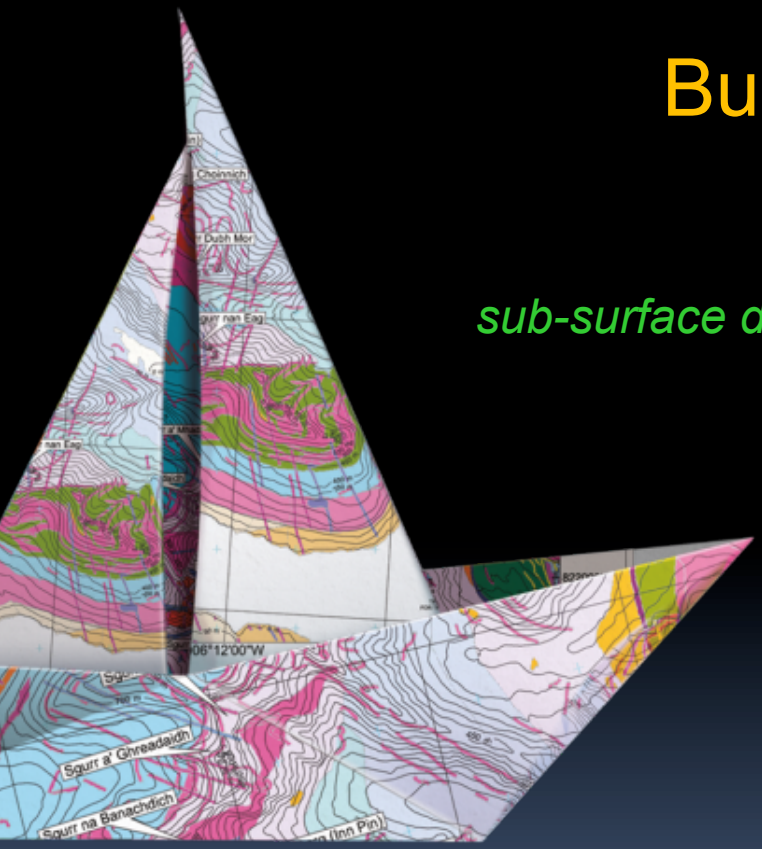
Master Data Management

Building MDM from the ground up

Case study: implementation of improved sub-surface data management / mastering for SE Asian Operator



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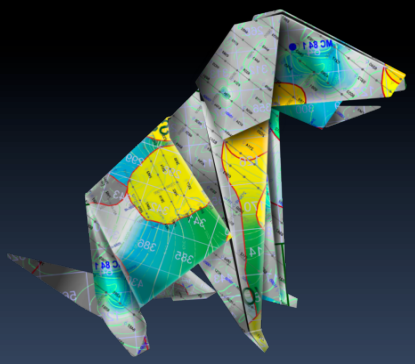
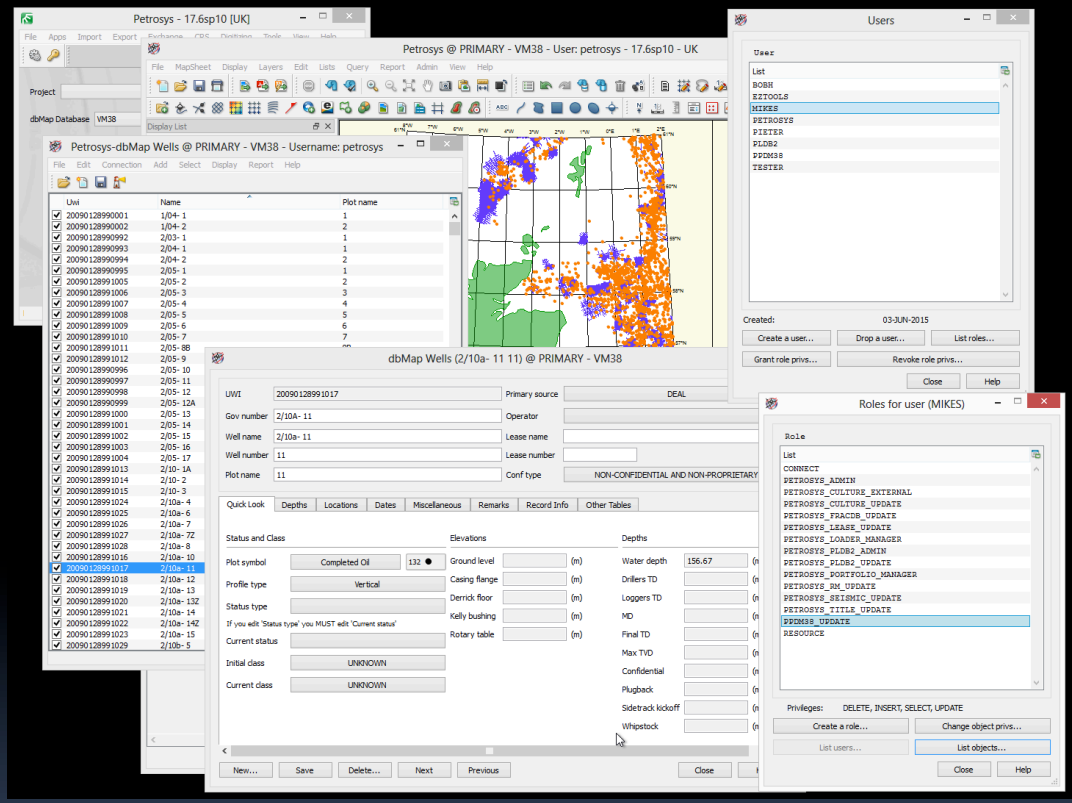
MDM – Business drivers

- **Petronas** compliance:
  - Master/Reference database
  - Improve data management
    - ✓ Data security
    - ✓ Data accessibility
    - ✓ Data trustworthiness
    - ✓ Data versioning
    - ✓ Data replication
  - Financial/Status reporting





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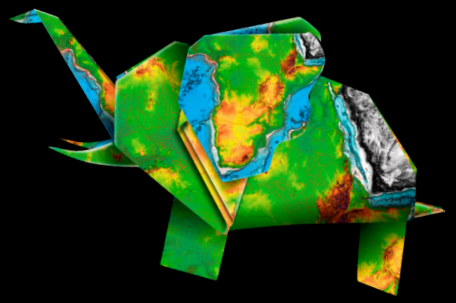
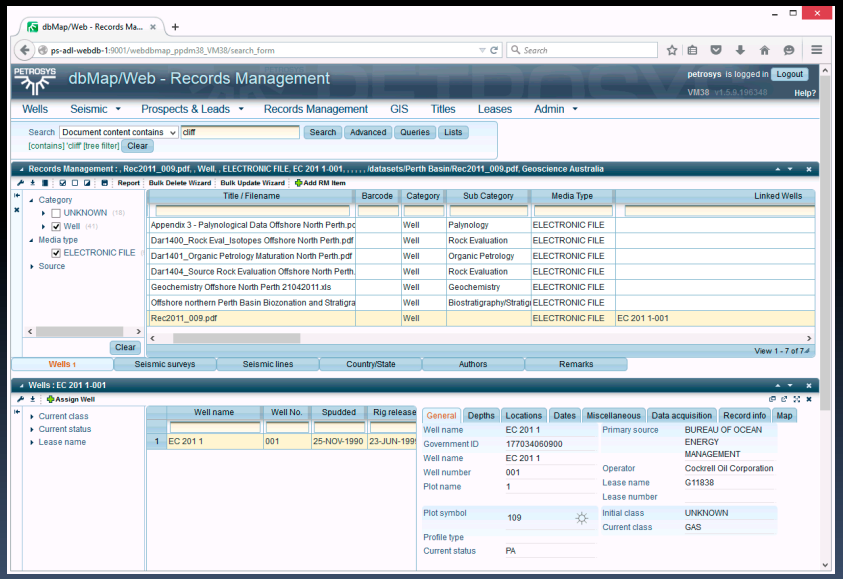
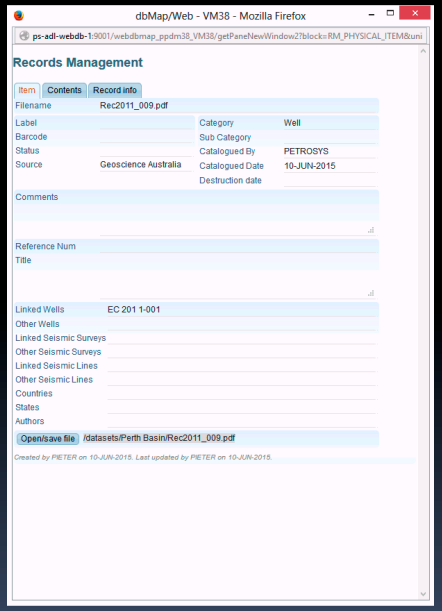
MDM – Business drivers

- In-house Data challenges:
  - Availability – data is stored across disks, people, systems
  - Use – finding the right data
  - Quality – finding the correct data
  - Consistency – using the same data (across disciplines)
  - Relevance – associating/relating data from different sources
  - Retrieval – systems performance, data volumes







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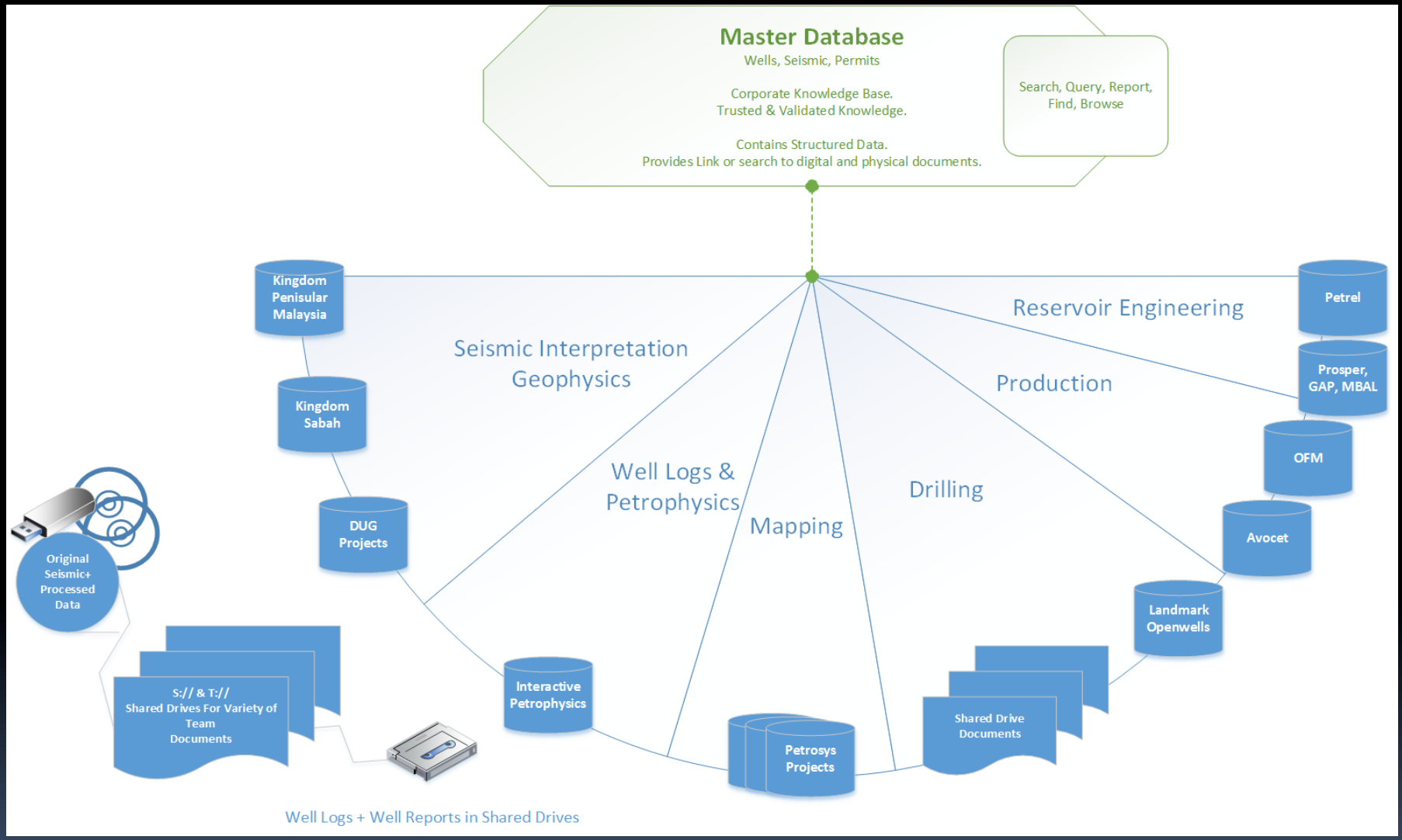
Master Data Management



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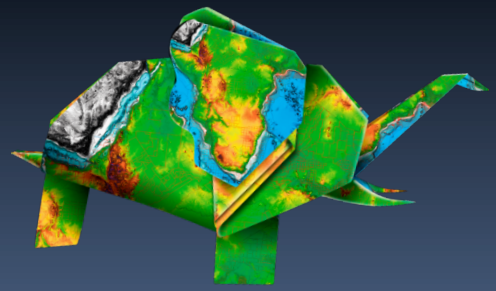
Building a Master Database

- Set up Infrastructure:
  - Database Server
  - Database Management System
  - Database = **PPDM**
    - ✓ Non-proprietary 'Open database'
    - ✓ Industry 'standard' (normalised & relational structure)
    - ✓ Widely understood/supported
  - Networking
    - Make database available to all
    - Make unstructured data available to database

- Set up data import/export Technology



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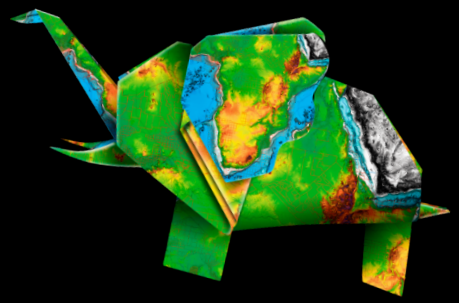
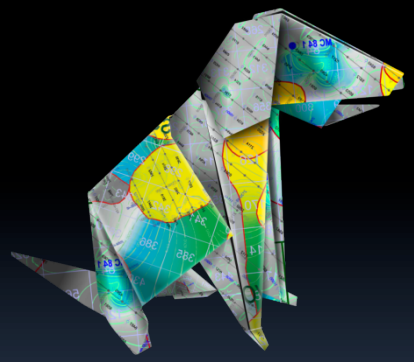
Building a Master Database

- Set up data management processes (*Note):
  - Create business rules
  - Manage Reference data
  - Manage/remove duplication
  - Clean up bad data
  - Quantify data confidence & quality
  - Manage data cohesiveness
  - Link database data with unstructured external data
  - Index documents for content search purposes





**Note: Automate business processes where possible*

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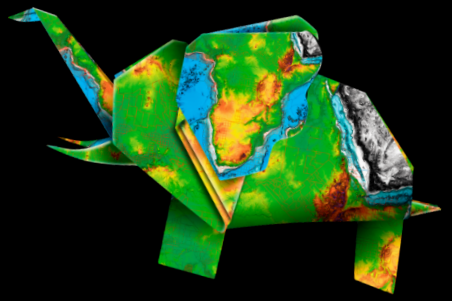
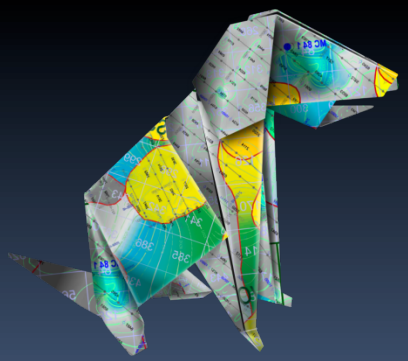
Building a Master Database

Specific mention: improving data quality over time



- Data Confidence / Quality Indicator:
  - Indicators with a Confidence and Quality component
  - Confidence rating is set manually
  - Quality rating should be set automatically, using Business Rules
  - Quality rating reports:
    - Highlight anomalies (between real and calculated quality rating)
    - Highlight reasons for lower-than-optimal quality rating
  - Confidence and Quality stored in one Column:



C/Q	R	Description
1H	1	High confidence / High quality
1M	2	High confidence / Medium quality
1L	3	High confidence / Low quality
2H	4	Medium confidence / High quality
2M	5	Medium confidence / Medium quality
2L	6	Medium confidence / Low quality
3H	7	Low confidence / High quality
3M	8	Low confidence / Medium quality
3L	9	Low confidence / Low quality

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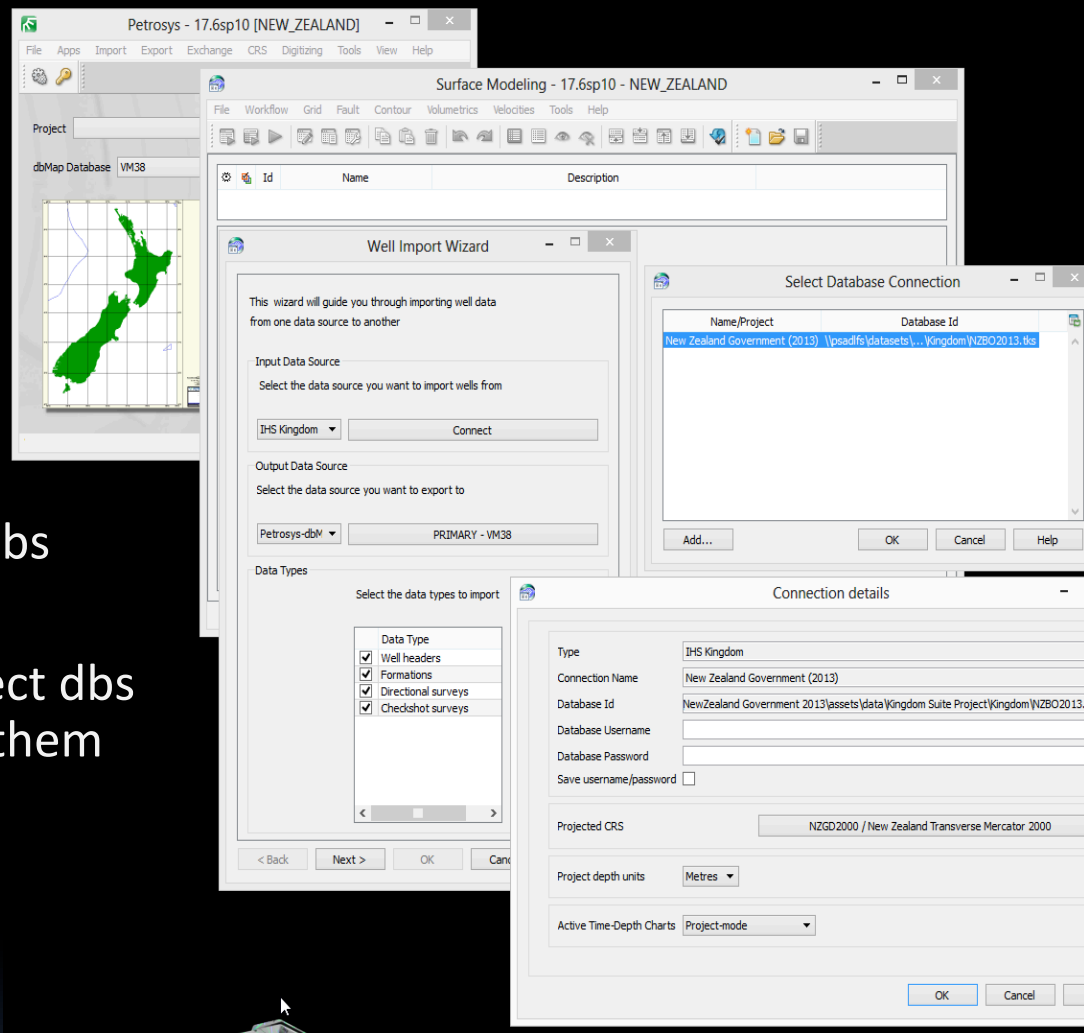
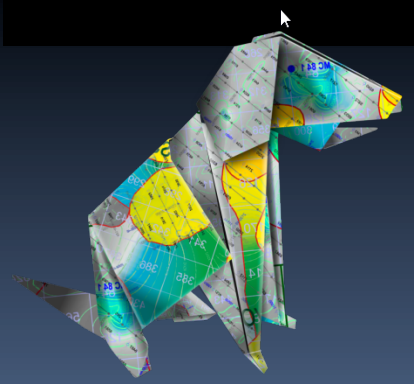
MDM at Work

Phase 1: initial data loading

- We set up dev, test, and prod dbs
- We set up data staging areas
- We connected to working project dbs and loaded data directly from them
- We loaded Spreadsheet data
- We loaded Shapefile data
- We manipulated data (following the business rules)





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MDM at Work

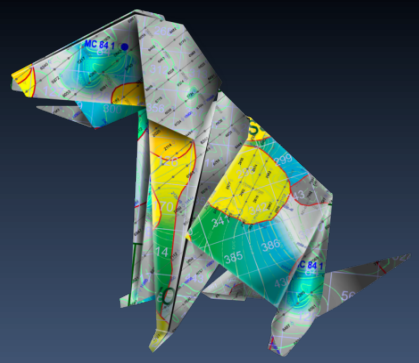
Phase 2: the database in use

- New data is loaded from original source:
  - Well Completion Reports
  - Engineering Reports
  - SEGY Files
  - Shapefiles
  - Etc.

- Data Quality is improved over time:
  - Reports highlight Quality rating
    → data is checked; records are updated.
  - More people see the same data
    → data is corrected in the one place.

- Data is viewed in real time
  - On Desktop Panels and Mapping systems
  - In Web Browsers

- Data is exported, queried, and reported.



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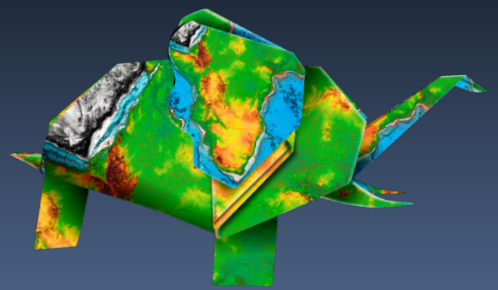
MDM at Work

Immediate Business Outcome:

“Centralised Data”

- Most Project data was loaded
- Culture data was loaded
- Leases/Permits were loaded
- Spreadsheet data was loaded into RM
- Set Confidence & Quality indicators
- Implemented unstructured data search:
  - about 650 thousand documents
  - about 45 million words
- Linked unstructured data where possible



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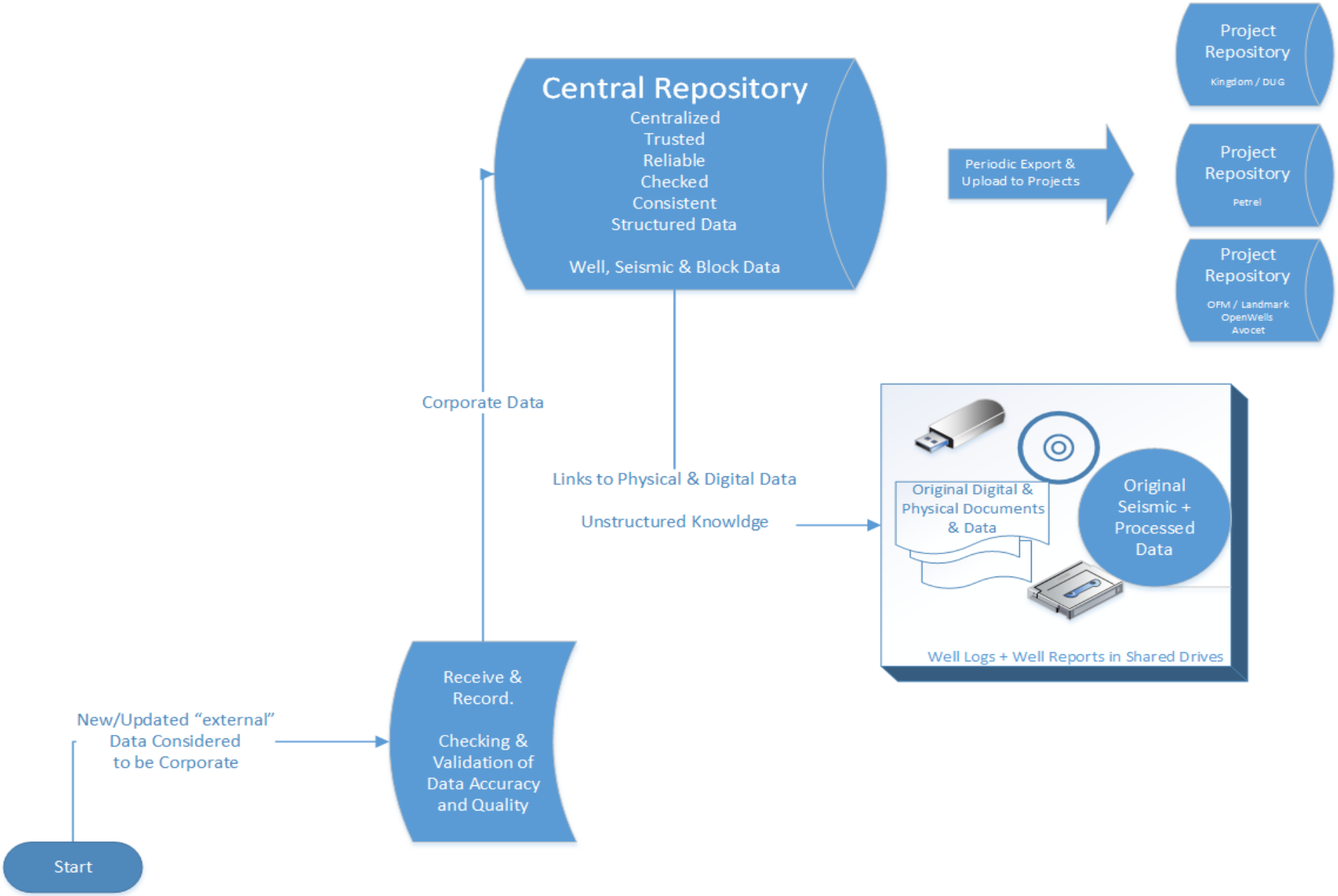
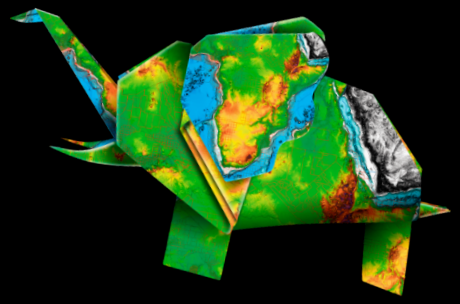
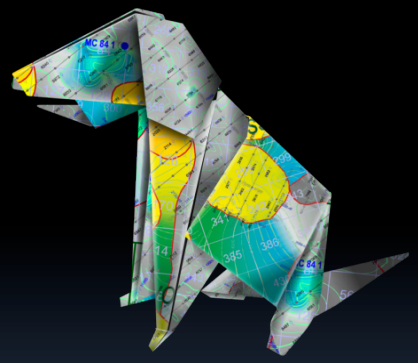

Central Repository
Centralized
Trusted
Reliable
Checked
Consistent
Structured Data
Well, Seismic & Block Data
Project Repository
Kingdom / DUG
Project Repository
Petrel
Project Repository
OFM / Landmark
OpenWells
Avocet
Periodic Export & Upload to Projects
Corporate Data
Links to Physical & Digital Data
Unstructured Knowldge
Original Digital & Physical Documents & Data
Original Seismic + Processed Data
Well Logs + Well Reports in Shared Drives
Receive & Record.
Checking & Validation of Data Accuracy and Quality
New/Updated "external" Data Considered to be Corporate
Start

MDM – Sharing experiences

Lessons learned



- Communicate, communicate, communicate
- People input should be organised at outset
- Fix what you can, live with what you can't immediately fix
- Formalise processes to improve data quality
- Implement in stages:
  - Work in Development, Test, and Production environments
  - Use data staging areas – i.e. temporary tables, databases
- Don't be afraid to start again
- Be flexible with technology – anything goes



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Thank you for your time

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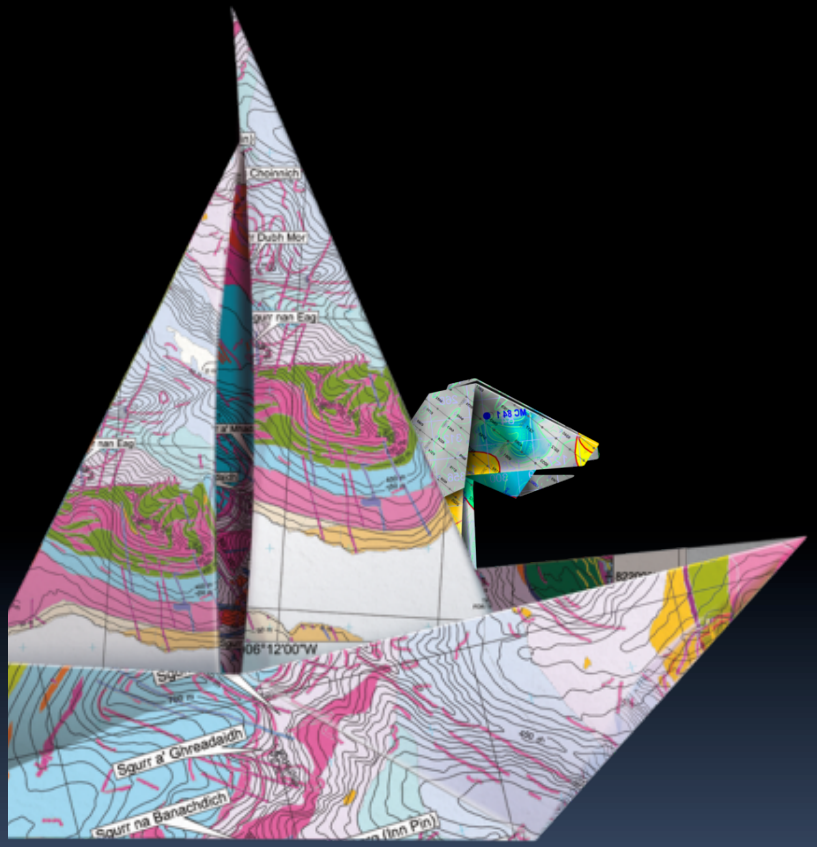

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