‘Adding Value from Digital Oilfield’

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Introduction

• Insights and Lessons learned into adding value from Digital Oilfield over the last ten years in major Oil and Gas companies

• Concentrate on some Key themes
  • What is Digital Oilfield (DOF)
  • Drivers and Enablers and why we do DOF
  • The evolution of thinking on how we do this
  • Collaboration – Key lessons
  • The role of Leadership and Management
  • What is Next for DOF
  • Changing the way we do business
i-Field, Digital Oilfield, Smart Fields, Integrated Operations ..what does it all mean?
“Integrated Operations is a revolution that is reshaping our industry”
  - Helge Lund – StatoilHydro

“All new fields will be intelligent fields”
  - Amin Nasser – Saudi Aramco

“I expect the use of Smart Technology to accelerate over the next decade”
  - Malcolm Brinded – Shell

“Our Operations Centre in Aberdeen monitors 28 rigs simultaneously”
  - Andrew Gould – Schlumberger

“We have gained 85 mboed of production at $3-6 per boe” - “We expect another 100 mboed by 2017”
  - Dave Latin – BP
Digital Oilfield – What is it?

- Umbilical and Flowline Monitoring
- Surveillance and Control of Subsea Production Systems
- Real-time Data
- Production optimization
- Flow Assurance Analysis
- Condition monitoring
- Remote Operations & Remote Operations Management
- Virtual Collaboration
- eLearning
- Knowledge Management
- Visualization
- IWIS
- Remote Operations & Management Knowledge
- eLearning Remote Operations & Management
‘The vision for the Digital Oil Field is one where operators, partners, and service companies seek to take advantage of improved data and knowledge management, enhanced analytical tools, real-time systems, and more efficient business processes’

What is enabled by an DOF?

• Moving to a real time or near real time way of working
• Connection of one or more remote sites or teams to work together
• Moving to more multidiscipline way or working
Drivers

- Discoveries in increasingly remote locations
- Key skill shortages
- Increasing technical nature of new discoveries
- Performance Improvement
  - Production efficiency
  - Reservoir recovery
  - Operational cost base
  - Drilling performance
- High or Low Oil Price?

Enablers

- High bandwidth communication
- Large storage capacity
- Quality video conferencing
- New sensor technologies
- New Analytical Methods
- New Business Processes
- New SCM Models
- New Operational Models
- New Organisational Models
Value Realised

• Production Optimisation - Typically it is 0.5-2%
  • Can be much higher
• Reservoir Optimisation – Industry Standard 0.5 – 2.0%
• Operations and Maintenance
  • Opex Cost Reduction 5-15% Industry Standard figures
• Drilling and Well Planning
  • Reduction in NPT – 5-15% reduction in total well time
  • Concurrent Planning – Well planned < 2 weeks
• HSE - 25% Reduction in offshore staff by Statoil
Evolution of DOF – Learning’s

- Vision of a new way of working
- Focus on Pilots and Technology not adding business value
- Leadership at local level is important
- DOF implementation is more than technology and rooms
- Value gained if successful, is significant
- ‘If we build it they will come’ approach did not work
- Solutions were not easily scalable
Evolution of DOF – Learning’s

- Process and people change management are critical
- People are at the centre of iE implementations
- In DOF ‘one size does not fit all’
- Standardisation versus Diversity on the ground
The focus is on outcomes i.e., Value delivery and not inputs.

Organisational Change and Governance is key.

The capability framework is a key element for scaling of DOF.

A Capability approach ensures that all aspects of successful implementation are covered.
Evolution of DOF – Learning’s

- Framework to implement multiple interlinked capabilities
- Relationship supplier/customers will change.
- Will lead to New organisational models
- A capability platform will apply DOF to the entire company
- Implementation needs to be owned by the top management as it is truly transformational
The measurement to decision lifecycle

- Measure Data
- Transmit
- Store
- Obtain Value
- Analyse
- Implement Decision

Building Trust

Building Confidence

Building Understanding

Improving Operational Excellence
Business Capability Stack

Value

Real Time Production Optimisation

Outcome/Effect

Action/Implementation

Decision Support/Performance Management

Organisation/Governance

Collaboration

Knowledge Sharing and Peer Working

Visualisation and Reporting Layer

Process Workflow

Integrated Modelling and Simulation

Application and Model layer

Data integration layer

Database Layer

Comms/Network Infrastructure and Standards

DCS/SCADA or Equivalent

Sensor Layer

Business Value

Technical data

Processes

KPI Dashboards - OPS

Technical applications

Reservoir

Production

Drilling

Geology

Other DBs
Technologies that are driving change

- Sensor Technologies
- WiFi Technologies
- Modelling Technologies
- Predictive Analytics
- VC and Collaborative Technologies
- Availability of High Bandwidth communications
- Web 2.0 and Social Networking
Collaboration is Key to Digital Oilfield
Collaboration Enables

- Real time geographically distributed work
- Integration of the multiple disciplines supporting a single value adding process
- Shared situational awareness
  - Shared mental model
  - Shared real time data and information
  - Trust & Leadership
- Self synchronization versus Planning and Coordination
- Effective collaboration is key to delivering DOF
Collaboration – Vision of a new way of working
Leadership and Management

• Clarity of vision and Communication
• Align the Organisation
  • Assets and Centre
  • Functions
  • Internal and External
• The ability to allow everyone to ‘earn and learn and lead’
• Absolute integrity and honesty
• Proactive Participation in DOF implementation
Challenges – DOF is an Integration Project

- How do we integrate across:
  - Technologies – Data and information
  - People, Process, Technology, Organisation & Physical Environment
  - Geographically remote Locations
  - Disciplines and Functions
  - With and without the company
  - Value Chain, reservoir to customer

- This needs to be broken down into manageable chunks

- An Organisation needs to understand where its primary value opportunities are from the above
What’s Next for Digital Oilfield?

- Extending beyond frontline Production, Operations and Drilling and the Inclusion of a broader range of disciplines
- Major projects
  - Inclusion of DOF in the Design of New Fields
  - DOF Applied to the Major Projects Process
- Asset Integrity
- Real Time Environmental Monitoring
- DOF across the entire Value Chain – A move into Mid and Downstream
- Learning from other sectors such as Defence, Aeronautical, Automotive
- A change in the Oil Company Supplier Relationship – ‘Eco-System of Companies
Changing the way we do business

- There is very significant Value in DOF
- It is about Distributed Real Time Working
- Sustainability and Scalability is still a challenge
- DOF is highly dependent on the organisation & culture of your business
- DOF Phase 1 enabled by Technology and New Processes
- DOF Phase 2 Enabled by new Operational, Organisational, SCM Models
- DOF is fundamentally changing the way we do business in Oil and Gas
- We have only just begun the DOF journey
- It is How we will run our companies in the future
Thank you
Questions?