A Perspective on Digitalisation in the Oil and Gas Industry

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The Malaysian O&G industry is matured and has a well-established services supply chain.

Developments over the last 40 years:

- 105 PSCs and 4 RSCs
- 603 kboed liquid production
- 6,120 mmscf/d natural gas production
- 23.2 bil boe discovered resources
- 8,467 km pipeline
- 332 platforms

Source: Petronas, Global Data
However, the global O&G industry today is facing a new normal of ‘lower for longer’ oil prices

- Competition from shale oil production in the US
- Alternative fuel sources such as renewables gaining more traction
- Policy-making pivots by some Governments to encourage the use of cleaner energy sources
- The drive for energy efficient vehicles among auto makers
In adjusting to the era of lower oil prices, the industry has to rethink their operating models.

Impact from low oil prices

- Operators CAPEX are reduced, production from existing brownfield assets continue, downstream investments continue.
- Service providers must adjust to this reprioritisation of projects.
- Cost competitiveness is the name of the game across the value chain.
Digital technology can be game-changing to help O&G companies improve competitiveness and cost efficiency

**Technology** | **Example of application in Oil & Gas**  
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Artificial Intelligence |  
- **Unmanned Operations/ Minimum Intervention**  
  - AI enables self-aware platforms e.g. robotics manipulations based on weather conditions  
  - Reduce cost and HSE risks for sending personnel to remote platforms  
- **Inspection and Surveying**  
  - Drones for flare-tip inspections replaces manual inspection  
  - Reduce shutdown time and safety risks e.g. scaffolding  
- **Predictive Maintenance**  
  - BDA enables high accuracy prediction through physics based modeling + machine learning  
  - Eliminate production lost due to unplanned shutdown of rotating equipment (pumps, motors, turbines)  
- **Wells, reservoirs and facility management**  
  - Provides early and actionable warnings of impending equipment and process problems  
  - Faster and real-time decision making  
Big Data Analytics |  
Internet-of-Things |
Challenges impeding digital technology adoption:

**Data**
- Complexity - Data pool is too vast, stored in a fragmented systems, (various systems - various formats, various database)
- Integrity and Security – reliability of data

**Infrastructure**
- Remote connectivity – platforms up to 150kms from shore

**People**
- Buy-in – willingness to invest in digital technology
- Talent – data scientists, digital domain experts
Digital players can partner with O&G service providers to achieve synergies in providing end-to-end solutions.

### Value Chain of Upstream Oil & Gas (RM50bn turnover – 2015)

<table>
<thead>
<tr>
<th>Exploration</th>
<th>Development</th>
<th>Production</th>
<th>Decom</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seismic survey</td>
<td>Engineering Consultancy</td>
<td>Operations and maintenance services</td>
<td>Transportation services</td>
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<tr>
<td>Field development</td>
<td>Geomatic Services</td>
<td>Engineering and project management</td>
<td>Warehousing and storage</td>
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<td>Reservoir mgmt</td>
<td>Platform Fabricators</td>
<td>Equipment maintenance</td>
<td>Marine vessel services</td>
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<td></td>
<td>Offshore Constructions</td>
<td>Underwater services</td>
<td>Cargo tankers</td>
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<td>FPSO</td>
<td>Equipment maintenance</td>
<td>Environmental &amp; waste disposal</td>
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<td></td>
<td>Subsea</td>
<td>Asset Integrity services</td>
<td>Decommissioning contractors</td>
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<td>Drilling Rigs/Services</td>
<td>HSE and security</td>
<td>Well plugging</td>
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<td></td>
<td>Well</td>
<td>Transportation services</td>
<td>Structure</td>
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<tr>
<td></td>
<td>Services</td>
<td></td>
<td>Machinery &amp; equipment</td>
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<td>Completions</td>
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- 50 companies
- 600 companies
- 950 companies
- 100 companies
- 700 companies
The Government has introduced pro-innovation policies and initiatives to encourage adoption of digital technologies.
Key takeaways

- O&G downturn opens opportunities for new ways and applications.
- Opportunity for digital and ICT players to partner and leverage OGSE players industry know-how to develop digitally enabled innovation projects to address industry challenges.
- Visit [http://mprc.gov.my](http://mprc.gov.my) to find out more about our innovation and technology initiatives and link up with Malaysian OGSE players.
Thank You