Going with Data

Strengthening of Role: Data Regulator to Data Shaper

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Key Questions

1. Is my required data available?
2. If available, is it of the right quality?
3. If it is of the right quality, is it coming from the right source?
Technical Data Management – Reality Check

1: Base
- **Process**: None defined
- **Tech**: No specific tools
- **Quality**: Low, depends on individual
- **Value**: Subjective

2: Managed
- **Process**: Silos, some non-standard
- **Tech**: Unintegrated point solutions
- **Quality**: Variable, difficult to measure
- **Value**: Anecdotal

3: Corporate Competency
- **Process**: Standard, consistent, measurable
- **Tech**: Integrated, enabling process best practice, self service
- **Quality**: Almost complete certainty
- **Value**: Minimized Risk & Optimized Value

4: Predictable Risk
- **Process**: Statistically stable
- **Tech**: Automation, Decision Support
- **Quality**: Improved reliability and predictability
- **Value**: Risk-Reward Balance

5: Fully Optimized
- **Process**: Entirely automated
- **Tech**: Expert systems
- **Quality**: Almost complete certainty
- **Value**: Measurable

Current position

Target for 2-3 years

Ultimate Target

Source: D’Angelo, J & Troy, B 2000, Oil & Gas Journal, Jul.

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**TD Management Framework**

Covers the management of information lifecycle activities; acquire, create, QC, store, publish, manipulate, archive, discard, secure.

Covers all technical applications for each domain areas. Includes suites of applications and databases.

Covers data management workflows throughout the data management lifecycle.

Related to work instructions, best practices, general documentation on Seismic, Well, Reservoir, Interpretation, GIS data covering all technical data types.

Focuses on the different data depositories used to store both corporate and project data.
Previous industry studies: Geologists spend up to 60% of their time looking for & quality checking data for their projects.

Recent PETRONAS study: Geologists spend 39 days looking for & quality checking basic data (well header, checkshots, deviation and well logs) for their projects. This is an estimated 20% of their time.

To realise the opportunities
What components need to be in place?

**Step 1**
Cost management
Reduce the 39 days to 5 mins for the 4 data types.

**Step 2**
Process improvement
Standards & workflows
Bring to acceptable quality
Capture work done for re-use

**Step 3**
Optimization
‘One version of truth’ datasets
Re-use many times
Crafting the Elements – The Journey
People & Skills

• Finding the right talent
  • Hybrid skillsets of Technical EP and IT
  • Right mindset and interest

• Defining a home for Technical Data
  • Setting up of a Skillgroup

• Developing the people
  • Training program, competency framework and career options
Processes

• Right Structure
  • *Functional Excellence*
  • *Delivery Discipline*

• Governance
  • *Project Management Office (PMO)*
  • *Technical Data Review Committee (TDRC)*
  • *Data Quality Metrics Dashboards*
  • *Standards and compliance*
Technology

• Data Architecture
  • Technical data architecture
  • Integration architecture

• Application Portfolio Management
  • Application Maps
Data - Distinguish the main roles of data stores and ensure all roles are sufficiently in place - Aim for moving more data scope into managed data stores

- Gradually expand data footprints for better coverage of the EP value chain - Ensure full adoption of the 10 data management principles which focus for data ownership in the business

- Technical data managed as an asset - Asset Integrity - Facilitates cross discipline teamwork and audit trail for decisions
Application Maps

- Application Maps provide an overview of standard technical applications used in PETRONAS EP
- The maps are colour-coded, using the agreed Software Application & Database Portfolio Management Taxonomy
- TD is currently the custodian of the following 8 application maps:

1. Petrophysics
2. Reservoir Engineering
3. Production Technology
4. Well Engineering
5. Facilities Engineering
6. Process & Operations
7. Geospatial
8. Geology & Geophysics
Application Maps

Example: Geoscience – Geology and Geophysics
Financials

• Investing to create value
  • Technical Data Excellence – Value Register

• Optimisation
  • Technical Applications & Data Repository Optimisation (TADRO)
Going Green with Data (GGD):
The Role of Technical Data Management in Value Creation

Previous industry studies: Geologists spend up to 60% of their time looking for & quality checking data for their projects.

Recent PETRONAS (PEX) study: Geologists spend 39 days looking for & quality checking basic data (well header, checkshots, deviation and well logs) for their projects. This is an estimated 32 man years/year.

To realise the opportunities
What components need to be in place?

Step 1
Cost management
Reduce the 39 days to 5 mins for the 4 data types.

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Standards & workflows
Bring to acceptable quality
Capture work done for re-use

Step 3
Optimization
‘One version of truth’ datasets
Re-use many times
Select/Key GGD Initiatives

Common GGD Initiatives:

- **Corporate Data Stores**
  Database to store “official” and “quality-approved” data within a governance boundary

- **Technical Data Standards**
  Converging the differences in data standards

- **Data Quality Metrics and Governance Dashboards**
  Improving All-Round Data Quality to reduce Decision-Making Cycle Time

- **Technical Applications and Data Repository Optimisation**
  Optimising Usage of EP Technical Applications

Business-specific GGD Initiatives:

- **GIS Beyond Exploration**
  Improving Asset Integrity through Visualization

- **Malaysian Bathymetry and Site Survey Data Repository**
  Mitigating Geohazard Risks for safer Offshore Operations
Corporate Data Store (CDS)

Database to store “official” and “quality-approved” data within a governance boundary

- Corporate Data Base Application Stack
  - WELL DATA
  - PETROPHYSICAL DATA
  - SEISMIC DATA
  - SEISMIC INTERPRETATION
  - SPATIAL DATA
  - PRODUCTION DATA
  - WELL COMPLETION DATA
  - COMPANY & CONCESSION DATA
  - FLUID PROPERTIES DATA
  - RESERVOIR ENGINEERING DATA
  - RESERVOIR MODEL
  - SURFACE ENGINEERING DATA

- Source
  - WMDB
  - EDM
  - UDRS
  - Petrel Studio
  - RECALL OFDB

- Target
  - WellView
  - EDM
  - IWIT
  - Energy Component
  - Petrel Studio

Final, checked and official data. Managed in one place and delivered to where needed.
Technical Data Standards
Converging the differences

High Level Roadmap

2013
- What we have
- What we need
- What are the gaps?
- Develop approach & process

Deliverables:
1) Inventory
2) Standards workshop
3) Priority list
4) Agreed process

2014
- Working groups set up
- Top 4 data standards
- Develop industry collaboration proposal
- Identify next priority items
- Implementation plan for 1 standard
- Identify value

Deliverables:
1) 4 standards agreed
2) Standards workshop
3) Priority list
4) Implementation plan
5) JIP proposal
6) 1st quantified value

2015
- Implement & test identified standard
- Track value
- Industry collaboration kick off meeting
- Next 4 standards
- Develop longer term standards plan

Deliverables:
1) 1 standard implemented
2) Learnings report
3) Value tracking ongoing
4) JIP kick off meeting
5) Priority list
6) Longer term plan

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Data Quality Metrics (DQM)
Improving All-Round Data Quality to reduce Decision-Making Cycle Time

ACCOUNTABILITY
Custodians / Principals
DDOs – Data Definition Owners

ACCOUNTABILITY
Business Asset Owners or
DSOs – Data Set Owners

The Enterprise Data Quality Dashboard

The to-be situation

ACCOUNTABILITY

Custodians / Principals
DDOs – Data Definition Owners

TZ/Checkshots

Formation Tops

Position Logs

Deviation Data

Seismic

Horizons

Well headers

Problem areas identified, allowing teams or governance body to mobilize corrective actions as appropriate

Our EP databases (Oracle & SQL Server)

Wells
Projects
Logs

141485.0
1059.0
99.3
Trends: Monthly, Weekly, Daily

141485.0
1059.0
99.3

Total records polled
Total errors found
Quality percent
TADRO
Upstream Technical Application Portfolio and Cost Landscape

Key Projects

User Growth: ~10% p.a.

Savings from license optimization (centralized license pool)

Additional savings from contract merging and renegotiation

FY2014
FY2015
GIS Beyond Exploration – Asset Integrity

Improving Asset Integrity through Visualisation

**Asset Integrity Monitoring**
- Monitoring of equipment status on offshore platform (from PI System) on map view via PiriGIS
- **Pilot Completed** for Erb West (Mar ’13)
- Roll out - pending PI readiness field & priority: Next target are Dulang & Angsi

**Well Integrity Monitoring**
- Monitoring of well integrity (from eWIMS) on map view via PiriGIS
- Integration work is in progress
- Full eWIMS Roll out with PiriGIS integration - Q1/2014

**Key Projects**
- Improving Asset Integrity through Visualisation

*Integration with PiriGIS allows wider accessibility of eWIMS for monitoring & intervention purposes*
Malaysian Bathymetry and Site Survey Data Repository

Mitigating Geohazard Risks for Safer Offshore Operation

Background

• Drilling through geo-hazards like over-pressured zones - could result in significant risk

• The mitigation and prevention are paramount, through improved understanding of geo-hazards, their preconditions, causes and implications.

• Bathymetry and site survey are among basic data which are important for the geo-hazard assessment.

Business Driver

2. Limited data coverage – available only within current areas of operation, i.e. within the vicinity of pipeline routes and offshore structures
3. Available datasets are incomplete (site survey)
4. Current business practice is ignoring the past data since new data will always be acquired, past data not well managed
Concluding Remarks

• Driving the **quality of data** to acceptable levels is a key strategic initiative.

• Pushing towards a **streamlined technical applications portfolio** for greater efficiency and clarity of purpose.

• Increasing our capabilities to be able to achieve **delivery excellence**.

• **HSE** aspects remain one of our top concerns in all activities.
Thank you