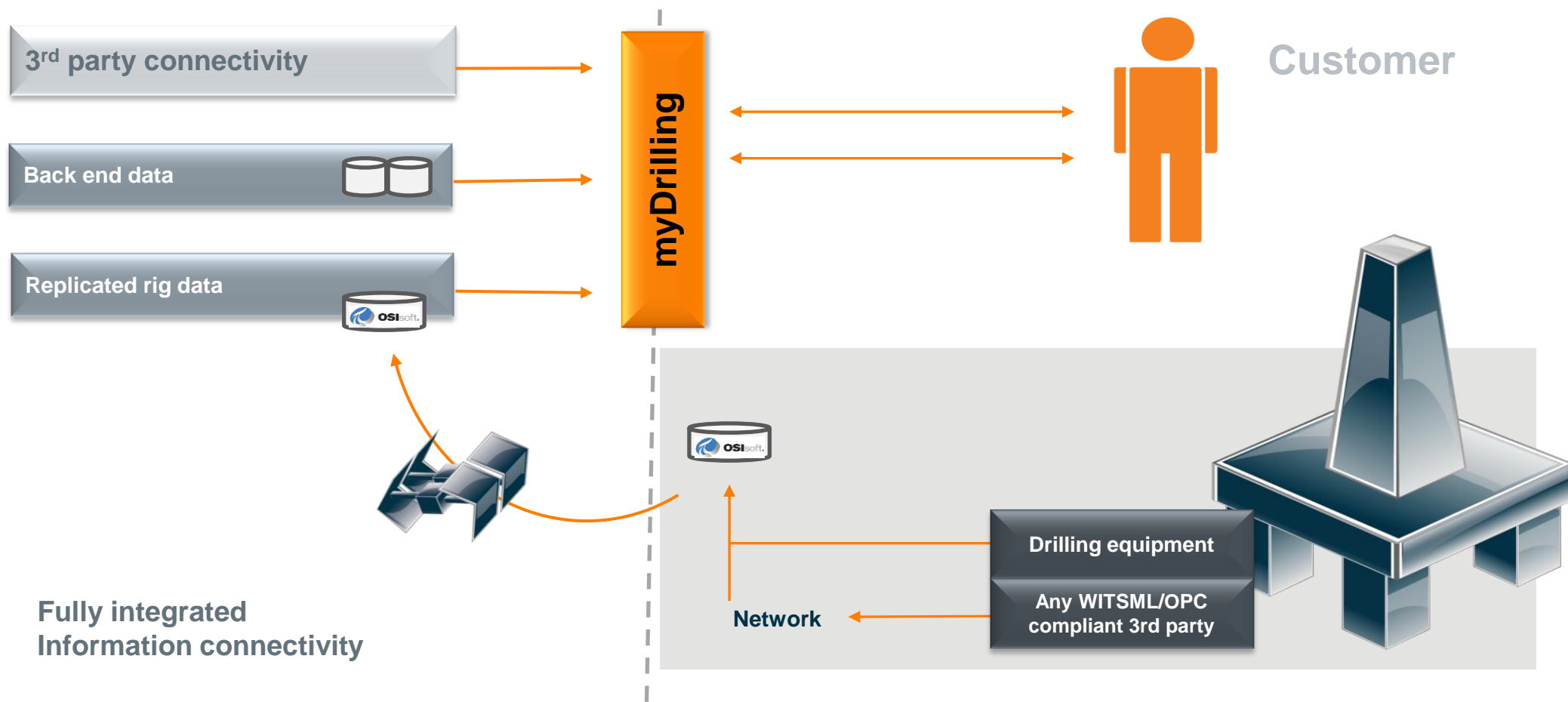
Average sequence

3:39

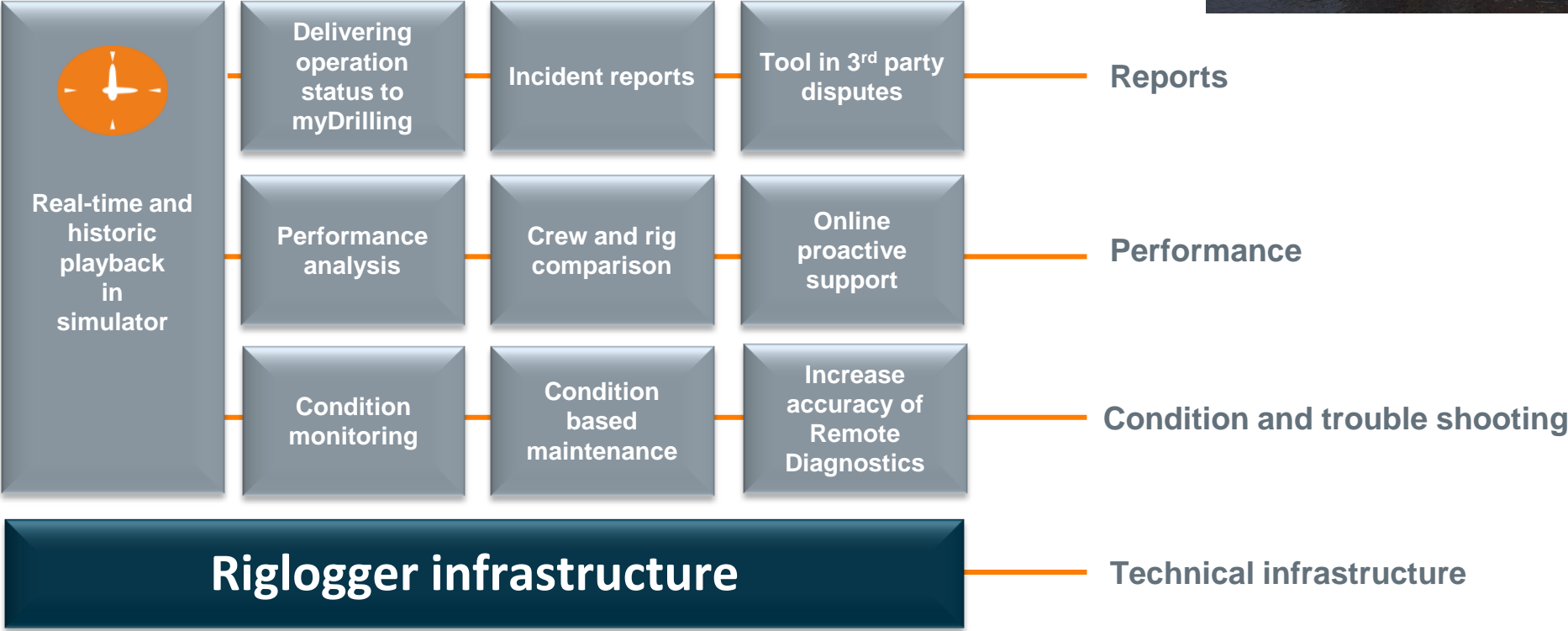
Trip in 14:51:15 to 14:56:35 (Duration: 5:20, Estimated: 3:32)

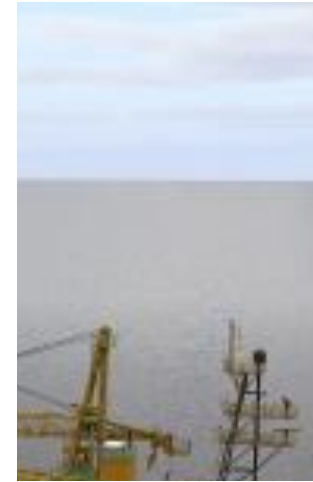


Technical overview



Riglogger services



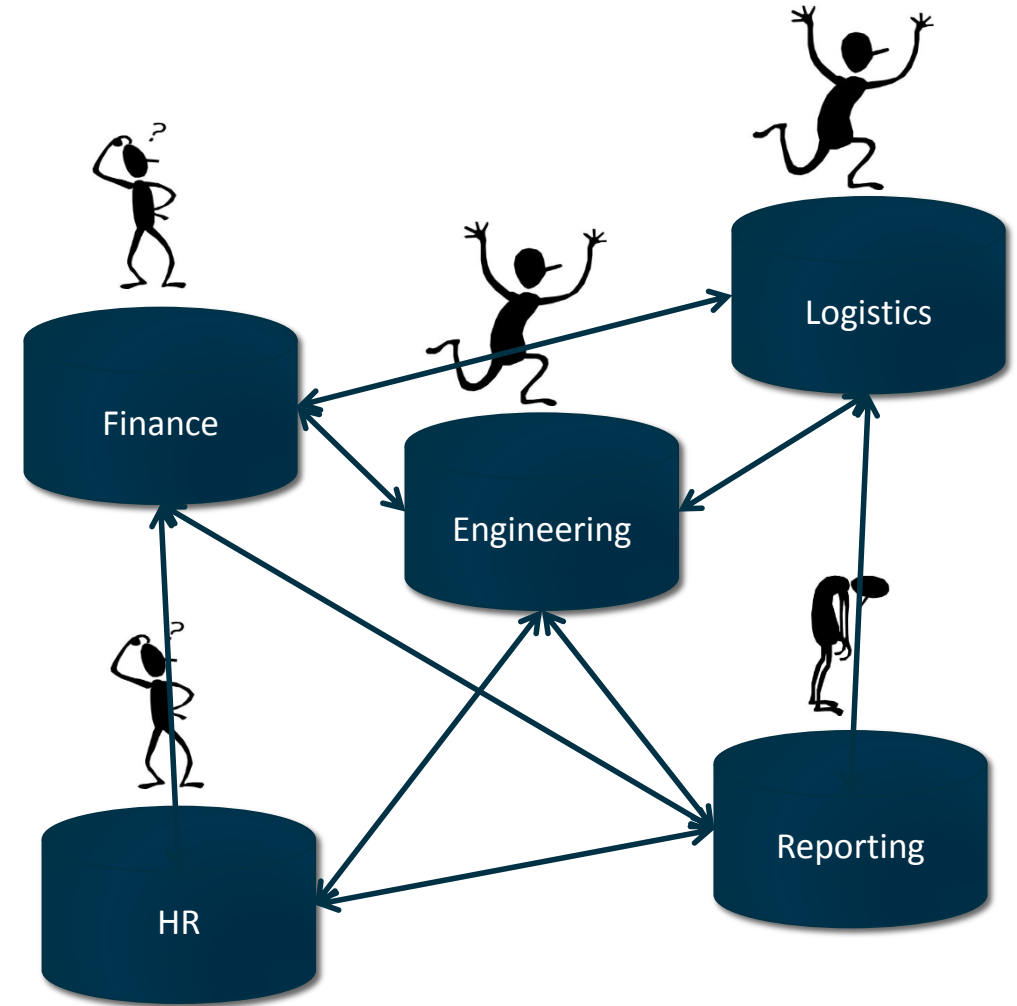


Enterprise Architecture

Why was it important to focus on Enterprise Architecture in the development of myDrilling™ and Riglogger™?

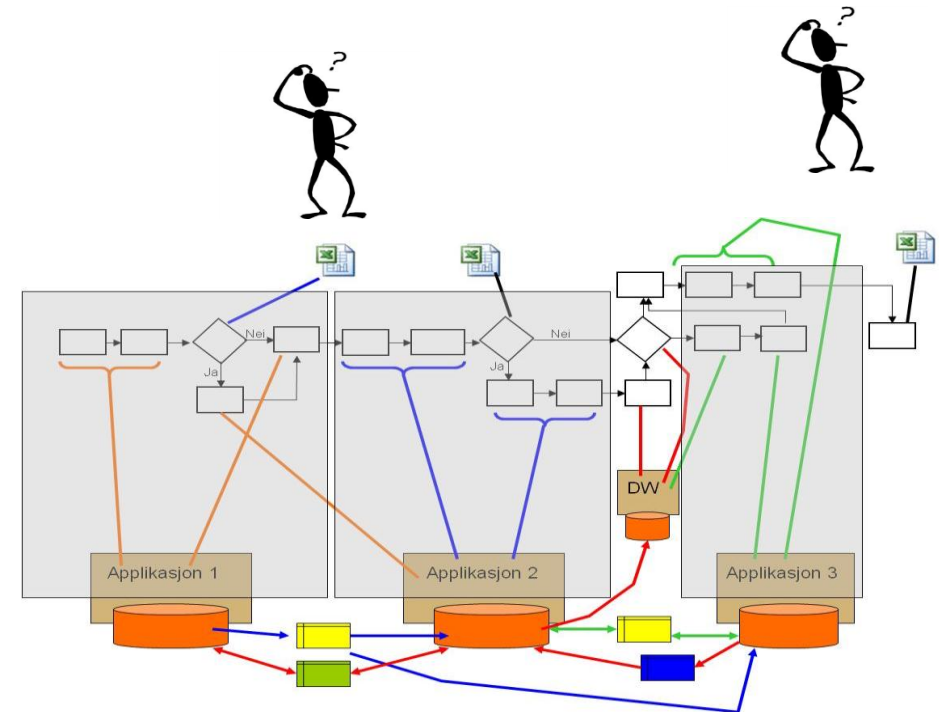
Classical development strategy

- Specification and development within separate domains – Silos
- Primarily focus on Functionality
- Heavy IT dominance and IT driven
- Local isolated information models
- Missing Business ownership
- Ad hoc integration
- Relational understanding across domains lacking
- *Still a significant development strategy in some companies*



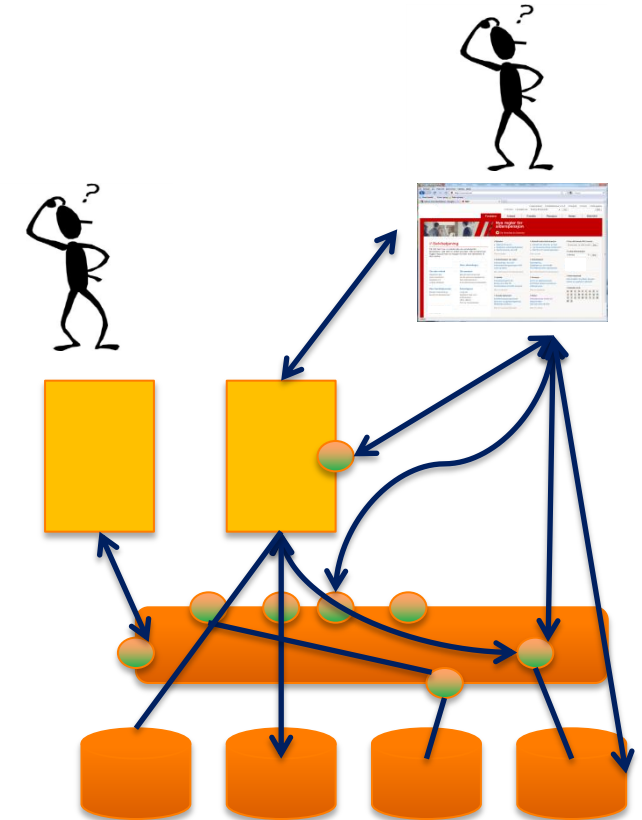
The challenges continued in the 90's

- Increasing focus on Process
 - Crossing the Silos
 - Do we understand process?
- We start with EAI (the more advanced)
 - But forget Semantics and Taxonomy
- Mergers and acquisitions increases complexity
- At the end of this are we see a trend towards isolated “light weight” applications again to meet “time to market” demands.
- Still IT driven, emerging business ownership.



200n gives us Service Oriented Architecture

- That will solve everything ... right?
- The challenges are piling up:
 - Technically driven
 - Services not written for process
 - Functions or CRUD oriented
 - Missing infrastructure (ESB)
 - Security?
 - Re-use?
 - Governance?
 - Information aspect?
 - Process understanding?
- Overarching architecture?



Why did we choose EA in myDrilling™ and Riglogger™?

- The challenge:
 - Build a solution that's scalable as well as flexible correctly reflecting the business
 - Build a solution that easily adapts to new business requirements
 - Make it easy to implement new services quickly
 - Focus on "Time to market"
 - High level of security – data needs to be trusted
 - Be "Lean and mean"!
- Previous architectural patterns is often rigid or too complex and difficult to extend
- What is the main stable architectural component in an organization?
 - Organization?
 - Systems or domains?
 - Functions?
 - Process?

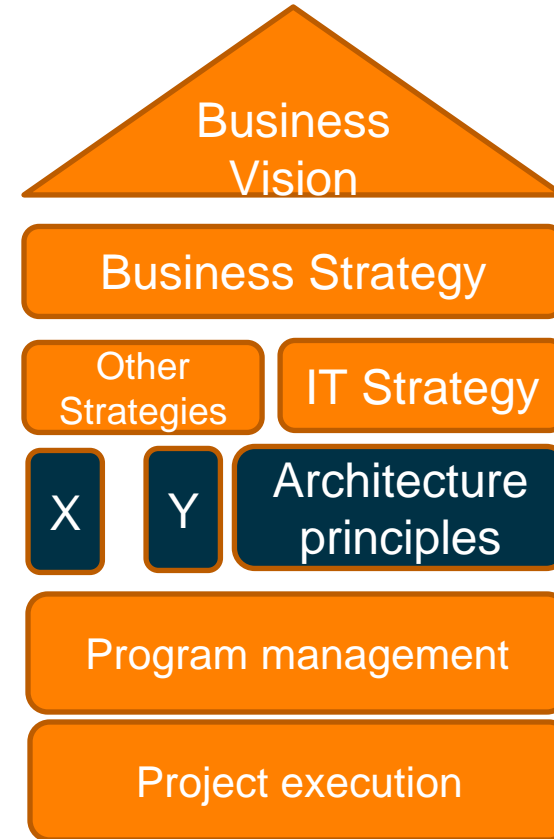


- How to succeed with an Enterprise Architecture

Enterprise Architecture

Architecture founded on the business strategy

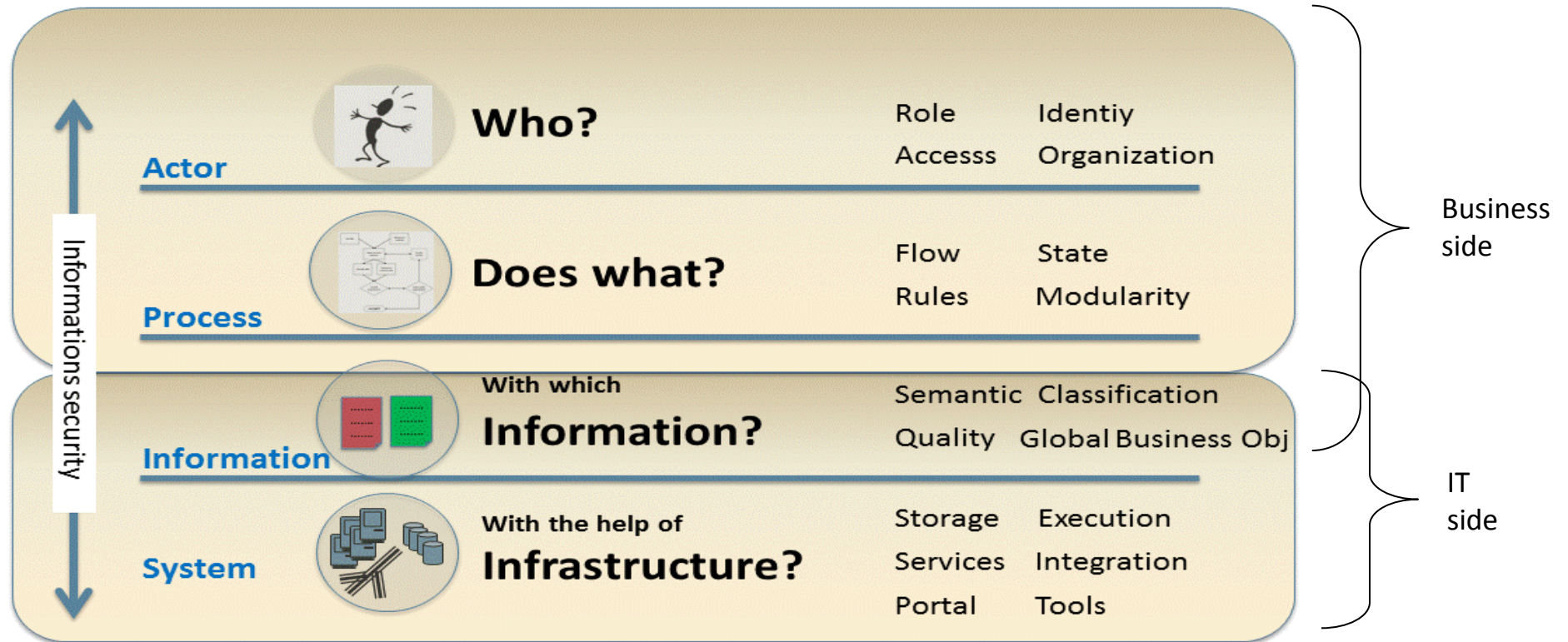
- It's important to anchor the architecture in the overarching strategy
- IT is only a tool for the business to execute the strategy to achieve the business goals in the most optimal way
- The Architecture needs to reflect the business strategy and is one of the more important components in unlocking effective use of IT



Simplified view



Architectural Aspects – turning complex reality into understandable concepts

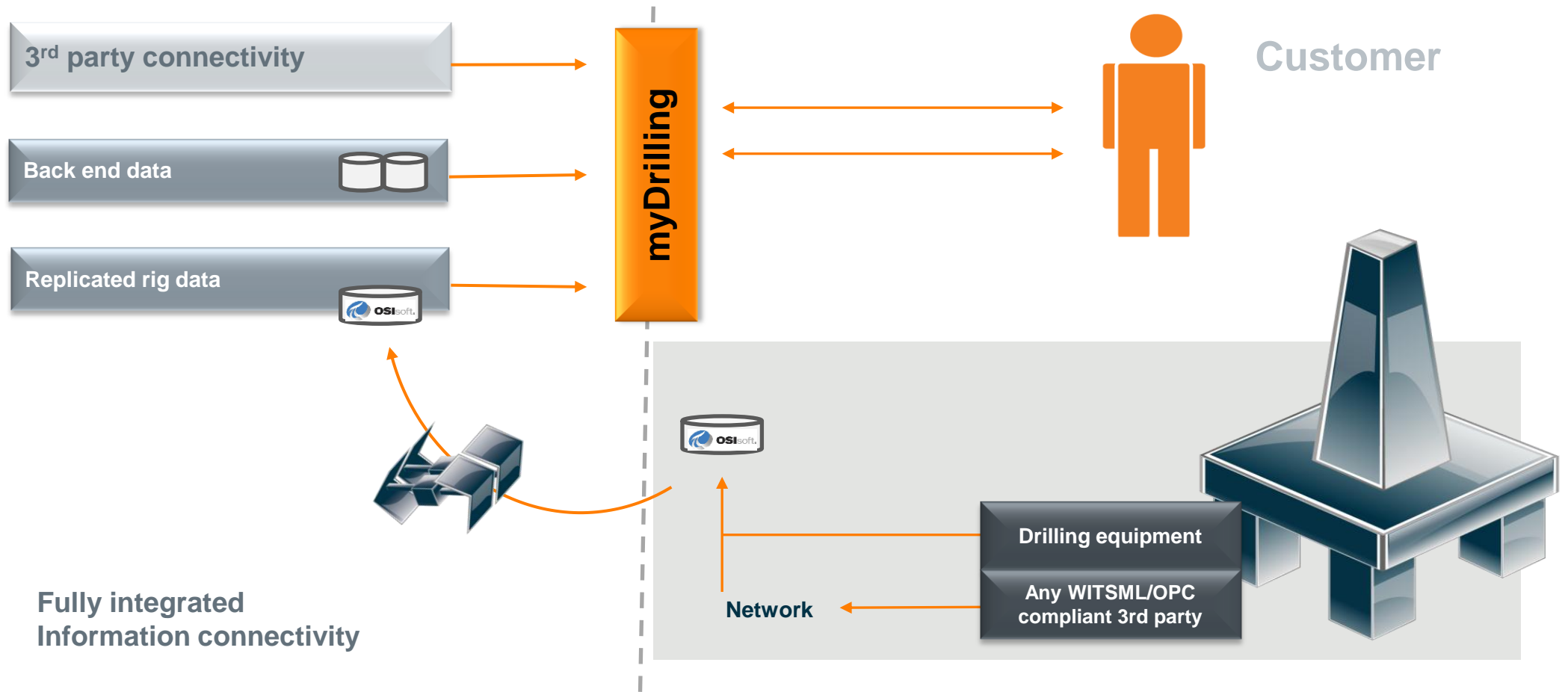


eConcept has stated 52 architectural principles

Key roles in an Enterprise Architecture

- Process architect
 - Responsible for verifying business processes
 - Responsible for process architecture (levels, notation, identification, state etc.)
 - Defines the process abstractions
 - Ensure business ownership
- Information architect
 - Responsible for abstract information model
 - Model Global Business Objects (GBO)
 - Responsible for state and state changes
 - Responsible for quality encapsulation
 - Responsible for GBO life cycle modelling
 - Responsible for explicit context handling
 - Ensure business ownership
- Lead architect
 - Responsible for overall architecture
 - Coordinate architects

Riglogger™ and myDrilling™ revisited



Summary – Q&A

myDrilling™ and Riglogger™
gives you the right information
at the right time enabling better
decisions!



Thank You!

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