Independent Data Services

a Schlumberger partner company

Automated Reporting and One Version of the Truth in an Open World

John Hanson, IDS, Sep 2019
IDS – who are we?

- **1995**: Founded - providing a ‘Drilling Data Package’ for daily reporting
- **2001**: Switched to web-delivered online reporting services - ‘DataNet’
- **2015**: Rewritten as DataNet2.5 – HTML5, full mobile capabilities
- **2016**: Introduce ‘Lean Automated Reporting’ initiative
- **2019**: ACRE - Automated Common Reporting Environment for Operators + Drilling Contractors

Today

- Approximately **70 employees** worldwide, majority in app and core development
- **Offices** in Aberdeen, Calgary, Kuching, Singapore.
- **Over 200 clients** in 24 years of operation
60+ operating clients across Operators and Drilling Contractors

- Shell (PoC)
- BP (PoC)
- PDO (in collaboration with Schlumberger)
- OMV (19 years)
- Suncor (12 years)
- Repsol-Sinopec (ex Talisman, 21 years)
- Woodside (20 years)
- Premier Oil (20 years)
- Aker-BP
- Wintershall-DEA
- Centrica

- Noble Drilling (7 years)
- Borr Drilling
- Stena Drilling
Daily Reporting

...a manual process....
Conventional Report

**DDR Data Type**
- Basic Well Data
- Activities
- BHA
- Bits
- Casing and Cementing
- Drilling Parameters
- Formation Tops
- Fluid properties
- Fluid Volumes
- Rig Pumps
- Surveys
- Weather and Environment
- HSE
- Bulk Stocks
- Personnel on Board (PoB)
- Rig information

**Data Source**
- Well plan
- Manual (collaborative) entry

---

<table>
<thead>
<tr>
<th>FME</th>
<th>CLS</th>
<th>GP</th>
<th>P</th>
<th>PRK</th>
<th>DEPTH</th>
<th>ACTIV</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>P</td>
<td>B1</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H2</td>
<td>P</td>
<td>D1</td>
<td>1</td>
<td>0</td>
<td>50.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H3</td>
<td>P</td>
<td>D1</td>
<td>0</td>
<td>0</td>
<td>80.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H4</td>
<td>P</td>
<td>D2</td>
<td>1</td>
<td>0</td>
<td>90.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H5</td>
<td>P</td>
<td>D2</td>
<td>0</td>
<td>0</td>
<td>100.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H6</td>
<td>P</td>
<td>D3</td>
<td>1</td>
<td>0</td>
<td>110.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H7</td>
<td>P</td>
<td>D3</td>
<td>0</td>
<td>0</td>
<td>120.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H8</td>
<td>P</td>
<td>D4</td>
<td>1</td>
<td>0</td>
<td>130.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H9</td>
<td>P</td>
<td>D4</td>
<td>0</td>
<td>0</td>
<td>140.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H10</td>
<td>P</td>
<td>D5</td>
<td>1</td>
<td>0</td>
<td>150.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H11</td>
<td>P</td>
<td>D5</td>
<td>0</td>
<td>0</td>
<td>160.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H12</td>
<td>P</td>
<td>D6</td>
<td>1</td>
<td>0</td>
<td>170.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H13</td>
<td>P</td>
<td>D6</td>
<td>0</td>
<td>0</td>
<td>180.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H14</td>
<td>P</td>
<td>D7</td>
<td>1</td>
<td>0</td>
<td>190.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H15</td>
<td>P</td>
<td>D7</td>
<td>0</td>
<td>0</td>
<td>200.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H16</td>
<td>P</td>
<td>D8</td>
<td>1</td>
<td>0</td>
<td>210.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H17</td>
<td>P</td>
<td>D8</td>
<td>0</td>
<td>0</td>
<td>220.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H18</td>
<td>P</td>
<td>D9</td>
<td>1</td>
<td>0</td>
<td>230.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H19</td>
<td>P</td>
<td>D9</td>
<td>0</td>
<td>0</td>
<td>240.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H20</td>
<td>P</td>
<td>D10</td>
<td>1</td>
<td>0</td>
<td>250.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>H21</td>
<td>P</td>
<td>D10</td>
<td>0</td>
<td>0</td>
<td>260.00</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

---

Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry

---

**Data Source**
- Well plan
- Manual (collaborative) entry
Money and time wasted gathering data...

- At the Rig...
  - Manual data gathering
  - Manual data entry
  - Import from 3\textsuperscript{rd} party Excel

Each DDR represents in US$250+ and 1.5 hrs direct acquisition/input cost and lost key man time each day

And reprocessing it...

“....On average, a BHA report or a mud report are generated and re-typed three or four times each day at the rig..
FTR – Fixed Text Remarks
• Engineer required to enter Specific data

• Formatted output

• Aligned to Performance codes
  ▪ Data input requirements change
How do we get to LAR (Lean Automated Reporting)?
The WITSML-powered Lean Report

**DDR Data Type**
- Basic Well Data
- Activities
- BHA
- Bits
- Casing and Cementing
- Drilling Parameters
- Formation Tops
- Fluid properties
- Fluid Volumes
- Rig Pumps
- Surveys

**Data Source**
- Well plan
- WITSML data

**WITSML Store**
- Rig systems
- Collaborative entry
The Filebridge-powered Lean Report

**DDR Data Type**

- Basic Well Data
- Activities
- Fluid Volumes
- Rig information

**Data Source**

- Well plan

**Service Co Report**

- BHA/ bit report
- Casing Tally
- Cmt Report
- Formation Data
- Mud Report
- Rig Pumps
- Surveys
- Bulk Stocks Report
- PoB

**FileBridge**

- Collaborative entry

**Basic Well Data**

- BHA
- Bits
- Casing and Cementing
- Formation Tops
- Fluid properties
- Fluid Volumes
- Rig Pumps
- Survey
- Bulk Stocks
- PoB

**Weather and Environment**

- HSE
*ACTIVITIES – The most important part of the report...

~30% of the real estate
~65% of the effort
~90% of the value
~100% re-used*
WITSML 1.4.1.1
1. well
2. wellbore
3. bhaRun
4. tubular
5. fluidsReport
6. opsReport
7. formationMarker
8. log
9. mudLog
10. wbGeometry
11. trajectory
12. Attachment
13. CementJob
14. Risk Object

Rig State source data from WITSML ‘Log’ object

1. Date and time (hh:mm:ss)
2. Depth Bit (meas)
3. Depth Hole (meas)
4. Rotary Torque (surface)
5. Rotary/top drive RPM (surface)
6. Motor/turbine RPM (downhole)
7. Hook position
8. Standpipe Pressure (avg)
9. Hookload (avg)
10. Weight-on-bit (surf,avg)
11. Mud Flow rate in
12. Pump Stroke Rate # 1
13. Pump Stroke Rate # 2
14. Pump Stroke Rate # 3

WITSML 2.0
Waiting on uptake
# IDS OSD (Operational State Detection)

<table>
<thead>
<tr>
<th>Rig State</th>
<th>IDS Op State Description</th>
<th>Rig State</th>
<th>IDS Op State Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drilling</td>
<td>23</td>
<td>Rotating</td>
</tr>
<tr>
<td>2</td>
<td>Tripping In</td>
<td>24</td>
<td>Circulating while Reciprocating</td>
</tr>
<tr>
<td>3</td>
<td>Tripping Out</td>
<td>28</td>
<td>In Slips - Trip Out</td>
</tr>
<tr>
<td>4</td>
<td>Circulating</td>
<td>29</td>
<td>Back Reaming</td>
</tr>
<tr>
<td>5</td>
<td>Casing Run</td>
<td>30</td>
<td>Reaming Down</td>
</tr>
<tr>
<td>10</td>
<td>Surface</td>
<td>31</td>
<td>In Slips - Casing</td>
</tr>
<tr>
<td>12</td>
<td>Rotary Drilling (Surface and DH)</td>
<td>35</td>
<td>Pump Off - In slips</td>
</tr>
<tr>
<td>13</td>
<td>Turbo Drilling</td>
<td>36</td>
<td>Connection - In Slips</td>
</tr>
<tr>
<td>14</td>
<td>Sliding Drilling</td>
<td>38</td>
<td>Weight to Weight</td>
</tr>
<tr>
<td>15</td>
<td>Connection</td>
<td>40</td>
<td>Weight to Slip</td>
</tr>
<tr>
<td>17</td>
<td>Circulating Static</td>
<td>41</td>
<td>Slip to Weight</td>
</tr>
<tr>
<td>18</td>
<td>Wash Down</td>
<td>42</td>
<td>Slips to Slips - Trip In</td>
</tr>
<tr>
<td>19</td>
<td>Pump out of hole</td>
<td>43</td>
<td>Slips to Slips - Trip Out</td>
</tr>
<tr>
<td>20</td>
<td>Cut/Slip Drill line</td>
<td>44</td>
<td>Slips to Slips - Casing</td>
</tr>
<tr>
<td>22</td>
<td>In slips - Trip-In</td>
<td>45</td>
<td>Rotary Drilling (Surface)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47</td>
<td>Casing Block Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>Pipe Handling Delays</td>
</tr>
</tbody>
</table>

*mt = minimum threshold

Under development...

- a. Rig move
- b. Anchoring
- c. Rig up/down (Rig)
- d. Handling tools (types)
- e. Rig-up down
ILT and Data QC derived from LAR

24 Hrs Operations On Sunday, November 13, 2016

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Hours</th>
<th>IADC Code</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>06:00</td>
<td>6.00</td>
<td>2</td>
<td>Drilled 12 ¼&quot; hole section from depth 594 m to 645 m with controlled parameters. Wash up &amp; Ream down one single each stand drilled. No DH losses.</td>
</tr>
<tr>
<td>06:00</td>
<td>06:15</td>
<td>0.25</td>
<td>21</td>
<td>Hold PJSM. Discussed, Hand &amp; finger injury, Use compressed air, Slip, Trip and Fall, Loading Unloading Chemicals.</td>
</tr>
<tr>
<td>06:15</td>
<td>18:00</td>
<td>11.75</td>
<td>2</td>
<td>Drilled 12 ¼&quot; hole section from depth 645 m to 732 m with controlled parameters. Wash up &amp; Ream down one single each stand drilled. No DH losses.</td>
</tr>
<tr>
<td>18:00</td>
<td>18:15</td>
<td>0.25</td>
<td>21</td>
<td>Hold PJSM. Discussed, Hand &amp; finger injury, Use compressed air, Slip, Trip and Fall, Loading Unloading Chemicals.</td>
</tr>
<tr>
<td>18:15</td>
<td>23:30</td>
<td>5.25</td>
<td>2</td>
<td>Drilled 12 ¼&quot; hole section from depth 732 m to 778 m with controlled parameters. Wash up &amp; Ream down one single each stand drilled. No DH losses.</td>
</tr>
</tbody>
</table>

LAR (ILT Analysis):
Drill 12.25” hole : 22.48 hrs (DDR: 23.0 hrs)
PJSM +TDS : 0.60 hrs (DDR: 1.0 hrs)
Pipe Handling : 0.92 hrs
Total ILT = : 0.92hrs

LAR (QC):
Service TDS : DDR – 30 mins 23.30-00.00 hrs
Service TDS : LAR – 16 mins, 23:10-23:26

DDR (manual entry):
Drill 12.25” hole : 23.0 hrs
PJSM : 0.5 hrs
Service TDS : 0.5 hrs
LAR – lean automated reporting
Thank You