Master Data Management

Building MDM from the ground up

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

Rob Bruinsma
rob@petrosys.com.au
Senior Database Analyst / Administrator
Middle East, Asia, and Pacific

Deano Maling
Deano.Maling@lundinmalaysia.com
Subsurface Data Manager
Kuala Lumpur, Malaysia
MDM – Business drivers

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

The diagram depicts the current Lundin system state, grouped by technical discipline. This is a logical diagram (rather than depicting the physical state of the IT infrastructure itself).
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
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
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:

<table>
<thead>
<tr>
<th>C/Q</th>
<th>R</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1H</td>
<td>1</td>
<td>High confidence / High quality</td>
</tr>
<tr>
<td>1M</td>
<td>2</td>
<td>High confidence / Medium quality</td>
</tr>
<tr>
<td>1L</td>
<td>3</td>
<td>High confidence / Low quality</td>
</tr>
<tr>
<td>2H</td>
<td>4</td>
<td>Medium confidence / High quality</td>
</tr>
<tr>
<td>2M</td>
<td>5</td>
<td>Medium confidence / Medium quality</td>
</tr>
<tr>
<td>2L</td>
<td>6</td>
<td>Medium confidence / Low quality</td>
</tr>
<tr>
<td>3H</td>
<td>7</td>
<td>Low confidence / High quality</td>
</tr>
<tr>
<td>3M</td>
<td>8</td>
<td>Low confidence / Medium quality</td>
</tr>
<tr>
<td>3L</td>
<td>9</td>
<td>Low confidence / Low quality</td>
</tr>
</tbody>
</table>
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)
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.
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
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
Thank you for your time

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

Deano Maling
Deano.Maling@lundinmalaysia.com
Subsurface Data Manager
Kuala Lumpur, Malaysia

Rob Bruinsma
rob@petrosys.com.au
Senior Database / Administrator
Middle East, Asia, and Pacific